July 29, 1952 R. NYDEN ET AL 2,605,028

SEALING CLOSURE OF LIMITED ROTATABLE ADJUSTMENT FOR POWDER BOXES OR THE LIKE

Original Filed July 6, 1945

Fig. 1.

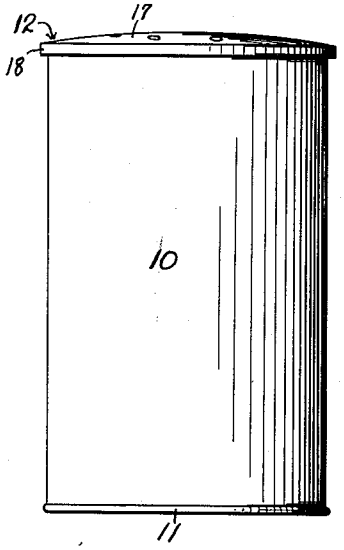


Fig. 6.

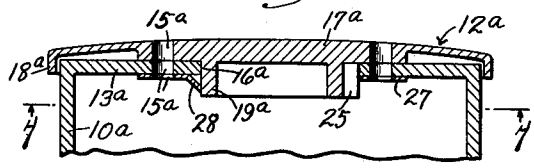


Fig. 2.

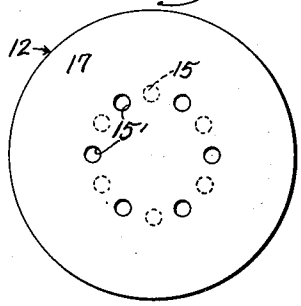


Fig. 5.

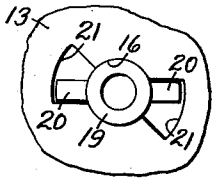


Fig. 3.

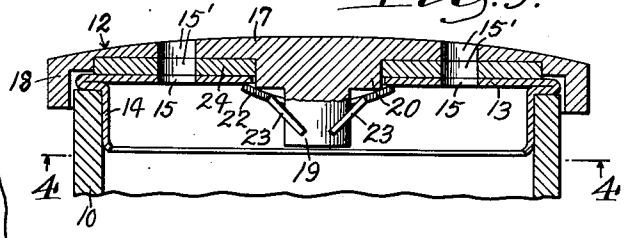


Fig. 8.

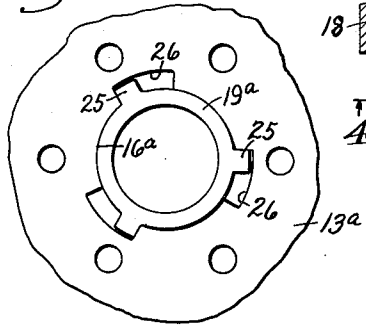


Fig. 4.

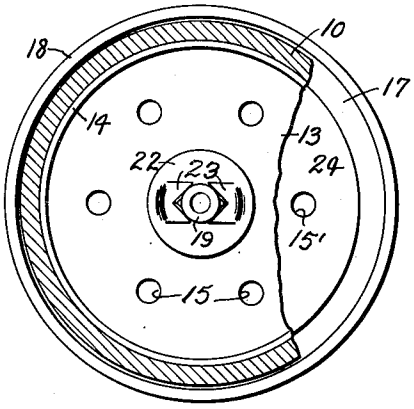
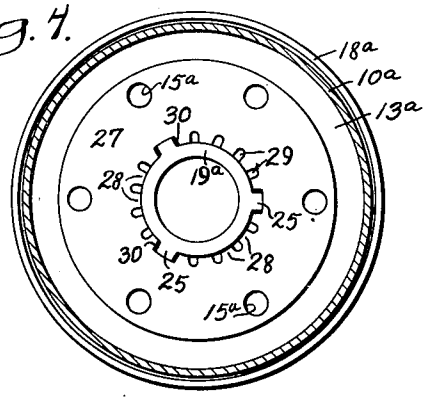


Fig. 7.



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SEALING CLOSURE OF LIMITED ROTATABLE ADJUSTMENT FOR POWDER BOXES OR THE LIKE

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Original application July 6, 1945, Serial No. 603,418, now Patent No. 2,526,397, dated October 17, 1950. Divided and this application May 28, 1947, Serial No. 750,967

2 Claims. (Cl. 222—542)

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This invention relates to improvements in containers or boxes of the type usually having their main body parts constructed of paper, paperboard, cardboard, fiberboard, plastic, and similar non-metallic materials, and more particularly to improvements in sifter or dispensing closures for containers of this class adapted to dispense the container contents usually in the form of dry powder or comminuted material, such as cosmetic powders and the like.

It is a general object of the invention to provide for containers of the class mentioned, an improved sifter closure for controlling dispensing of the container contents which, while being capable of manufacture in large quantities by factory methods and at low production costs, is well adapted to make a tight anti-sift sealing closure readily adjustable into opening and closing positions, and also presenting an attractive appearance appealing to a discriminating class of users.

Another object of the invention is to provide for containers of the class mentioned, a dispensing device having an improved attaching means for attaching the parts together in operative position and permitting the parts to be rapidly assembled and permanently maintained in tight anti-sift condition.

A further object of the invention is to provide for containers of the class mentioned, an improved dispensing or sifter closure that can be manufactured in a large degree from non-metallic materials, but also combining metallic and plastic materials which are well adapted for making a tight anti-sift dispensing closure.

Still another object of the invention is to provide for containers of the class mentioned, a dispensing closure device with improved means for attaching the parts thereof together and for facilitating assembly in placing the parts in correct relative positions so as to speed up production and to avoid errors in assembly.

Other objects of the invention will be in part pointed out in the following detailed disclosure 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,

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reference is had to the following detailed description and to the accompanying drawing in which:

Figure 1 is a side elevation of a powder can or container embodying the invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is an enlarged fragmentary central vertical section;

Fig. 4 is an enlarged horizontal section and inverted plan taken substantially on the line 4—4 of Fig. 3 looking in the direction of the arrows, parts being broken away to disclose the structure more clearly;

Fig. 5 is a fragmentary detailed view showing the connection of the plastic rotary cap member with the end closure plate;

Fig. 6 is a central vertical sectional view similar to that of Fig. 3 but showing a modified embodiment of the improved sifter closure;

Fig. 7 is a horizontal sectional and inverted plan view taken substantially on the line 7—7 of Fig. 6 looking in the direction of the arrows; and

Fig. 8 is a fragmentary detailed view of the embodiment of Figs. 6 and 7 showing the connection of the rotary plastic cap member with the head of the container.

The invention herein disclosed is fully shown and described in applicants' prior application, Serial No. 603,418, filed July 6, 1945, now U. S. Patent 2,526,397, granted October 17, 1950. Therefore, this application is a division of the earlier application.

Referring to the drawing for a detailed description of the illustrative embodiments of the invention there shown, and first to the preferred embodiment shown in Figs. 1, 2, 3, 4, and 5, the improved dispensing closure is illustrated as being applied to a container or powder can having a body part 10 with side walls ordinarily constructed of paper or fibrous stock as above mentioned. While the container is shown as being circular in cross-section, it will be understood that it may be of other cross-sectional shapes such as square, rectangular, triangular, polygonal, etc. At its bottom end the container is closed by a bottom closure or plate 11 which may be of metal and of any well-known preferred structure. The upper end of the container is fitted with the improved dispensing closure indicated generally at 12.

As best shown in Figs. 3 and 4, the improved dispensing closure 12 embodies an end plate or wall 13 forming the end or top wall of the container and preferably constructed of sheet metal which may be tinned or otherwise treated to pre-

vent rust or corrosion. As shown, the end plate or wall has a depending marginal or skirt flange 14 sized and proportioned to fit closely in telescoping relation within the end of the tubular body 10. Also, the skirt flange 14 may be specially formed so as to provide a firm anti-sift attachment to the body 10 when the flange is inserted into its final operative position in the end of the container. Since the particular attachment of the end wall 13 to the body 10 of the container does not form a part of the present invention, it is deemed unnecessary to disclose it further herein, and for this reason the present showing of the attachment of the end plate 13 with its skirt flange 14 to the body 10, may be regarded as being merely diagrammatical.

Although the end plate or wall 13 is shown as being of substantially the same size as the end of the body 10, it will be understood that it need not necessarily be so. This end wall is formed with a plurality of dispensing openings 15 which may be arranged in any desired form for dispensing or sifting the container contents and any desired number of dispensing openings may be provided. This end wall 13 is also provided with a centrally disposed attaching opening 16 through which an attaching means is extended for attaching the outer rotary cap member or part 17 of the dispensing control structure in operative position on the container.

As clearly disclosed in Figs. 3 and 4, the dispensing closure structure 12 includes a rotary cap member or part 17 ordinarily constructed of plastic material in a single integral piece and preferably extending entirely over the end of the container. The rotary cap member 17 is also formed with dispensing openings 15' positioned to align respectively with the dispensing openings 15 of the end plate 13. A peripheral depending skirt flange 18 is formed on the rotary cap member 17 being preferably roughened or serrated on its outer surface to form a grip conveniently engageable by the operator for turning the cap member into opening and closing positions. This depending skirt flange 18 engages closely outside of the upper end of the container body 10 so as to present an attractive finished appearance.

At its inner side the rotary cap member 17 is formed with an integral attaching stem or stub shaft 19 preferably circular in cross section as shown and engaging in close-fitting rotary bearing relation within the attaching opening 16 of the end plate 13. This attaching stem is formed at its base with oppositely disposed integral enlargements forming stop lugs 20 positioned respectively for reception in the sector-shaped slots 21 in the end plate 13 and forming outwardly radially disposed extensions of the central attaching opening 16. As later more fully described the stop lugs 20 are rotatably reciprocable in the sector-shaped extensions or slots 21 to limit opening and closing movement of the rotary cap member.

For holding the rotary cap member 17 securely in its assembled relation on the top of the container, an attaching member is provided which is shown in the form of an attaching washer 22 preferably of spring metal such as spring steel and having one or more integral swingable attaching tongues 23 deflected downwardly or inwardly at the under side of the attaching washers and having end edge portions provided with sharp corners or points adapted to be imbedded in firm securing relation into the adjacent surface of the plastic attaching stem 19. This attaching washer may be dished or convexed downwardly as clearly shown in Fig. 3 engaging at its outer rim with the inner surface of the end plate 13 so as to slide thereover when the rotary cap member is rotated to open and close the dispensing openings. The attaching tongues 23 are initially positioned so that the space between the free ends thereof is somewhat less than the diameter of the attaching stem 19. Thus when the attaching washer is forced into its normal holding position on the attaching stem the tongues 23 will be caused to be deflected or swung inwardly slightly on the washer to which they are attached. In this manner the attaching tongues are yieldingly urged, due to their resiliency and that of the washer material, into engaging position against the attaching stem and the free ends are forced against the stem and caused to be imbedded or to bite into the outer surface of the stem thus holding the parts securely together in assembled relation. Any movement intended to separate the parts from this fully assembled position will cause the ends of the attaching tongues 23 to be imbedded more firmly into the surface of the plastic stem 19 and accidental disassembly or loosening of the parts is thus positively resisted and the parts are maintained permanently in tight anti-sift condition.

Interposed between the end wall or plate 13 and the rotary plastic cap member 17 is a sealing disc or washer 24 preferably of appropriate sealing material such for example as paperboard, fiberboard or the like. The sealing disc 24 is preferably seated as shown within an appropriate recess formed in the under side of the rotary cap member 17 in which recess the disc fits tightly so as to make a tight anti-sift joint. The sealing disc 24 is also provided with dispensing openings 15' forming extensions respectively of the openings 15' of the cap member 17 and spaced for alignment respectively with the dispensing openings 15 in the end plate 13. As best shown in Figs. 3 and 5 the sealing disc has a central opening for closely receiving and conforming to the inner or base portion of the attaching stem 19 with its opposite extensions 20, thus non-rotatably attaching the sealing disc to the undersurface of the rotary cap member 17 and forming therewith a tight anti-sift joint.

It will be understood from the foregoing description that the improved dispensing closure not only is simple and inexpensive in construction and easily assembled and operated, but it forms an efficient anti-sift structure for preventing accidental sifting of the powder from the container. In order to open or close the dispensing openings the rotary cap member 17 with its supporting stem 19 may be rotated on the end wall 13 by engagement by the user of the skirt flange 18 which provides a convenient grip for this purpose. It will be seen that the sealing disc 24 is rotated with the rotary cap member 17 and when the dispensing openings in the cap member have been moved into aligning position with those in the end plate 13 the integral stop lugs 20 of the cap member will engage in limiting relation with adjacent edges of the sector openings or slots 21 in the end plate 13. Similarly when the cap member is rotated in the opposite direction to close the dispensing openings, these stop lugs will engage in limiting relation with the opposite edges of the openings 21.

In the modified embodiment of the invention shown in Figs. 6, 7 and 8, a one-piece rotary plastic cap structure is used as in the embodiment above described and other structural fea-

tures are also similar, and corresponding parts are designated by the same reference numerals with the addition of the index "a." In this embodiment, however, the top or end wall structure 13a of the container body 10a is made of paper or fibrous stock the same as the body 10a and may be attached to the body in any desired well-known manner and preferably by making it integral with the body as shown in Fig. 6. Since the attachment of the end wall 13a to the body 10a may be of any desired known structure and does not form a part of the present invention except in combination, it is deemed unnecessary to disclose it in detail.

As in the embodiment first described above, the rotary plastic cap structure 17a is provided with an inner integral attaching stem or stub shaft 19a preferably substantially circular in horizontal cross section as shown and provided with one or more exterior longitudinal ribs or lugs 25, three such ribs being shown spaced substantially 120° apart. These ribs as shown may extend substantially for the full length of the attaching stem 19a which, as best shown in Fig. 8, is received within the central attaching opening 16a in the end wall 13a, said opening being provided with cutaway marginal slots or seats 26 adapted respectively to receive the ribs or stop lugs 25 to limit rotative movements of the rotary cap member 17a. The slots or seats 26 are each of a length to permit sufficient amplitude of rotation in one direction of the cap member to position the same for dispensing the container contents when the dispensing openings 15a of the rotary cap member 17a are respectively aligned with the dispensing openings 15a of the end wall 13a. When the rotary cap member is rotated in the opposite direction, the stop lugs 25 contact with the opposite ends of the seats 26 to check rotation when the dispensing openings in the cap member and end wall are disaligned in closing position.

An inner separate attaching washer 27 preferably of spring metal or the like is employed as shown in Figs. 6 and 7 being provided with integral attaching tongues 28 similar to the attaching tongues 23 above described and being deflectable inwardly and engageable at their inner free ends in securing relation with the attaching stem substantially as described above in connection with the attaching washer 22. However, in this embodiment there is a series of attaching tongues 28 extending substantially around the inner opening of the attaching washer 27 and formed by cutting small radial slots 29 in the washer. Also, the washer is formed at the margin of its central receiving opening with three seats or pockets 30 spaced for respectively receiving the limiting ribs or lugs 25 of the attaching stem whereby the washer is constrained to rotate with the stem and the cap member 17a. In this embodiment the attaching washer 27 preferably has a flat inner surface engaging in close sealing relation with the inner surface of the end wall or head 13a so as to make a tight joint and to improve the anti-sift qualities. The sealing and attaching washer 27 is also formed with dispensing openings 15a respectively aligning with the dispensing openings 15a of the rotary cap member 17a.

From the foregoing description it will be understood that the rotary cap member 17a may be rotated by grasping the skirt flange 18a so as to bring the dispensing openings 15a in the cap member and sealing washer 27 into alignment respectively with the dispensing openings of the end wall or head 13a as shown in Fig. 6. In this dispensing position the rotative movement of the rotary cap member 17a will be checked by engagement of the stop lugs or ribs 25 with the respective adjacent ends of the slots 26 of the end wall. Similarly when the rotary cap member 17a is rotated in the opposite direction to close the dispensing opening, the movement will be checked by engagement of the ribs 25 with the opposite terminals of the slots 26 when the closure is in sealed closing position.

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 having an attaching opening and circumferentially spaced curved bearing surfaces at said attaching opening, a dispensing controlling structure mounted on said wall portion and having a rotary cap member rotatable for opening and closing movements and having a dispensing opening positioned for alignment with said first mentioned dispensing opening, said rotary cap member having an attaching extension forming a rotary stub shaft extending through said attaching opening and having a recess opening into its inner side and surrounding said stub shaft for receiving a sealing member, said attaching opening having a plurality of extension openings radially outwardly offset from said bearing surfaces and spaced apart circumferentially and respectively positioned between said curved bearing surfaces, said rotary stub shaft having a plurality of curved peripheral bearing surfaces circumferentially spaced apart and rotatably engaging in supporting relation respectively with said first mentioned bearing surfaces, limiting lugs spaced apart on said stub shaft and extending radially outwardly therefrom respectively into said offset extension openings to limit opening and closing movements of said cap member, an attaching member engaging said stub shaft inside of said wall portion for holding the parts in assembled relation, and a sealing member surrounding said stub shaft and seated in said recess in the underside of said cap member between said wall portion and said rotary cap member and having a dispensing opening positioned for alignment with said first mentioned dispensing opening, said sealing member being engaged by said limiting lugs of said stub shaft for causing rotation of the sealing member with rotation of said cap member.

2. In a container closure, in combination, a wall portion having one or more dispensing openings and having an attaching opening disposed centrally thereof, said opening being substantially butterfly shaped having oppositely disposed circular arcs of identical relatively small radii of curvature and intervening alternating oppositely disposed arcs of considerably greater radius of curvature, the adjacent ends of the adjoining arcs of different curvature being connected by radially extending edges substantially defining truncated sectors and completing the peculiar configuration of the attaching opening; a dispensing controlling structure mounted on said

wall portion, said structure comprising a rotary cap member rotatable for opening and closing movements and having one or more dispensing openings positioned for alignment respectively with said first mentioned dispensing openings, an attaching post depending centrally from said cap member, extending through said attaching opening and functioning as a rotary stub shaft; said post having a cross-sectional configuration adjacent the plane of the attaching opening in said wall which comprises two oppositely disposed circular arcs of identical small radii of curvature, said radii being substantially the same as those of the arcs of said attaching opening so as to provide snug bearing surfaces between the post and the opening, said adjacent post cross-section also comprising two diametrically extending projections which are appreciably narrower circumferentially than the truncated sector areas of the opening, and terminating radially short of the outer greater arcs of the opening, whereby

the inner smaller arcuate edges of the post and the opening comprise the sole bearing surfaces and whereby the post projections comprise stop elements having limited movement within the truncated sector areas of the opening; and a locking element securing said post against axial movement in said opening.

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

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