Dec. 22, 1953 S. MORRISON 2,663,468

SIFTER CAP DEVICE FOR DISPENSING CONTAINERS

Filed March 9, 1950

Fig. 1.

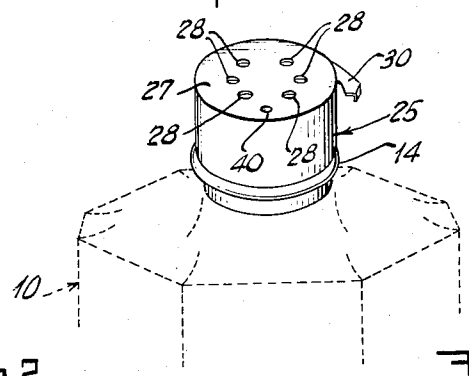


Fig. 2.

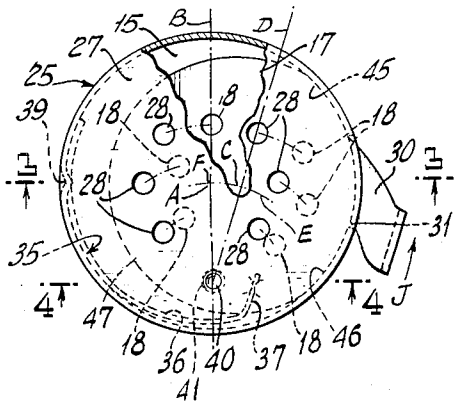


Fig. 5.

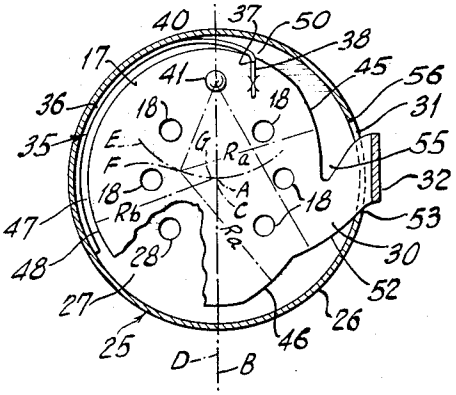


Fig. 3.

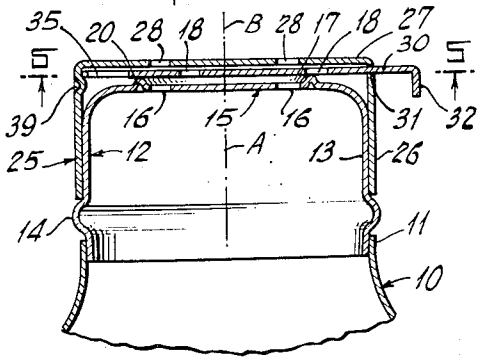
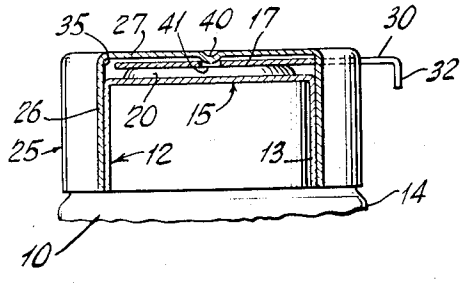


Fig. 4.



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SIFTER CAP DEVICE FOR DISPENSING CONTAINERS

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4 Claims. (Cl. 222—517)

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The present invention relates to containers for pulverulent or finely divided flowable material such as talc powder, dentifrice, condiments and the like, and more particularly to sifter cap devices associated with these containers for dispensing purposes.

There have been proposed for the purpose indicated sifter cap devices having spring-pressed self-closing perforated slide valve discs or plates, but these devices have been comparatively complicated, costly in construction and hard to assemble, and/or have involved parts, such as springs, projecting inwardly towards the container and interfering thereby with the free flow of the fine material to the perforations of the valve discs during dispensing operations. Moreover, certain of these prior sifter devices have been so constructed that the fine material in the container finds its way readily to the slide part in a way to interfere with the free movement of this part into and out of sifting position. Where the slide part is located on the outer end of the sifter device to avoid this condition, the resulting substantially complete exposure of this part makes it necessary to use a special spring, such as a coil spring, and requires this to be enclosed in a special housing, thereby adding to the complication of the device and to its cost of manufacture.

One object of the present invention is to provide a new and improved container sifter device of the spring-pressed, self-closing, slide valve type, which is comparatively simple in construction, inexpensive to manufacture and easy to assemble, which can be easily manipulated into dispensing position with a minimum of finger pressure without jamming, which offers no obstruction to the flow of the fine material to the dispensing perforations of the valve, and which is constructed to house the valve and to protect it against the jamming action of the material being dispensed.

Various other objects of the invention are apparent from the following particular description and from an inspection of the accompanying drawings, in which:

Fig. 1 is a perspective of a container having a sifter cap device embodying the present invention;

Fig. 2 is a top plan view of the sifter cap device shown with the cover broken away to reveal the perforated slide valve in closed position;

Fig. 3 is a longitudinal section of the sifter cap device taken on the lines 3—3 of Fig. 2;

Fig. 4 is a section of the sifter cap device taken on the lines 4—4 of Fig. 2; and

Fig. 5 is a transverse section of the sifter cap device taken on lines 5—5 of Fig. 3, but showing the perforated slide valve in open sifting position.

Referring to the drawings, the sifter device of the present invention is attached to a suitable

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container 10 for a material fine enough to flow through perforations in the device when said container is inverted and said device is manipulated into open dispensing position. The container 10 may be a can, jar, box or bottle as shown and is provided with the usual discharge neck 11 to which the sifter device of the present invention is attached.

The sifter device of the present invention comprises a head 12 in the form of an inverted generally cylindrical cup having a peripheral depending skirt or flange 13 retained in the neck 11 of the container 10 by a friction fit and having a peripheral rib or head 14 resting on the upper edge of said neck.

This head 12 has an end wall 15 with a series of perforations 16, six of them being shown, arranged symmetrically about the diametrical axis center A of said wall and on opposite sides of a transverse plane B at right angles to the plane of said wall. Seated on this end wall 15 is a slide valve disc 17 which is provided with perforations 18 corresponding to respective perforations 16 on said end wall and symmetrically arranged about an axis center C and on opposite sides of a transverse plane D. This valve disc 17 is adapted to be moved slidably edgewise to bring its perforations 18 into and out of registry with the perforations 16 in the end wall 15 of the head 12. An annular rib 20 on the end wall 15 of the head 12 concentric with the axis A of said head serves as a seat for the valve disc 17 in this slide movement, thereby reducing friction resulting from this movement to a minimum.

Telescoped over the head 12 and over the valve disc 17 is a cover 25 in the form of an inverted generally cylindrical cup having a peripheral depending skirt or flange 26 retained over said head with a friction fit. This cover 25 has an end wall 27 provided with perforations 28 corresponding to and in registry with the perforations 16 respectively in the end wall 15 of the head 12. The valve disc 17 is housed between the end cover wall 27 and the end head wall 15 and has a tongue extension 30 passing through a slot 31 in the upper part of the skirt 26 and terminating in a flange 32 serving as a thumb piece by which said valve disc may be manipulated into open dispensing position, with its perforations in registry with the perforations 16 and 28.

The sifter device is of the self-closing spring-pressed type. For urging the valve disc 17 into closed position, there is provided a spring wire 35 shown of round stock, although as far as certain aspects of the invention are concerned, it may be of flat stock. This spring wire 35 has a resilient body section 36, which in unstressed unassembled condition of the wire is straight, and an offset anchoring section 37 at one end, which in this condition of the wire extends at a suitable obtuse

angle with respect to said body section, as for example 150°. This end wire section 37 is anchored to the valve disc 17 by snug retention in a slender notch 38 in said disc and is fixed therein, as for example, by peening on opposite sides of said notch to upset the disc metal into firm gripping engagement with said wire section (Fig. 5).

In assembled condition, with the end 37 of the spring wire 35 secured to the valve disc 17, the body section 36 is flexed into substantially conforming engagement with the inner periphery of the skirt 26 of the cover 25 and around the periphery of said disc. This spring wire 35 thereby is retained substantially in the plane of the body portion of the valve disc 17 on one side of the cover 25, and the tendency for the anchored end section 37 of said wire to assume its obtuse angular relationship described, with respect to the body section 36 of said wire, urges the valve disc to roll somewhat along the inner periphery of the cover skirt 26 towards the opposite side of the cover into the closed position shown in Fig. 2. To assume retention of the spring wire 35 in this plane, especially at its free end, the skirt 26 of the cover 25 near said end is punched to form a small inwardly extending protuberance 39 underlying and giving support to said spring wire (Fig. 3).

The valve disc 17 is constrained to slide edgewise angularly about a fixed axis near the anchored section of the spring wire 35. For that purpose, the end cover wall 27 has an inward projection 40 near one side extending permanently into a hole 41 in the valve disc 17 and forming thereby a pivot for said valve disc. This pivot is disposed at the intersection of the plane B of symmetry of the fixed perforations 16 and 28 in the head end wall 15 and cover end wall 27 and the plane D of symmetry of the perforations 18 in the valve disc 17, as shown in Figs. 2 and 5. The perforations 18 on the valve disc 17 are located with respect to this pivot 40 at distances equal to respective distances of corresponding pairs of fixed aligned perforations 16 and 28 from said pivot, to bring these perforations 18 into registry with the corresponding perforations 16 and 28, when said disc is moved about said pivot from closed position of said disc shown in Fig. 2 to open dispensing position shown in Fig. 5.

The axis C of symmetry of the series of perforations 18 of the valve disc 17 and the axis A of the fixed walls 15 and 27 are located on an arc E of the pivot 40, as shown in Fig. 5. The axis C of symmetry of the perforations 18 of the valve disc 17 thereby moves into coincidence with the axis A of the fixed walls 15 and 27 when said valve disc is moved angularly about the pivot 40 from the extreme closed position shown in Fig. 2 to the extreme open position shown in Fig. 5.

For locating the valve disc 17 accurately in extreme closed position shown in Fig. 2, the edge sections 45 and 46 of said disc on opposite sides of the tongue 30 are arcuately curved about an axis F on the arm E at a radius R_a equal or just slightly smaller than the internal radius of the skirt or flange 26 of the cover 25, as shown in Fig. 5. Therefore, in the extreme closed position, shown in Fig. 2, the edge sections 45 and 46 of the valve disc 17 will be pressed under the influence of the spring wire 35 against the inner periphery of the skirt or flange 26 of the cover 25 in conformable engagement therewith, while the axis F on said disc will be coincident with the axis A of the fixed walls 15 and 27.

For locating the valve disc 17 accurately in extreme open or dispensing position shown in Fig. 5, the edge section 47 of said valve disc diametrically opposite the tongue 30 and between the disc limiting edge sections 45 and 46 is arcuately curved about a point G on the arc E at a radius R_b smaller than the internal radius of the skirt or flange 26 of the cover 25, as shown in Fig. 5. Therefore, in the extreme open dispensing position shown in Fig. 5, the edge section 47 of the valve disc 17 will be separated from the inner periphery of the cover skirt or flange 26 by a space 48, to receive comfortably the spring wire 35. The point G is spaced a small distance from the axis C of symmetry of the perforations 18 of the valve disc 17, so that the space 48 is wider in the region 50 where the body portion 36 of the spring wire 35 extends from its anchorage in said valve disc, and where such additional width is required.

The pivot mounting of the valve disc 17 through the projection 40 on the cover wall 27 will direct said valve disc in its edgewise movement from closed spring-pressed position, shown in Fig. 2, to open dispensing position, shown in Fig. 5 as already described. However, to assure against the displacement of valve disc 17 out of pivot engagement with the projection 40 during this movement of the valve disc, the edge 52 of the tongue extension 30 is arcuately curved about the center of the disc hole 41 or pivot projection 40, and the corresponding edge 53 of the cover slot 31 is located a very small distance from said edge. Thereby, as the valve disc 17 is manipulated into open dispensing position shown in Fig. 5 by application of thumb pressure on the tongue 30, the edge 52 of said tongue moves across the cover slot edge 53 at least in close proximity thereto, and if the pivot connection between said disc and the cover wall 27 is loose enough, said tongue edge may actually ride across said cover slot edge in direct engagement therewith to be guided thereby.

The tongue 30 desirably extends in a general tangential direction with respect to the periphery of the valve disc 17 to define an acute corner 55 between said periphery and said tongue. The edge 56 of the cover slot 31 through which the tongue 31 projects extends into this disc corner 55, when the valve disc 17 is in the closed position shown in Fig. 2, under the influence of the spring wire 35, thereby serving as additional limiting means for said valve disc in case the pivot connection between said disc and the cover wall 27 is loose.

In operation, the tendency of the spring wire 35 to unfold about the angle connection between its sections 36 and 37 moves the valve disc 17 angularly about the pivot 40 into closed limited position shown in Fig. 2, with the perforations 18 on said disc out of registry with the fixed perforations 16 and 28 of the walls 15 and 27, and the edges 45 and 46 of said disc conformably engaging the inner periphery of the cover skirt 26. In the self-closed position of the valve disc 17, the tongue 30 projects outwardly to its full extent through the cover slot 31 in position easily accessible to the thumb of the hand holding the container 10.

When it is desired to move the valve disc 17 into open dispensing position, the tongue 30 is pushed with the thumb in the direction of the arrow J shown in Fig. 2 to swing said disc about the pivot 40 against the action of the spring wire 35 until the disc is moved against the skirt wall 26 of the cover 25 as far as said disc will go, as

shown in Fig. 5. In this position, the axis C of the valve disc will coincide substantially with the axis A of the cover and head walls 15 and 27 and the perforations 18 in said disc will be in registry with aligned perforations 16 and 28 in said walls. By inversion of the container 10, the powder contents of said container will be discharged through the registering perforations 16, 18 and 28.

Upon release of thumb pressure from the tongue 30, the valve disc 17 will automatically return under the unfolding action of the spring wire 35 into closed position shown in Fig. 2.

It should be noted that the sifter device of the present invention consists of a small number of simple parts, simply assembled together, and of such construction that they lend themselves to inexpensive manufacture by stamping and/or spinning operations. Moreover, the valve disc 17 is protectively housed between the head 12 and cover 25, so that the fine material in the container 10 does not find its way in any region to block said disc against slide movement. Furthermore, the spring wire 35 in no way interferes with the free flow of the fine material in the container 10 towards the registering perforations 16, 18 and 28 when the container is inverted.

Although the invention is shown in connection with the head 12, as far as certain aspects of the invention are concerned, this head can be eliminated, and other means can be provided to support slidably the valve disc 17. Or if desired, as far as certain aspects of the invention are concerned, the head 12 may be provided with an upper rim section to support the valve disc 17, and the end wall 15 on said head may be eliminated.

While the invention has been described with particular reference to a specific embodiment, it is to be understood that it is not to be limited thereto, but is to be construed broadly and restricted solely by the scope of the appended claims.

What is claimed is:

1. In a dispensing cap device for a container, the combination comprising a peripheral wall for one end of the container, an end wall for said container having a series of dispensing perforations, a valve disc provided with a series of dispensing perforations corresponding to said end wall perforations respectively and mounted for edgewise slide movement across the face of said end wall into and out of perforation registry with said end wall, said valve disc having a slot extending from the edge thereof, a spring wire arranged in the plane of said valve disc and having a body portion and an end anchoring portion at an angle with said body portion, said end anchoring portion being retained in said disc slot, said body portion being wrapped around the edge of said disc in stressed condition free from fixed connections and tending to spring away from the edge of said disc, the peripheral wall of the container serving as an abutment for the body portion of said spring wire to hold said body portion under stress and to cause thereby said valve disc to be urged resiliently into closed position out of perforation registry with said end wall.

2. In a dispensing cap device for a container, the combination comprising a peripheral wall for one end of the container, an end wall for said container having a series of dispensing perforations, a valve disc provided with a series of dispensing perforations corresponding to said end wall perforations respectively and mounted for edgewise slide movement across the face of said

end wall into and out of perforation registry with said end wall, and a spring wire having one end rigidly anchored to said valve disc near the edge thereof and having a body portion which in unstressed condition is substantially straight and extends away from the edge of said valve disc, said wire body portion in operative position being flexed within and along said peripheral wall in abutment thereto and being free from fixed attachment, said wire body portion when so flexed being stressed to move said valve disc edgewise out of perforation registry with said end wall, and a finger piece connected to said valve disc and projecting through a circumferential slot in said peripheral wall permitting manipulation of the valve disc against the action of said spring wire into perforation registry with said end wall.

3. In a dispensing cap device for a container, the combination defined in claim 2, characterized in that the spring wire in unstressed condition has a substantially straight body portion and a shorter end portion at an obtuse angle with respect to said body portion, and said end portion extends into a slot in the edge of the valve disc and is fixedly anchored therein, said wire body portion in operative position being flexed and wrapped in stressed condition around the edge of valve disc and along the inner side of the peripheral wall and in its tendency to straighten out urging said valve disc out of perforation registry with said end wall.

4. In a dispensing cap device for a container, the combination comprising a peripheral wall member for one end of said container having a slot extending circumferentially therealong, a fixed transverse end wall for said container having a series of dispensing perforations, a valve disc within said wall member provided with a series of dispensing perforations corresponding to said end wall perforations respectively and pivotally mounted off-center for edgewise slide movement across the face of said end wall into and out of perforation registry with said end wall, said valve disc having a tongue extension on one side of the pivotal mounting for the valve disc and passing through said slot and serving as a finger piece by which said valve disc may be manipulated into perforation registry with said end wall, and a spring wire in the plane of said valve disc having a body portion with a short angular end portion anchored to said disc, said body portion being wrapped around the edge of the disc in stressed condition free from fixed connections and tending to spring away from the edge of the disc, the peripheral wall member serving as an abutment for the body portion of the spring wire to hold said body portion under stress and to cause thereby said valve disc to be urged resiliently into closed position out of perforation registry with said end wall.

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