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C. E. McMANUS.

BOTTLE SEAL OR CLOSURE.

APPLICATION FILED DEC. 9, 1904.

Fig. 1.

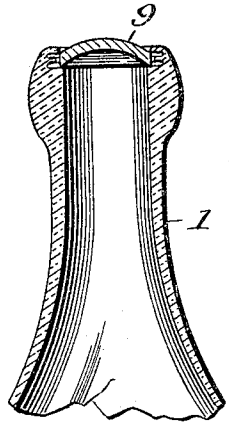


Fig. 5.

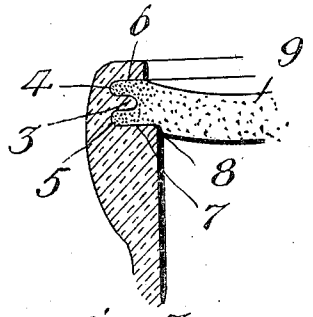


Fig. 2.

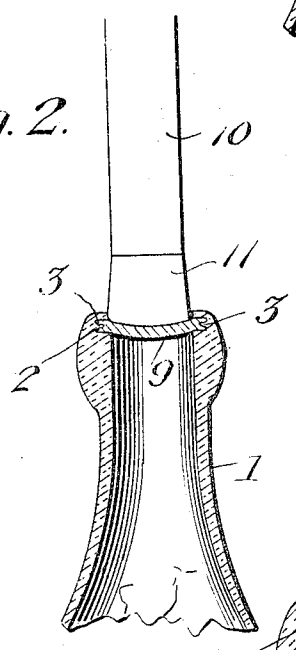


Fig. 6.

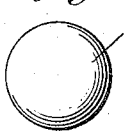


Fig. 7.



Fig. 3.

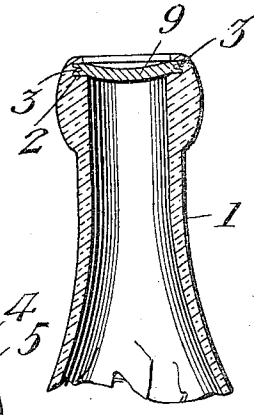
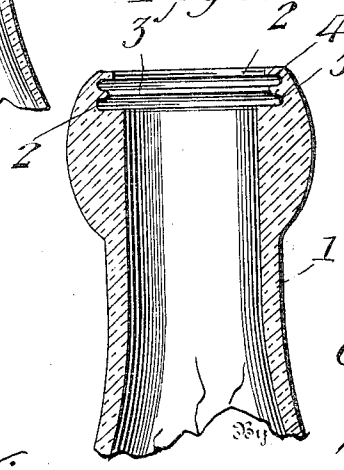


Fig. 4.



Witnesses

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BOTTLE SEAL OR CLOSURE.

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To all whom it may concern:

Be it known that I, CHARLES E. McMANUS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Bottle Seals or Closures, of which the following is a specification.

This invention relates to closures or seals for bottles or other analogous containers, and particularly to closures or seals of that class in which a sealing-disk is employed and forced into engagement with a receiving-groove in the wall of the bottle-neck to retain it in engagement therewith and seal the neck of the bottle securely against the escape of its contents and any gases which may be used to charge the contents.

The object of the invention is to provide a novel construction of bottle-neck and seal which possesses superior advantages in point of simplicity, durability, ease of application of the seal, and the connection of the seal with the bottle-neck in such manner that the pressure of the contained liquid or gases will serve to force the seal more securely in engagement, and thereby effect the retention of the contents of bottles charged to a high degree.

Another object of the invention is to provide a seal of the disk type of special form and characteristics and adapted to coöperate with a receiving-groove in the bottle-neck, which is also of special form and is provided with means whereby when the edge of the disk is inserted therein a tongue-and-groove connection will be formed between the wall of the neck and edge of the disk and the opposite walls of the grooved edge of the disk compressed and forced into engagement with the walls of the receiving-groove, so as to tightly hold the disk against displacement.

A still further object of the invention is to provide a disk which may be easily and cheaply manufactured, which is impervious to moisture, and which when exposed to contact with the confined liquid will slightly swell or become enlarged upon its inner face without affecting the body or outer face thereof, such swelling causing the said inner face of the seal to more securely close the joint between the seal and its receiving-groove.

With these and other objects in view the invention consists of the features of construction, combination, and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section through the neck of a bottle and a bottle-seal constructed in accordance with the invention, showing the latter placed in position in the receiving-groove in the bottle-neck for application to close the neck. Fig. 2 is a similar view showing the seal forced into position to close the bottle-neck. Fig. 3 is also a vertical section showing the seal as it appears when applied. Fig. 4 is a vertical section, on an enlarged scale, through the bottle-neck, showing the construction of the receiving-grooves and interposed tongue. Fig. 5 is an enlarged detail section through one side of the bottle-neck and the adjacent edge portion of the seal, showing the manner in which the latter is held and the tongue-and-groove connection formed when the seal is forced into closed position. Fig. 6 is a top plan view of the seal as it appears prior to application, and Fig. 7 is a sectional view of the same.

Referring now more particularly to the drawings, the numeral 1 designates the neck of a bottle or other suitable container, the wall of which is provided adjacent to its mouth with an internal annular receiving-groove 2, divided by an intermediate circumferential tongue or flange 3, thus forming upper and lower receiving-recesses 4 and 5. As shown, the flange or tongue 3 extends continuously around the groove; but, if desired, it may consist of a series of spaced segments. The tongue 3 has its inner edge rounded, tapered, or pointed to adapt it to serve the function of a divider and spreader, as hereinafter described, and is of less width than the upper and lower walls of the groove. The upper wall 6 extends inwardly to a point slightly beyond the plane of the edge of the tongue; but the lower wall 7 is wider or broader and projects inwardly to a greater extent, thus forming an annular supporting shoulder or seat 8.

The seal or closure 9 is in the form of a flat circular disk of a fibrous composition and is made in practice of somewhat greater thickness than the full depth of the groove 2. In the process of manufacturing these disks

they are cut out to the desired shape from a flat sheet of fibrous material and then subjected to suitable treatment and to the action of a former to impart to the disk a concavo-convex shape, as shown clearly in Figs. 1 and 7. The fibrous composition of which the disk is made adapts it when brought into contact with a liquid to slightly expand or swell at the point where the liquid comes in contact therewith, which characteristic of the seal is made use of to secure a firmer connection of the same with the bottle-neck and a tighter closure of the joint to prevent the escape of gases. The said composition is also of a durable nature and of such close texture as to prevent the escape of gases through the same even when the bottle or other container is charged to a high degree.

In applying the seal to close the neck of a bottle the seal is placed with its concaved face downward into the bottle-neck with its edge projecting into the groove and abutting against the edge of the tongue, as shown in Fig. 1, which operation of placing or feeding the seals into position may be performed by hand or by a suitable automatic feeder. After the seal is placed into position, as described, a plunger 10, preferably formed of steel and having a head 11, composed of rubber or other soft material, and of a size to fit within the bottle-neck, is moved downward into the mouth of the bottle, so that its head 11 will engage the convexed face of the body of the disk and in the preliminary movement of said plunger straighten the disk out. This operation will cause the edge of the disk to be forced inwardly against the tongue or flange 3, the edge of which will cut into or divide the edge of the disk, as shown in Fig. 5, thus forming a tongue-and-groove connection between the disk and bottle-neck. At the same time the flange will also spread the upper and lower walls of the groove thus formed in the edge of the disk and compress the same, thereby forcing them against the upper and lower walls 6 and 7 of the groove 2 and clamping the edge of the disk firmly in position in said groove. The final movement of the plunger will then force the disk to the position shown in Figs. 2, 3, and 5, in which the center or body of the disk is shown as being forced downward below or on an arc whose center lies below the plane of the groove, thus concaving the upper face of the disk and convexing its lower edge, so that the latter will lie just below the plane of the shoulder 8. By this means of applying the disk the disk will be supported beyond its divided edge upon the seat or shoulder 8, whereby it will be firmly supported in position against inward movement. As stated, the fibrous composition used in the manufacture of the disk is of such a nature that a portion thereof when exposed to a liquid will swell or become enlarged. Owing to this characteristic of the material, the lower or concave face of the inserted seal will swell when the contents of the bottle come in contact therewith, thus crowding the lower edge of the seal against the upper edge and inner face of the shoulder 8, so as to hermetically seal the joint at that point and effectually prevent the escape of confined gas or gases employed to charge the contents of the bottle. The seal may be removed when it is desired to discharge the contents of the bottle by the use of any preferred form of extractor.

My improved seal while especially adapted for bottles may be used in connection with containers of any other type.

From the foregoing description, taken in connection with the accompanying drawings, the construction and mode of operation of the invention will be understood without a further extended description.

Changes in the form, proportions, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed as new is—

1. In a bottle-seal, a bottle having a seal-receiving groove, a seal seated in said groove, and means forming a tongue-and-groove connection between the seal and wall of the groove.

2. In a bottle-seal, a bottle having a seal-receiving groove, a seal seated in said groove, and means within the groove for expanding the edge of the seal and fastening it in said groove.

3. A bottle having a seal-receiving recess, a seal having its edge seated in said recess, and means within the recess and engaging the edge of the seal to secure it in position.

4. A bottle having a seal-receiving recess, a seal expanded into said recess, and means for automatically auxiliarly fastening the edge of the seal upon the expansion of the same into the recess.

5. A bottle having a seal-receiving recess, a seal having its edge inserted in the said recess, and a tongue in the recess dividing the edge of the seal and pressing the divided portions into engagement with the walls of the recess.

6. A bottle having a seal-receiving recess provided with a tongue therein to groove the edge of a seal and form a locking connection between the bottle and seal.

7. A bottle having a seal-receiving groove or recess provided with a tongue having a dividing edge to divide or groove the edge of an inserted seal.

8. A bottle having a seal-receiving recess, the lower wall of the recess extending inwardly beyond the plane of the upper wall thereof and forming a seat, and a tongue within the recess and between said walls, and

a seal having its edge inserted in said recess and divided by the tongue, the divided portion of the edge of the seal being clamped by the tongue against the walls and seat of the recess.

9. A bottle having a seal-receiving groove or recess provided with a tongue for grooving and clamping the edge of a seal therein.

10. A bottle having a receiving-recess, a seal having its edge seated in said recess, and means in said recess for simultaneously forming a locking connection with the seal and clamping the same against the walls of the recess.

11. A bottle having a seal-receiving groove or recess provided with means for retaining the edge of a seal therein.

12. A bottle having a seal-receiving groove or recess provided with means for clamping the edge of a seal therein.

13. A bottle having a seal-receiving groove or recess provided with means for grooving and clamping the edge of a seal.

14. A bottle having a seal-receiving groove or recess provided with means for holding the edge of a seal therein in compressed condition.

15. A bottle having a seal-receiving recess provided with means for grooving the edge of a seal and clamping the wings of the grooved portion against the walls of the recess.

16. A bottle having a seal-receiving recess provided with a seal grooving and holding tongue between its upper and lower walls, an inward extension of its lower wall forming a supporting-seat.

17. In a bottle-seal, a bottle having a seal-receiving groove, a seal having its edge seated in said groove, and means in the groove for fastening the edge of the seal therein.

18. A bottle having a seal-receiving recess provided with a seal engaging and retaining tongue set back from the entrance to said recess.

19. A bottle having a seal-receiving recess, a seal seated therein, and means for peripherally interlocking the seal with the wall of the bottle within the recess.

20. A bottle having a seal-receiving recess formed with top and bottom walls, and an integral seal engaging and retaining device intermediate said walls.

21. A bottle having a seal-receiving recess, a seal seated therein, and means within the recess for expanding and wedging the edge of the seal therein.

22. A bottle having a seal-receiving recess, a seal seated therein, and means whereby the action of inserting the seal both seats and locks the edge thereof within the recess.

23. A bottle having a seal-receiving recess, and a seal-fastener arranged in the recess and adapted to engage and fasten the edge of a seal upon the insertion of the same therein.

24. A bottle having an outlet provided with a seal-receiving recess opening at its inner side into the outlet-passage, a seal inserted by expansion into said recess to close the outlet-passage, and means to lock the edge of the seal within the recess when said seal is expanded therein.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. McMANUS.

Witnesses:

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