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CLOSURE FOR CONTAINERS

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Fig. 1

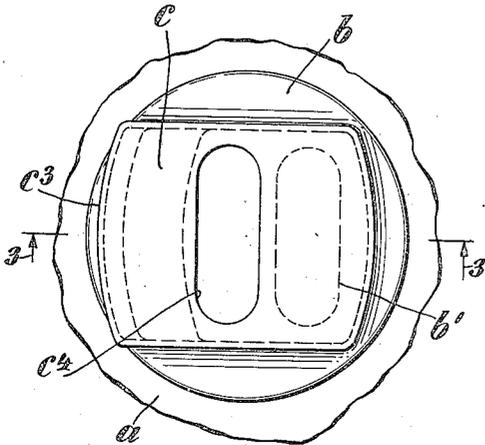


Fig. 6

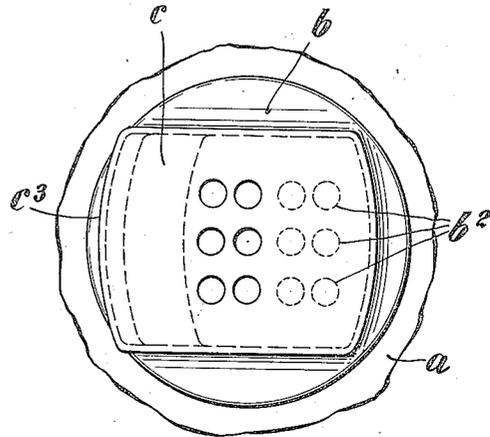


Fig. 2

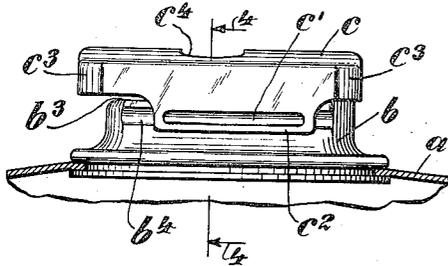


Fig. 4

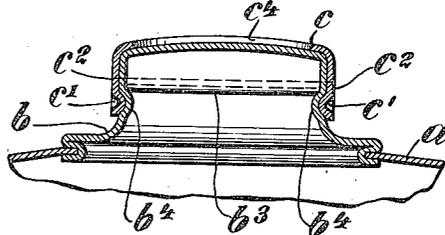


Fig. 3

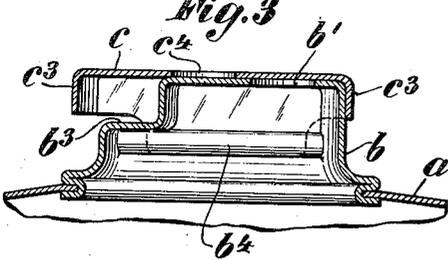


Fig. 5

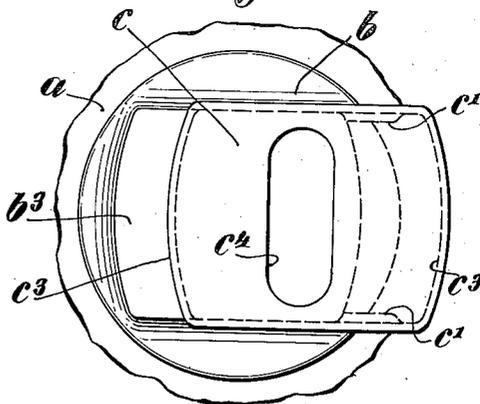
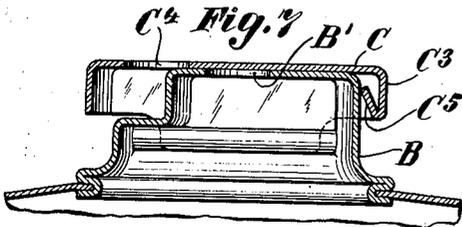


Fig. 7



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CLOSURE FOR CONTAINERS

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5 Claims. (Cl. 221—62)

This invention relates to closures for containers and is particularly designed for use on containers for tooth powder, talcum powder, and the like.

The provision of a satisfactory closure for the purpose indicated presents many difficulties which are not apparent to the layman. The requirements of manufacture from the standpoint of facility in manufacture and assembly and cost are primary considerations which render many useful closures uncommercial. The requirements of the user in respect of eye-appeal, powder tightness, ease of dispensing, and ease and certainty in operation, are also primary considerations which render many inexpensive closures unacceptable to the public.

The primary object of the present invention is to provide a closure which shall satisfy the requirements of both the manufacturer and the user. In accordance with the invention the improved closure is one which is powder tight when not in use, conveniently operable by easy pressure of the fingers, free in dispensing, compact and attractive in appearance, and inexpensive to manufacture.

More specifically the improved closure comprises only two parts, namely, a neck shell and a reciprocable slide valve by which the dispensing openings may be closed and opened. The construction and relationship of these two parts in accordance with the improved design are such as to permit the use of a slide valve of minimum length with a dispensing opening of maximum area, as is highly desirable. The construction and relationship are further characterized by the provision of a neck shell which tends to prevent clogging of the powder and to facilitate its free flow during dispensing.

The objects and advantages indicated are obtained generally by constructing the neck shell at its dispensing end with a reduced or shouldered segment over which the slide valve may move without interference to bring the dispensing openings into registry. In the preferred form the slide valve is so constructed as to conceal the said stepped or shouldered portion of the neck shell thus preserving a pleasing effect of symmetry and balance despite the fact that the dispensing openings may not be formed symmetrically with reference to the center axis of the neck shell.

These and other features of the improved design will be described in greater detail in connection with the embodiments shown in the accompanying drawing wherein

Figure 1 is a view in plan of the improved

closure, the breast of the can being broken away; Figure 2 is a view in side elevation of the closure shown in Figure 1, the breast of the can being shown in section;

Figure 3 is a view in section through the closure shown in Figure 1 taken on the plane indicated by the line 3—3 of Figure 1 and looking in the direction of the arrows;

Figure 4 is a view in transverse section through the closure shown in Figure 2 and taken on the plane indicated by the line 4—4 of Figure 2 looking in the direction of the arrows;

Figure 5 is a plan view similar to Figure 1 but showing the slide moved to the right to bring the dispensing openings into alignment;

Figure 6 is a plan view similar to Figure 1 but showing the provision of orifices instead of slots;

Figure 7 is a view in section through a modified form of closure embodying the improvements and showing the dispensing opening in the neck shell on the center line thereof.

The breast of a container is indicated at *a* and for the purposes of this disclosure may be regarded as of metal to which is secured in accordance with established practice a neck shell *b*. This neck shell is ordinarily symmetrical in form and provided at its dispensing end with an opening such as a slot *b'* or a plurality of openings such as are indicated at *b2* in Figure 6. Whatever form of opening may be provided it is necessary particularly in the dispensing of tooth powder, for example, that it be of relatively large area to assure free flow. This requirement in the ordinary construction where the neck shell is symmetrical in form makes it necessary to provide for a relatively extended movement of the controlling slide valve, and, in turn, for a slide valve of relatively extended dimensions and superficial area. It is this condition particularly which the present invention seeks to overcome. The improved construction permits of the use of dispensing openings of relatively large area with a slide valve of relatively small dimensions. The construction and relationship of parts thus contribute to eye appeal, facility of operation, simplicity and inexpensiveness.

Referring now particularly to Figure 3 it will be seen that a segment of the neck shell *b* at the dispensing end is shouldered or stepped inwardly at *b3* thus making the dispensing end of reduced area and forming a deflecting baffle within the neck shell which prevents the clogging of powder and is conducive to free dispensing. In the form shown in Figure 3 the dispensing slot *b'* is not disposed on the axis of the neck

shell but is offset. It is of relatively great width and superficial area as appears from Figure 1.

The controlling valve for the opening *b'* is formed as a reciprocable slide *c* which itself constitutes a form of cap partially enclosing the end of the neck shell. The opposite sides of the neck shell are formed with grooves or tracks *b4* in which engage beads *c'*, respectively, formed in depending flanges *c2* which are carried by the sliding cap *c*. The upper surface of the cap *c* engages the end of the neck shell intimately and is mounted in sliding relation thereto. The cap is held firmly in place and guided in its movements by the interengagement of the beads *c'* with grooves *b4* in the neck shell.

At its opposite ends the sliding cap *c* is formed with depending flanges *c3* the depth of which is determined by the depth of the shoulder *b3* formed in the neck shell. The depending flange *c3* adjacent to the shoulder is of such depth that its lower edge will just clear the horizontal portion of the shoulder when the slide is moved to the right as viewed in Figure 3. In contour, this flange *c3* conforms to the cross sectional outline of the shouldered segment *b3* of the neck shell. Similarly, the depending flange *c3* at the right end of the slide conforms in contour to the portion of the neck shell with which it engages when the parts are in the relation shown in Figure 3.

The sliding cap *c* is formed with the dispensing opening *c4* which is similar in shape to the dispensing opening *b'* and preferably of the same dimensions.

From the description given it will be apparent that when the parts are in the relation shown in Figures 2 and 3 the opening *c4* in the cap *c* is out of alignment with the opening *b'* and the closure is sealed against leakage. To improve the sealing the grooves *b4* in the neck shell may be slightly out of parallelism with the end of the neck shell so that when the dispensing openings are moved out of alignment a slight force is exerted on the cap *c* tending to pull it down into more intimate engagement with the end of the neck shell. As viewed in Figure 3 this effect is obtained by spacing the grooves *b4* at a greater distance from the end of the neck shell at their left ends than at their right ends.

It will further be observed that when the parts are in the relation shown in Figures 2 and 3 the cap appears in substantially symmetrical relation to the base of the neck shell, that is to say, its ends do not protrude beyond the beading at the base. Thus the closure generally speaking appears to be symmetrical with respect to the center line of the neck shell. The depending side flanges of the cap *c* practically conceal the shoulder *b3* in the neck shell. When the dispensing openings are to be brought into alignment the finger is applied directly to the left end of the cap *c* as viewed in Figures 2 and 3, and it is moved to the right, the beads *c'* sliding in the grooves *b4*. Since the end flange *c3* clears the shoulder *b3* movement of the cap is not interrupted by the neck shell until the end flange comes into direct engagement with the shouldered segment. In this relationship, it will be found that the opening *c4* in the cap is in alignment with the opening *b'* in the neck shell as is desired.

The improved construction accomplishes the important purpose of reducing the over-all length of the slide while permitting the use of large dispensing openings. It will be apparent that if the neck shell were not provided with the

shoulder *b3* but were formed symmetrically the necessary range of movement of the sliding cap *c* could be accomplished only by extending the cap *c* for a distance equal at least to the length of the horizontal portion of the shoulder *b3*. Because of this shoulder which the depending flange *c3* clears in its movement the necessary amplitude of movement for the sliding cap is afforded without the necessity of extending it beyond the side wall of the neck shell for a distance equal to the amplitude of movement.

When the dispensing openings are in alignment the powder is discharged by inverting the container. Because of the reduced cross section of the dispensing end of the neck shell the tendency for powder to clog therein is reduced and because of the presence of the deflecting baffle constituted by the shoulder *b3* the direction of flow of the powder to the dispensing opening is constantly changed thereby breaking up the tendency to lump and assure a freer flow.

In order to close the openings the finger is applied to the depending flange *c3* at the right end of the cap and it is slid to the left until this flange engages the exterior of the neck shell thereby constituting a positive stop.

A further distinctive advantage of the construction is the convenient one hand operation which is afforded. While many known closures purport to permit convenient operation with one hand few of them do so practically. In the improved construction the sliding cap *c* presents surfaces of large superficial area on the depending flanges *c3* so that ready engagement of the thumb or forefinger is permitted when the container is held in one hand. Pressure of the thumb or finger on the sliding cap is exerted laterally and the cap is moved by a direct push. It is unnecessary to provide any special finger pieces or corrugated surfaces since pressure is exerted directly on the cap and in the line of its movement.

The same advantages are obtained by the improved construction when the dispensing openings are of multiple number as shown in Figure 6 in that such openings may be of relatively large area and relatively numerous thereby requiring a relatively long movement of the sliding cap. Despite the actual amplitude of movement of the cap it need not be of extended length because of the provision of the shouldered neck shell.

In Figure 7 the parts are essentially of the same construction and relationship except that the dispensing opening in the neck shell *B'* is centrally disposed on the axis thereof. In this embodiment the dispensing opening *C4* in the sliding cap *C* is normally disposed to one side of the center axis when the openings are out of registry. Movement of the sliding cap in the manner hereinbefore described will bring the openings into registry.

In Figure 7 the depending flange *C3* at the right end of the cap may be reversely bent as indicated at *C5* to form a yielding stop engageable with the exterior wall of the neck shell to limit the movement of parts as will be apparent. This construction also provides true symmetry of the cap with relation to the base of the neck shell and brings the end flanges thereof in the same corresponding positions with respect to the beading at the base of the neck shell.

The invention is not to be limited in its application to the precise form and relative dimensions of the parts as illustrated herein but its true scope is defined by the claims attached hereto.

I claim:

1. A closure for containers having a neck shell formed with a shoulder adjacent its dispensing end and a slide valve mounted movably on the neck shell, a portion of the slide valve being movable over the shoulder in one direction of travel.
2. In a closure for containers, a neck shell having a segmental shouldered portion adjacent the dispensing end and a dispensing opening in the end wall, a cap engaged slidably with the neck shell and having a dispensing opening, said cap having a portion movable over the shoulder in one direction of travel.
3. In a closure for containers, a neck shell having a shouldered portion adjacent its dispensing end and a dispensing opening in the end wall, a cap mounted on the neck shell in movable engagement therewith and having a dispensing opening movable into and out of registry with the first named opening and a limit stop carried with the cap and movable over the shoulder into engage-

ment with the neck shell in one direction of travel.

4. In a closure for containers, a neck shell having a shouldered portion adjacent its dispensing end and a dispensing opening in the end wall, a cap mounted on the neck shell in movable engagement therewith and having a dispensing opening movable into and out of registry with the first named opening and a limit stop carried with the cap and movable over the shoulder into engagement with the neck shell in one direction of travel, and a second limit stop carried by the cap movable into engagement with the neck shell in the other direction of travel.

5. A closure for containers having a neck shell shouldered adjacent its dispensing end, a cap mounted on the neck shell and formed with a skirt enclosing the end of the neck shell, and means carried by the skirt to engage the neck shell to secure the cap movably thereon.

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