

Oct. 16, 1934.

C. B. F. BRILL

1,977,302

CLOSURE

Filed March 31, 1934

Fig. 1.

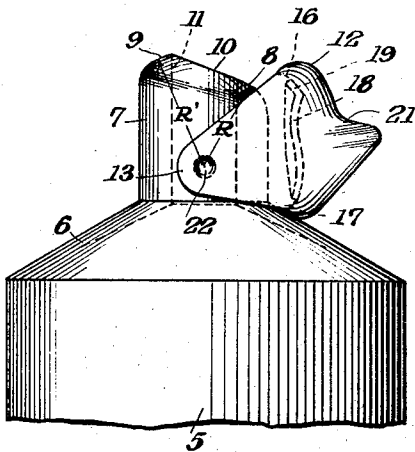


Fig. 2.

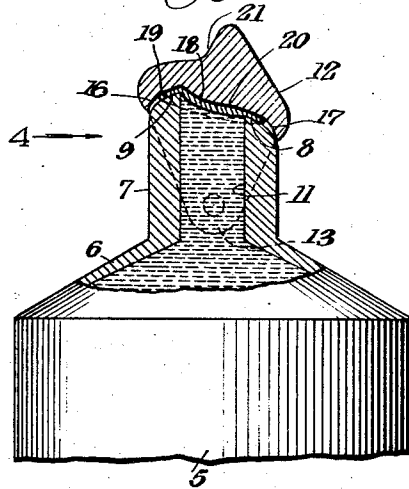


Fig. 3.

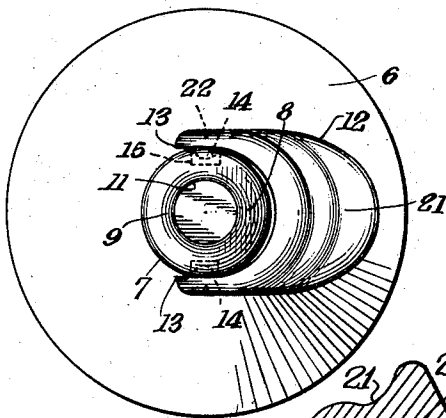


Fig. 4.

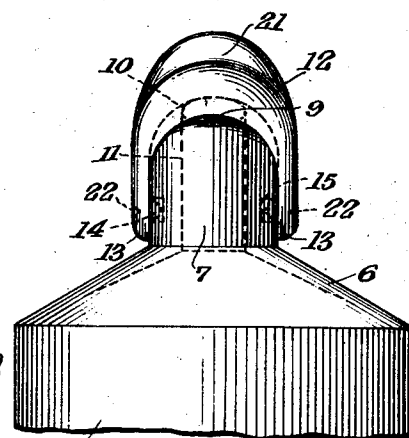
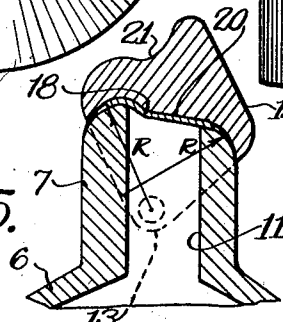


Fig. 5.



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1,977,302

CLOSURE

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Application March 31, 1934, Serial No. 718,350

11 Claims. (Cl. 221-60)

This invention relates to closures generally but in particular, to closures for paste tubes and the like.

The objects of the invention are to provide a simple, inexpensive, easily assembled construction, which will be tight sealing and maintained so, without the use of springs or other adjuncts.

These and other desirable objects are attained by the novel features of construction, combinations and relations of parts hereinafter described, illustrated in the accompanying drawing and broadly covered in the claims.

The drawing accompanying and forming part of the specification illustrates one simple practical embodiment of the invention, but it will be understood that the structure may be modified as regards this disclosure within the true intent and scope of the invention as herein-after defined and claimed.

Fig. 1 is a broken side elevation of a form of the invention as applied to a paste tube type of container, showing the cap in open position.

Fig. 2 is a broken sectional view with the cap shown in the closed position.

Fig. 3 is a top plan view of the parts as shown in Fig. 1.

Fig. 4 is a broken elevation as viewed in the direction of arrow 4, Fig. 2.

Fig. 5 is a view similar to Fig. 2, illustrating a slight modification.

The container to which the invention is applied is here shown as a paste tube 5, of typical design, as regards the contracted end or head portion 6, and the spout or neck portion 7.

The neck structure is distinctive however, in that it has a spherical portion 8, at one side having a radius R drawn for instance from the center of the neck and a spherical portion 9, at the opposite side drawn with the greater radius R' from the same center. This combination of lesser and greater spherical segments, merging one into the other, produce an inclined relatively sharp edge or chime 10, about the discharge throat 11.

The cap or closure proper, comprises a cap member 12, pivotally mounted in this instance, by having side lugs or extensions 13, embracing the neck and provided with inwardly extended pintles 14, entered in pivot sockets 15, in the sides of the neck. In this particular instance, the pivotal axis of the cap is in line with the center of the different curvatures of the neck, but these need not coincide. In some instances, the pivotal center is offset forwardly

or toward the lower side of the neck, that is, to the right in Fig. 1.

The interior or underside of the cap is shown in Fig. 2 as formed on a slant generally corresponding to the inclination at the end of the neck and as having a major curvature 16, at one edge generally corresponding to the higher spherical portion of the neck and a minor curvature 17, at the opposite edge, corresponding in a general way to the lesser spherical portion at the lower side of the neck. Between such curved portions, the cap has a central somewhat spherical protuberance 18, corresponding to the general outline of the inclined end of the throat, in the nature of a rounded pad to extend down into such opening. This rounded protuberance also is of sufficient extent to stress the cap as it is forced over the lower edge of the opening and hence cause the cap to "snap" into its final position, sealing the opening.

For some liquid and pasty materials, a cork or equivalent seal is required. For containers of such materials, the cap may have a disc 19, of cork or other suitable resilient sealing material seated therein. This cork gasket aids the snap action described and, expanding as it does inwardly from the compressed portions held by the sharpened edge of the neck, it aids in holding the cap in the sealed position. To prevent dislodgement, the sealing disc may be seated in a cavity 20, shaped to receive the same in the hollow of the cap. Other means for securing this disc may be employed, or the disc simply be held in place by its engagement and deformation over the center projection of the cap.

The projection of the cap, passing over the low side of the neck and against the high side, serves as a stop limiting further movement. No stops therefore are required to prevent movement of the cap past the fully sealing position.

As a matter of indicating the direction in which the cap opens, a finger recess, such as shown at 21, may be provided, faced to take the pressure of the finger when applied in the proper opening direction.

The cap may be made of the same material as the tube or container, such as lead and tin compositions, or be made for example of the various molded materials commonly employed for tube caps and the like. The manner of hinging the cap may be varied. In the construction illustrated, the pintles are indicated as formed by impressing material from the cap sides into the pivot cavities, leaving the indentations 22, 110

where the material is inset from the outside, in a suitable press.

The spherical end surfaces of the neck and the more or less corresponding cap surfaces with the central protuberance make the closure self-clearing as well as creating the automatic self-sealing and securing action described. The shape of the protuberance may vary in accordance with the end shape of the passage 11. Thus if this passage be square or of flattened rectangular cross-section to cause paste for example, to issue as a thin ribbon or tape, the cap protuberance will be correspondingly shaped, so as to seat and seal in the end of the passage. The radii for the end curvatures need not have the same center and in fact, in some instances as in Fig. 5, the curvature at one side of the neck will be drawn from a different center from the curvature at the opposite side of the neck and be of different radii or as in this special instance, Fig. 5 of the same radii R R. Also, in some constructions, the curvature at the high side instead of being on a longer radius as is the case in Fig. 1, may be on a shorter radius than the curvature at the lower side of the neck. In such construction, the arc would be flatter at the lower side 8 of the neck, facilitating to some extent the sliding movement of the cap thereover. In all such combinations however, it is desirable to have the pivotal center of the cap approximately coincide with the center of curvature at the higher side of the neck, so that the cap will firmly seat in its fully closed position. While the pivotal mounting disclosed is practical, in some instances it is feasible to connect the parts by providing rigid hinge pintles on the cap and to enter these along grooves formed in the sides of the neck, finally closing in these grooves in back of the pintles to thus fix the pintles in the final pivoting position for the cap. According to other methods, pivot pins may be driven through the hinge lugs into anchored position in the neck or a single pivot pin be driven straight through the lugs and neck, scored or roughened at proper points to lock in the material of the neck and with smooth ends for the cap to rock upon. As a variation of the latter, the single pivot pin may have its ends riveted or otherwise secured in the cap lugs and rock in the openings in the neck.

The neck need not be cylindrical and may be elliptical or various angular shapes in cross-section, for example, to match the cross-sectional shape of the passage. Thus with a narrow slot form of passage for discharging the paste as a ribbon, the neck might be elliptical in cross-section, with the axis of elongation on the major dimension of the slot. In such construction, the spherical surfaces at the end of the neck might be elongated in the direction of elongation of the ellipse, with strictly spherical surfaces only at the ends of the ellipse. This elliptical form of neck for ribbon discharge saves material at the sides of the neck and also in enabling a narrower form of cap to be employed.

Various other modifications may be made within the scope of the following claims.

What is claimed is:

1. A closure structure, comprising in combination with a neck having spherical merging end surfaces of different radii at opposite sides of the same, a hinged cap mounted to travel over the surface of lesser radius toward, over and into close fitting engagement with said spherical surface of greater radius.

2. A closure structure, comprising in combination with a neck having end surfaces of different radii at opposite sides of the same, a hinged cap mounted to travel over the surface of lesser radius toward and over the surface of greater radius and having a protuberance entering in the neck between said portions of greater and lesser radius.

3. A closure structure, comprising a neck having spherical portions at opposite sides of different radius and drawn from approximately the same center, providing thereby an inclined sharp edge chime with the portion of lesser radius at the lower end of the incline and the portion of greater radius at the upper end of the incline and a cap pivoted to swing on a center in the region of the aforesaid centers for the radii, said cap having internal curved surfaces at opposite edges registering with and generally corresponding to the spherical curvatures of different radii and having a central protuberance to pass over the spherical surface of lesser radius and to stop against the surface of greater radius.

4. A closure structure, comprising a neck having spherical portions at opposite sides of different radii and drawn from approximately the same center, providing thereby an inclined sharp edge chime with the portion of lesser radius at the lower end of the incline and the portion of greater radius at the upper end of the incline and a cap pivoted to swing on a center in the region of the aforesaid centers for the radii, said cap having internal curved surfaces at opposite edges registering with and generally corresponding to the spherical curvatures of different radii and having a central protuberance to pass over the spherical surface of lesser radius and to stop against the surface of greater radius and a compressible sealing member seated in the cap over said central protuberance.

5. A closure of the character disclosed, comprising in combination, a discharge neck having spherical portions of different radii at opposite sides of the same and a cap pivoted on said neck having portions at opposite edges fitting the neck surfaces of different radii and an intermediate protuberance of sufficient extent to snap over the neck surface of lesser radius.

6. In a closure of the character disclosed, the combination of a discharge neck having merging spherically curved relatively high and low sides and a cap pivoted on the neck on a center approximately coinciding with the center of curvature at the higher side of the neck.

7. In a closure of the character disclosed, the combination of a discharge neck having curved relatively high and low sides, a cap pivoted on the neck at a center approximately coinciding with the center of curvature at the higher side of the neck, said cap having curvatures at opposite edges to fit the curvatures at the higher and lower sides of the neck and having an intermediate protuberance shaped approximately to the cross-sectional shape of the passage at the end of the neck.

8. In a closure of the character disclosed, the combination of a discharge neck having spherically curved relatively high and low sides, a cap pivoted to swing over the lower to the higher side of the neck and internally shaped to substantially fit the spherically curved higher and lower sides of the neck.

9. In a closure of the character disclosed, the combination of a discharge neck having spher-

ically curved relatively high and low sides, a cap pivoted to swing over the lower to the higher side of the neck, internally shaped to substantially fit the spherically curved higher and lower

5 sides of the neck and provided further with an intermediate protuberance of approximately the outline of the end of the passage in the neck.

10 10. In a closure, the combination of a neck having spherically curved merging end surfaces of different radii at opposite sides of the same and a cap hinged to swing over the surface of

one radius toward and over the surface of the other radius.

11. In a closure, the combination of a neck having generally spherical portions at opposite sides of substantially the same radius but struck 80 from different centers and a cap having internal curved surfaces matching said generally spherical portions of the neck and pivotally mounted to cooperate therewith.

CLINTON B. F. BRILL. 85

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20	95
25	100
30	105
35	110
40	115
45	120
50	125
55	130
60	135
65	140
70	145
75	150