March 28, 1950 R. NYDEN ET AL 2,501,735

SELF-CLOSING POWDER CAN

Filed July 6, 1945

Fig. 1.

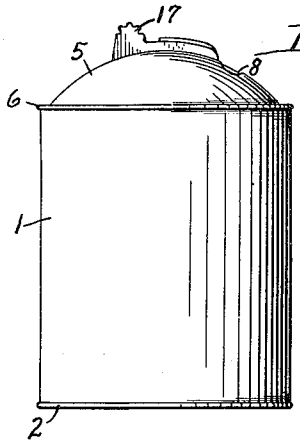


Fig. 2.

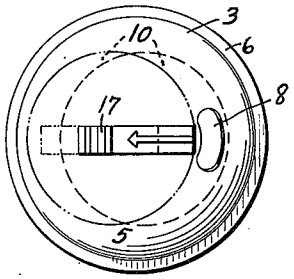


Fig. 5.

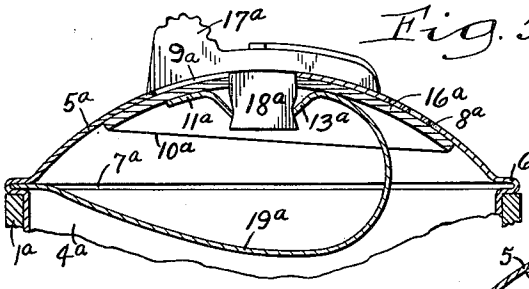
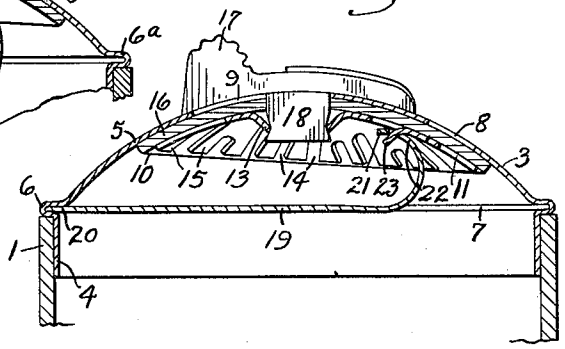


Fig. 3.



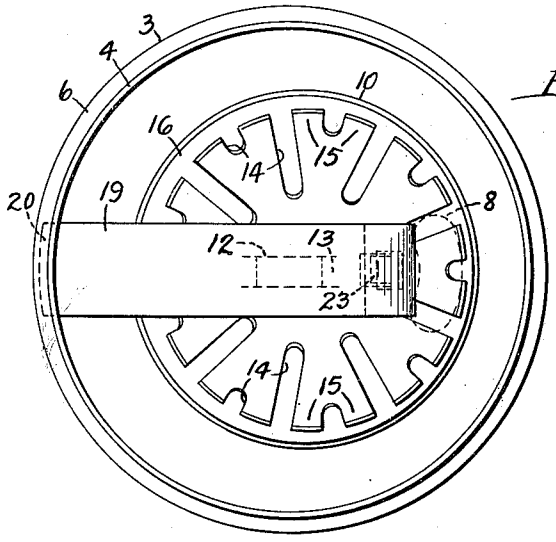
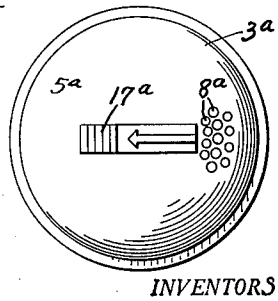


Fig. 4

Fig. 6.



INVENTORS,
ROBERT NYDEN
HARRY K. DICKERMAN
BY Carl W. Wicks,
Attorney

Patented Mar. 28, 1950 2,501,735

UNITED STATES PATENT OFFICE

2,501,735

SELF-CLOSING POWDER CAN

Robert Nyden, Manhasset, and Harry K. Dickerman, Buffalo, N. Y., assignors to F. N. Burt Company, Inc., Buffalo, N. Y., a corporation of Delaware

Application July 6, 1945, Serial No. 603,417

3 Claims. (Cl. 222—511)

1

This invention relates to improvements in containers or powder cans of the type in which the main body portion is constructed of paperboard, pasteboard, fiberboard and like material, with a dispensing end closure structure of metal, and more particularly it relates to an improved closure device for controlling dispensing of the container contents.

It is a general object of the invention to provide for containers of the class mentioned, an improved dispensing closure making a tight anti-sift joint preventing leakage, that can be quickly and easily installed on the body of the container and that can be manufactured in large quantities by automatic machinery under factory methods and at low production costs.

A further and more particular object of the invention is to provide for containers of the class mentioned, an improved dispensing closure device that automatically returns to closed position to make a tight sealing joint after it has been opened for dispensing a portion of the container contents.

A further object of the invention is to provide for containers of the class mentioned, a dispensing closure device having an improved closure member readily conformable to its seat in the head or end structure of the container, and embodying a supporting plate specially constructed to improve its flexibility and conformability.

Another object is to provide for containers of the class mentioned, an improved dispensing closure device operable either for automatic closing of the closure device and being convertible for manual operation in both opening and closing movements.

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

The invention accordingly comprises the features of construction, combination of elements, and arrangement 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.

For a more comprehensive 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 powder can or similar container embodying the invention;

Fig. 2 is a top plan view thereof;

2

Fig. 3 is a central vertical enlarged section of the top or dispensing closure of the container;

Fig. 4 is a bottom plan view of the closure structure as shown in Fig. 3;

Fig. 5 is a central vertical section similar to that of Fig. 3, but showing a slightly modified embodiment; and

Fig. 6 is a top plan view of the embodiment of Fig. 5.

Referring to the drawing for a detailed description of the illustrative embodiments of the invention there shown, and first to the embodiment shown in Figs. 1, 2, 3 and 4, the body or side walls 1 of the container are ordinarily constructed of cardboard, pasteboard, or other materials above suggested, but insofar as the present invention is concerned these container side walls may be constructed of metal or any other suitable material. Although the walls 1 are herein disclosed as being circular in cross section, any other suitable shape may be employed. The bottom 2 may be constructed of metal or other suitable material and is ordinarily engaged in tight fitting relation in the lower end of the tubular body portion.

The upper wall portion or end closure 3 of the container is also preferably constructed of sheet metal or other strong sheet material, and is formed with a depending skirt flange 4 adapted to fit closely in sealing anti-sift relation with the upper end of the wall 1 of the body portion. This skirt flange may be provided with any suitable means for holding it in its operative or assembled position so as to prevent accidental separation from the container body and to form a tight anti-sift joint, but since these features do not form a particular part of the present invention, it is deemed unnecessary to disclose them.

Above the skirt flange 4, the end wall portion or closure 3 is preferably outwardly domed at 5 so as to form, as shown in the illustrative embodiment, substantially spherical inner and outer surfaces. At the juncture of the domed portion of the end closure and the skirt flange 4 a crimp or bend 6 is formed in the closure member so as to provide an outwardly disposed rib or flange adapted to overlie the top of the wall 1 so as to limit the inner telescoping movement of the closure member and also to form an inner groove 7 extending around the base of the skirt flange and providing a supporting seat for an operating spring later described. The domed portion 5 of the end closure is provided with a dispensing opening which may be either a single opening 8, as shown in Figs. 2 and 3, or a plurality of small openings as shown in Fig. 6. The domed portion

5 of the closure member is also provided with an attaching opening 9 for the dispensing closure structure, said opening being in the form of an elongated slot.

As best shown in Fig. 3, the movable dispensing closure member 10 includes an inner attaching and supporting member or disc 11 preferably constructed of sheet metal or similar resilient material and having a centrally disposed attaching opening 12 adjacent to which are resilient inwardly deflecting attaching tongues 13 integral with the supporting member 11.

In order to increase the flexibility and conformability of the attaching and supporting member or disc 11, it is preferably formed with a series of radially disposed slots 14 providing a series of yielding resilient substantially radially disposed tongues or fingers 15 arranged around the supporting disc 11. This structure of the attaching and supporting disc 11 provides a flexibility thereof enabling it to conform substantially to the inner surface of the domed portion 5 of the end closure member and to form therewith a tight sealing closure.

In order to increase the sealing and anti-sift qualities of the inner closure member, a sealing member or disc 16 of suitable sealing material such as paperboard, fiberboard, plastic or the like is interposed between the attaching and supporting member 11 and the inner surface of the domed portion 5 of the end closure wall or plate. This sealing disc 16 is also provided with a centrally disposed opening through which extends the attachment for the outside operating member later described. When in assembled condition as shown in Fig. 3, the attaching and supporting plate or disc 11 is outwardly domed or dished to conform substantially to the inner surface of the domed portion 5, and the sealing member 16 is correspondingly dished so as to make a tight joint substantially over its entire surface and over the entire inner surface of the domed portion 5 with which it is in contacting relation. The sealing member 16 as shown extends entirely over the elongated slot 9 to provide therefor an effective seal.

For the purpose of operating or moving the inner closure member 10 an exterior operating member or handle 17 is mounted on the outside of the domed portion 5 extending over and entirely covering the elongated slot 9 and preferably being shaped at its inner surface to conform to said domed portion and to engage in sliding relation with said outer surface. This operating member 17 may be of any desired ornamental design and of such shape as to form a convenient handle for engagement by the user to operate the dispensing closure. At its inner side the operating member 17 is formed with an attaching device preferably as shown in the form of an integral extension or stem 18 adapted to extend through the attaching opening or slot 9 in the end closure plate 3 and through the central openings of the sealing disc and the inner attaching and supporting member 11. This operating member 17 together with its integral attaching stem 18 may be constructed of plastic material or the like. The attaching tongues 13 on the supporting plate 11 are positioned so that the free swinging ends thereof engage and bite into or are embedded into the outer side surfaces of the attaching stem 18 as best seen in Fig. 3, said ends being provided with sharp corners or with sharp points for this purpose. When the attaching stem and the supporting plate are forced

into assembled relation as shown in Fig. 3, the free swinging ends of the tongues engage and bite into the surface of the attaching stem so as to hold the operating member 17 and the supporting plate 11 firmly in assembled position. The attaching opening 9 is preferably in the form of an elongated slot in which the attaching stem 18 closely engages so as to support the inner closure member 10 for opening and closing sliding movements. The slot or attaching opening 9 is of sufficient longitudinal length to permit the closure member 10 to move from its normally closed position shown in Fig. 3 into open position for opening the dispensing opening 8. The attaching stem 18 engages closely with the longitudinal edges of the slot 9 so as to support and guide the opening and closing movements of the closure member 10 and connected parts.

For the purpose of urging the closure member 10 into its closed position an inner operating spring may be provided. This operating spring is shown in the form of a leaf spring 19 having one end 20 thereof seated and supported in the peripheral groove 7 formed in the upper end closure plate. At its opposite end 21 the spring 19 is formed with an opening 22 hooked over a supporting lug 23 integral with the supporting member or disc 11 so as to provide a pivotal connection with said disc. This pivotal connection provides for free relative movements between the spring and the attaching and supporting disc 11 so as to avoid any binding or obstruction during the opening and closing movements of the closure member 10. The pivotally attached end of the spring 19 is bent or deflected upwardly as shown, thus providing a hook-like attachment for attaching the spring to the supporting plate 11 so that the spring may be readily detached from operative position and is easily placed in operative position. The spring is normally stressed so as to urge the closure member 10 into its fully closed position as shown in Fig. 3 and is placed under additional stress when the closure member is moved to open the dispensing opening 8.

From the foregoing detailed description it will be understood that the inner closure member 10 is maintained in its tight sealing condition by the attaching stem 18 which engages with the attaching tongues 13. Also, it will be understood that the closure member is urged by the spring 19 into fully closed position as shown in Fig. 3. When it is desired to dispense a portion of the container contents, the user exerts pressure to the left in Fig. 3 on the operating member 17, thus moving or sliding the closure member 10 against the resistance of the spring 19 into position to open the dispensing opening 8. Upon release of the pressure upon the member 17, the closure member automatically returns by action of the spring 19 into its closed position where it is retained by action of the spring. Due to the pivotal connection between the spring 19 and the plate 11, there is a free adjusting action preventing any binding or resistance to the opening and closing movements.

In case it is desired to operate the closure 10 manually for both opening and closing movements thereof, the operating spring 19 may readily be disconnected by unhooking the pivotal connection 22, 23 and removing the opposite end 20 of the spring from its seat in the groove 7, whereupon the operator can move the closure member manually in either direction for opening and closing the closure member. With this arrange-

ment the closure member will be held in its open or closed position by the frictional engagement of the sealing disc 16 with the inner surface of the end wall and by the frictional engagement of the operating member 17 with the outer surface thereof, said operating member being somewhat wider than the width of the attaching slot 9 so as to overlap the end plate adjacent to the edges of the slot. As described and shown it will be seen that the operating member 17 extends entirely over the elongated slot 9 in all of its operative positions so as to form an outer anti-sift joint, and that the inner sealing member 16 extends entirely over this elongated slot in all operative positions of the closure member so as to provide an inner anti-sift joint. Also the attaching stem 18 fits closely in the opening in the sealing member 16 so as to avoid sifting of the powder. In this manner objectionable sifting of the powder through the closure device is effectively avoided. This anti-sift structure is substantially the same in the other disclosed embodiment of the invention which will now be described.

Referring to the modified embodiment of the invention shown in Figs. 5 and 6, certain features thereof are similar to the embodiment described above, and corresponding parts are designated by the same reference numerals with the addition of the index *a*. In this embodiment the inner attaching and supporting member or plate 11*a* is formed as an integral extension of the operating spring 19*a* instead of being made in the form of a separate unit as in the prior embodiment. Therefore, it will be seen that the pivotal connection 22, 23 of the prior embodiment is omitted and that the spring 19*a* is connected directly to the attaching stem 18*a* of the operating member 17*a* by means of the attaching tongues 13*a* which are integral with the end portion of the spring. These attaching tongues secure the parts in assembled relation by biting into the surface of the stem 18*a* as described in connection with the prior embodiment. The attaching and supporting portion 11*a* of the spring bears directly against the inner surface of the sealing member or disc 16*a* so as to hold the latter in tight sealing relation with the inner surface of the domed part 5*a* of the end closure plate 3*a*, the sealing disc being warped or dished to conform to said domed part. The end of the spring opposite to the closure member 16*a* may, as in the other embodiment, be seated and supported in the inner groove 7*a* of the end closure plate. In this embodiment, the powder or other container contents are dispensed through a series of dispensing openings 8*a* in the domed portion of the end plate which are opened and closed by the movements of the closure member 19. As in the prior embodiment, the spring 19*a* is tensioned so as to move the closure member into its closed position following an opening movement thereof and to hold it in closed position until it is desired to open it again. In this embodiment the operating spring 19*a* is intended to remain permanently in its operative position for effecting automatic closure of the closure member. The operation of this embodiment in other respects will be clear from the description above of the other illustrative embodiment.

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 container closure, in combination, a wall portion having a dispensing opening and an attaching opening and being outwardly domed and having an interior seat, an inner closure member mounted for opening and closing movements with reference to said dispensing opening and conforming approximately to said domed wall portion, said inner closure member including an inner attaching and supporting member and a sealing member interposed between said wall portion and said inner attaching and supporting member, an exterior operating member having operating connection in said attaching opening with said closure member, and a leaf spring having one end mounted in said seat of said wall portion and having its opposite end forming an integral extension of said attaching and supporting plate, said spring being stressed to urge said closure member into closing position.

2. In a container closure, in combination, a wall portion having a dispensing opening and having also an elongated slot forming an attaching opening, an inner closure member mounted for bodily sliding opening and closing movements with reference to said dispensing opening and including an inner attaching and supporting member and a sealing member interposed between said wall portion and said inner attaching and supporting member and extending in anti-sift sealing relation entirely over said elongated slot in all operative positions of said closure member, said inner attaching and supporting member engaging said sealing member to hold it in sealing relation over said elongated slot and against the inner surface of said wall portion, an exterior operating member slidably engaging the outer surface of said wall portion and overlying said elongated slot and extending entirely thereover so as to form an anti-sift seal therefor in all operative positions of said operating member and of said inner closure member, said exterior operating member having an attaching stem extending through said slot and supported and guided therein for sliding movements longitudinally thereof during the bodily sliding opening and closing movements of said inner closure member, said attaching stem also extending through an opening in said sealing member and through said inner attaching and supporting member and operatively connected to the latter so as to impart sliding opening and closing movements to said closure member.

3. In a container closure, in combination, a wall portion having a dispensing opening and having also an elongated slot forming an attaching opening, an inner closure member mounted for bodily sliding opening and closing movements with reference to said dispensing opening and including an inner attaching and supporting member and a sealing member interposed between said wall portion and said inner attaching and supporting member and extending in anti-sift sealing relation entirely over said elongated slot in all operative positions of said closure member, said inner attaching and supporting member engaging said sealing member to hold it in sealing relation over said elongated slot and against the inner surface of said wall portion, an exterior plastic operating member slidably engaging the outer surface of said wall

portion and overlying said elongated slot and extending entirely thereover so as to form an anti-sift seal therefor in all operative positions of said operating member and of said inner closure member, said exterior operating member having an attaching stem integral therewith and extending through said slot and supported and guided therein for sliding movements longitudinally thereof during bodily sliding opening and closing movements of said inner closure member, said attaching stem also extending through an opening in said sealing member and through said inner attaching and supporting member which is provided with a deflectible attaching tongue integral therewith and having a free end positioned for biting into said attaching stem in holding relation therewith so as to hold said attaching and supporting member in assembled relation and to maintain said sealing member in tight sealing relation and to impart bodily sliding opening and closing movements to said closure member, said wall portion being crimped to form an interior groove, and a leaf spring underlying said inner closure member and operatively connected thereto and having one extremity seated in said interior groove to support said spring in operative position.

ROBERT NYDEN.
HARRY K. DICKERMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
758,309	Fletcher	Apr. 26, 1904
1,157,537	Hess	Oct. 19, 1915
1,668,657	Reutter	May 8, 1928
1,668,658	Reutter	May 8, 1928
1,720,551	Heiter	July 9, 1929
2,394,942	Smith et al.	Feb. 12, 1946

FOREIGN PATENTS

Number	Country	Date
527,169	France	July 20, 1921
546,074	France	Aug. 10, 1922