Feb. 12, 1952 H. K. DICKERMAN ET AL 2,585,373

DISPENSING CLOSURE FOR PAPER POWDER CONTAINERS

Filed Feb. 14, 1948

Fig. 1.

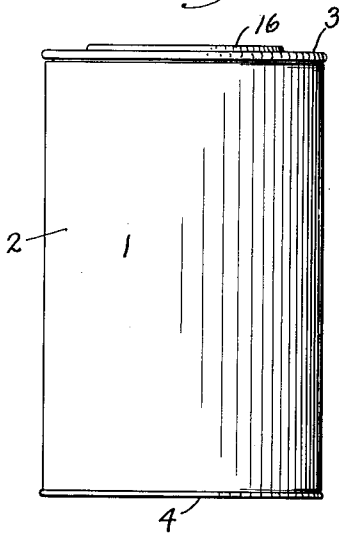



Fig. 2.

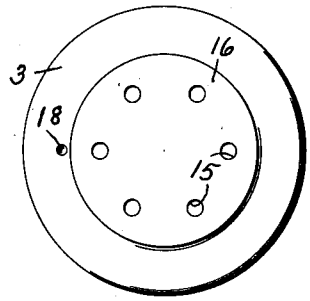



Fig. 3.

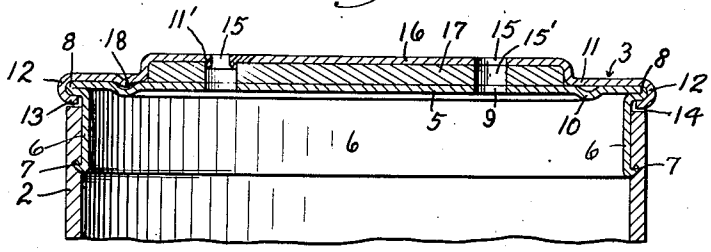



Fig. 4.

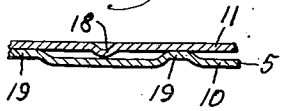
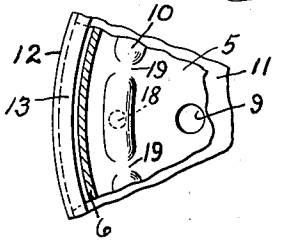



Fig. 5.




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Patented Feb. 12, 1952

2,585,373

# UNITED STATES PATENT OFFICE

2,585,373

## DISPENSING CLOSURE FOR PAPER POWDER CONTAINERS

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Application February 14, 1948, Serial No. 8,396

6 Claims. (Cl. 222—555)

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This invention relates to improvements in containers principally constructed of paper, cardboard, fiberboard, plastic or similar relatively light and inexpensive materials and adapted to contain powder, such as toilet powder or other finely divided materials. More particularly the invention relates to improvements in a dispensing closure for containers of this type and ordinarily constructed of sheet metal or similar sheet material and adapted to be applied as a unit to the end opening of the cardboard container.

It is a general object of the invention to provide for containers of the class mentioned, an improved dispensing closure structure having stationary and rotary parts connected together by marginal flange formations whereby one part is rotatably supported upon the other, both parts being particularly constructed and arranged whereby they both can be formed by the use of dies, thus assuring accurate fitting of the parts so as to avoid binding or jamming of the rotary part and assuring easy rotation thereof for opening and closing movements while providing a sift proof structure.

A further object of the invention is to provide for containers of the class mentioned a dispensing closure structure having an improved construction for rotatably mounting the rotary controlling plate upon the stationary closure plate and providing a seal to assure an anti-sift joint between the two plates.

A further object of the invention is to provide for containers of the class mentioned, a dispensing closure structure having an improved arrangement for mounting the closure plate and the rotary controlling plate and providing stop means for limiting the rotation of the controlling plate in closed and open positions.

Other objects and advantages of the invention will be in part pointed out in the following detailed description of an illustrative but preferred embodiment of the invention, and will in part become obvious as the disclosure proceeds.

The invention accordingly comprises the features of construction, combination of elements, and arrangements of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

This invention relates generally to improvements on the container structure disclosed in prior co-pending application of Robert Nyden and Harry K. Dickerman, Serial No. 603,415, filed July 6, 1945 Patent No. 2,442,959, issued June 8, 1948.

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For a more complete disclosure of the nature, objects and advantages of the invention, reference is had to the following detailed description and to the accompanying drawings, in which:

Fig. 1 is a side elevation of a container embodying the invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is an enlarged central vertical sectional view of the top end portion of the container showing the end closure structure;

Fig. 4 is a fragmentary detail section showing the structure for limiting rotation of the rotary controlling part of the dispensing closure; and

Fig. 5 is a fragmentary inner plan view partly in section, of the structure shown in Fig. 4.

Referring to the drawing for a detailed description of the illustrative embodiment of the invention shown in the drawing, a container 1 is shown having a main body portion 2 to which the top end closure structure 3 embodying the invention is applied. Also a bottom end closure 4 is applied to the lower end of the body 2. The bottom closure 4 is ordinarily made of metal and may be of any known preferred construction and applied to the container to make a tight joint. The body 2 is preferably cylindrical in shape as shown and constructed of cardboard, paperboard or other similar material such as suggested above and is of sufficient thickness and strength to support the container for use as shown.

The end closure structure 3 is preferably principally constructed of sheet metal and embodies an inner closure plate or disc 5 securely attached in the top end opening of the container body 2 so as to make a tight anti-sift joint and to securely attach the closure plate in stationary position on the container. For this purpose the stationary closure plate 5 is preferably formed with a circumferential depending skirt flange 6 integral with the closure plate and of a diameter to telescope with a tight closure fit within the walls of the body portion of the container. As shown this skirt flange preferably extends continuously entirely around the body of the container and is provided at its lower edge portion with an outwardly and upwardly turned hook flange 7 which is preferably also continuous. The hook flange 7 is arranged so as to be embedded or to bite into the inner surface of the container wall thus holding the closure plate 5 firmly in position and also making a tight anti-sift joint to avoid sifting or accidental escape of the powder. When the skirt flange 6 is forced in tight fitting engagement within the upper end of the container body, the hook flange 7 will be imbedded in the inner sur-

face of the container wall as shown to make an anti-sift joint and to attach the plate 5 securely in position. This arrangement is substantially the same as that disclosed in the co-pending application above referred to.

Substantially at the juncture of the skirt flange 6 with the stationary closure plate 5, the sheet metal plate is bent or folded upon itself to form a peripheral outwardly disposed double flange 8 preferably extending continuously entirely around the closure plate and extending outwardly just above the outer end of the wall of the container body part 2. Thus the double flange 8 is formed with upper and lower flange sections substantially parallel with each other and having an outwardly directed circumferential bend between the flange sections and forming a support for a closure plate as later described. The plate 5 is provided with dispensing or sift openings 9 arranged in any preferred manner. Also a stiffening and reinforcing corrugation 10 is formed in the plate 5 preferably being circular and extending substantially around the plate nearer the outer margin thereof.

For controlling the dispensing of the powder in the container, a rotary controlling plate 11 is mounted on the outside of the closure plate 5 being also of disc-like formation and having a peripherally disposed down-turned flange 12 partially enclosing the double flange 8 of the inner plate. This flange 12 preferably extends continuously around the margin of the rotary plate being bent downwardly around the outwardly directed bend of the double flange 8, and the lower edge portion 13 thereof is bent to underlie the double flange 8, thus securely retaining the rotary plate in its operative position upon the stationary plate. This flange structure also provides a rotary support for the rotary plate 11 on the double flange 8 so as to permit the plate to be rotated into opening and closing positions. It will be noted that the double flange 8 in its final operative position is spaced slightly above the upper end of the wall of the container body part 2 so as to form an annular groove 14 in which the lower edge portion 13 of the flange 12 is received in sliding relation therein.

At the marginal portion of the rotary controlling plate 11 inside of the depending flange 12 the two plates 5 and 11 are in close engagement with each other and also the down-turned flange 12 engages closely with the outer surface of the double flange 8, thus making a tight sift-proof joint, avoid accidental escape of the powder between the margins of the two plates. Also the rotary controlling plate 11 is provided with dispensing openings 15 similar to the dispensing openings 9, and spaced and arranged so as to align with the latter when the rotary plate assumes the open position shown in Fig. 3. The rotary plate 11 is off-set at its central portion 16 adjacent to the dispensing openings 15 so as to be spaced slightly above the adjacent portion of the closure plate 5, thus forming a cavity or pocket between the two plates in which the sealing disc 17 of any appropriate sealing material such as blotting paper or the like, is received. The sealing disc 17 is also provided with dispensing openings 15' permanently aligned respectively with the dispensing openings 15 of the controlling plate. This sealing disc is anchored to the rotary plate 11 so as to rotate therewith, and may thus be anchored by off-setting or drawing down parts of the plate 11 at one or more of the openings 15 to form anchors 11' engaging the sealing disc as shown at the left in Fig. 3. All of the openings 15 may thus be provided with anchors 11' if desired.



In order to limit the rotary opening and closing movements of the controlling plate 11, a limiting lug 18 is inwardly off-set from said plate and is received within the inner groove formed in the plate 5 by the corrugation 10. At this point the corrugation is formed with limiting stops 19 which cooperate with the lug 18 to limit the rotary movements of the rotary controlling plate 11 respectively in opening and closing positions.

It will be noted that the rotary support for the controlling plate 11, formed by the double flange 8 of the closure plate 5 and the down-turned flange 12 of the controlling plate, is entirely separate and independent from the body of the container, and from the attachment of the closure plate 5 to the body of the container. A particular important advantage of this arrangement is that both the closure plate 5 and the rotary controlling plate 11 can be constructed by the use of dies, and these two parts can thus be accurately sized and shaped, not only assuring a tight sift-proof connection between these two parts but also assuring that the rotary part can be easily and freely rotated without any binding or obstruction. It will be noticed that the peripheral down-turned flange 12 forms a grasping surface or bead positioned at the outer margin of the closure structure and substantially at or outward slightly beyond the outer surface of the container wall 2, so as to be accessible for easy grasping. By means of this arrangement together with the die fitting structure of the rotary bearing for the controlling plate 11, it will always be easy to rotate the controlling plate to open or close the dispensing openings. Even though the improved closure structure is manufactured rapidly in very large quantities and under factory methods and by use of automatic machinery, substantially all of the closures thus made will be substantially sift-proof and also fully operable, and there will be practically no defective ones.

When the controlling plate 11 is rotated from its open dispensing position shown in Fig. 3 the sealing disc is also rotated so as to disalign the dispensing openings of the rotary part with those of the stationary closure plate, thus effectively closing and sealing the dispensing openings. The sealing disc 17 effectively seals the dispensing openings against any accidental sifting when the controlling plate is moved into closing position. The limiting stops 19 cooperate with the lug 18 on the controlling plate to limit the latter in its opening and closing positions.

Since it is obvious that all portable containers of this type may be disposed or stacked upon their sides or even in inverted position, all directional terminology which may be employed in the claims is purely relative and has been chosen with the reference position in mind in which the axis of the container is vertical and the closure is applied to the top of the container.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

The invention having thus been fully described, the following is claimed:

1. In a dispensing closure for containers, in

combination, the container having a cylindrical enclosing wall with an opening, a closure plate for said opening having one or more dispensing apertures therein and having a circumferential depending skirt flange telescoping with said enclosing wall and attached thereto to hold the closure plate stationary in closing position on the container, said closure plate being bent or folded upon itself to form a peripheral outwardly disposed double flange extending around the closure plate substantially at the juncture thereof with said skirt flange, said double flange being spaced slightly above the upper edge of said enclosing wall to form an annular recess, a controlling plate closely overlying said closure plate having one or more dispensing apertures therein and having a down-turned peripheral flange overlying and partially enclosing said double flange and having its edge portion bent to underlie the latter in said annular recess so as to hold the controlling plate in operative position and to provide a rotary support therefor whereby it can be rotated to adjust said dispensing apertures of the closure and controlling plates into alignment for dispensing, and out of alignment for closing, said down-turned peripheral flange forming a grasping bead positioned at the outer margin of the closure whereby said controlling plate can be manually rotated, one of said plates having a portion thereof offset from the other plate to provide a pocket adjacent said dispensing aperture, and a sealing disc held in said pocket between said closure plate and said controlling plate, and anchored to said controlling plate.

2. In a dispensing closure for containers, in combination, the container having a cylindrical enclosing wall with an opening, a closure plate for said opening having one or more dispensing apertures therein and having a circumferential depending skirt flange telescoping with said enclosing wall and attached thereto to hold the closure plate stationary in closing position on the container, said closure plate being bent or folded upon itself to form a peripheral outwardly disposed double flange having upper and lower sections and outwardly directed circumferential bend and extending around the closure plate substantially at the juncture thereof with said skirt flange which forms a downward extension of the lower section of said double flange, said double flange and its circumferential bend being spaced slightly above the upper edge of said enclosing wall to form an annular recess, a controlling plate closely overlying said closure plate having one or more dispensing apertures therein and having a down-turned peripheral flange overlying and partially enclosing said double flange and the circumferential bend thereof and having its edge portion bent to underlie said double flange in said annular recess so as to hold the controlling plate in operative position and to provide a rotary support therefor whereby it can be rotated to adjust said dispensing apertures of the closure and controlling plates into alignment for dispensing, and out of alignment for closing, said down-turned peripheral flange forming a grasping bead positioned at the outer margin of the closure whereby said controlling plate can be manually rotated, one of said plates having a portion thereof offset from the other plate to provide a recess adjacent said dispensing apertures, and a sealing disc held in said recess between said closure plate and said controlling plate, said closure and controlling plates having complementary stop formations for limiting the rotary movements of said controlling plate in opening and closing positions.



3. In a dispensing closure for containers, in combination, the container having a cylindrical enclosing wall with an opening, a closure plate for said opening having one or more dispensing apertures therein and having a circumferential depending skirt flange telescoping with said enclosing wall and attached thereto to hold the closure plate stationary in closing position on the container, said closure plate being bent or folded upon itself to form a peripheral outwardly disposed double flange extending around the closure plate substantially at the juncture thereof with said skirt flange, said double flange being spaced slightly above the upper edge of said enclosing wall to form an annular recess, a controlling plate closely overlying said closure plate having one or more dispensing apertures therein and having a down-turned peripheral flange overlying and partially enclosing said double flange and having its edge portion bent to underlie the latter in said annular recess so as to hold the controlling plate in operative position and to provide a rotary support therefor whereby it can be rotated to adjust said dispensing apertures of the closure and controlling plates into alignment for dispensing, and out of alignment for closing, said down-turned peripheral flange forming a grasping bead positioned at the outer margin of the closure whereby said controlling plate can be manually rotated, one of said plates having a portion thereof offset from the other plate to provide a pocket adjacent said dispensing aperture, and a sealing disc held in said pocket between said closure plate and said controlling plate, and anchored to one of said plates.

4. A container and closure combination appropriate for the dispensing of pulverulent material in which a dispensing closure is permanently secured to the body of the container in a sift-proof manner, said combination comprising a container body having a substantially cylindrical wall portion terminating at its upper end in a plain vertically extending annular flange defining the end opening of said body, a closure assembly substantially occupying a plane transverse to the axis of said cylindrical body at the mouth of the cylindrical end opening thereof, said assembly comprising a closure plate having one or more dispensing apertures therein and a flat planar marginal portion providing a horizontal ledge of considerable radial extent, an integral peripheral skirt portion depending from said marginal portion and spaced inwardly from the extreme rim thereof a slight distance, said skirt projecting downwardly into the cylindrical body opening to telescope therewith and being secured thereto to hold the closure plate stationary in closing position on the container and provide a sift-proof connection therewith, the resulting overhanging lip and junction of the closure plate and the skirt comprising a double flange having an outwardly disposed circumferential sharp bend and upper and lower substantially parallel flange sections, the upper flange portion continuing in substantially the same plane radially inwardly toward the axis of the container and the lower flange bent perpendicularly downwardly to form said skirt, a controlling plate having one or more dispensing apertures therein and also having a flat planar horizontal marginal portion overlying and contacting with the corresponding flat planar marginal ledge por-

tion of said closure plate, the extreme outer periphery of said controlling plate being bent downwardly and inwardly around the sharp marginal bend of the double flange of said closure plate to provide a flange partially enclosing said double flange, said downwardly and inwardly bent enclosing marginal portion of the controlling plate being the sole means for securing the plates together, and the substantial radial extent of contact between the flat marginal portions of said plates, as well as the contact between the peripheral flanges, affording an efficient non-sifting rotary supporting connection, whereby said controlling plate may be rotated to adjust said dispensing openings of the closure and controlling plates into alignment for dispensing and out of alignment for closing.

5. The container and closure combination as set forth in claim 4 in which the dispensing closure is predominantly made of sheet metal or the like and the container body is made of fibrous material, the walls of the fibrous container being thicker than the sheet metal of the dispensing closure; in which the inward spacing of said peripheral skirt portion from the extreme rim of the margin of the closure plate is approximately equal to the thickness of the wall of said fibrous body portion; and in which said double flange is spaced slightly above the upper edge of said thick cylindrical body wall to form an annular recess therebetween, the depth of the recess thus being



approximately equal to the thickness of the container body wall, the extreme edge of the controlling plate which encloses the double flange of the closure plate snugly entering said annular recess.

6. The container and closure combination set forth in claim 4 in which one of said plates has a portion offset slightly from the general plane thereof to provide a shallow flat pocket adjacent said dispensing apertures, and a sealing disc is provided which is held in said pocket between said closure plate and said controlling plate; the sealing disc, the flat marginal contact areas, and the skirt and body wall connection all providing effective non-sifting means at all points where leakage could occur.

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