

W. A. LORENZ.
HERMETIC CLOSURE FOR RECEPTACLES.
APPLICATION FILED FEB. 29, 1904.

Fig. 1

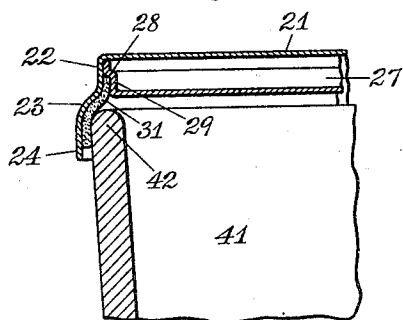


Fig. 2

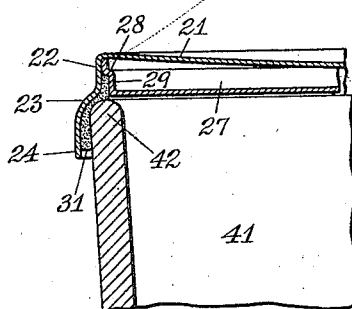


Fig. 7

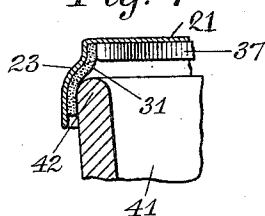


Fig. 3

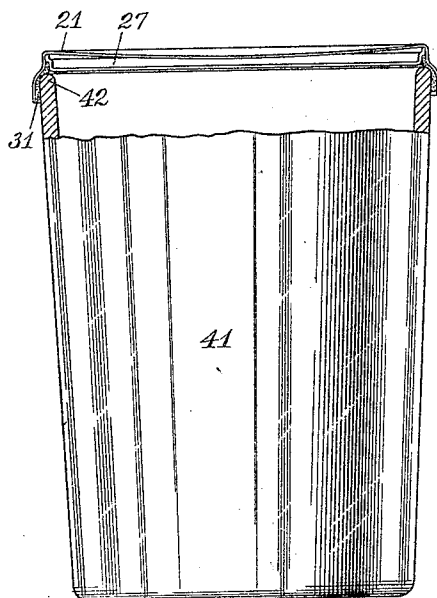


Fig. 4

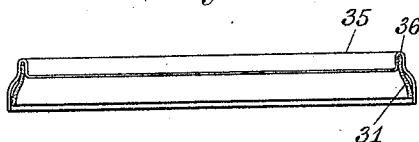


Fig. 5

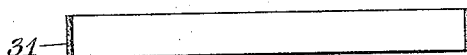
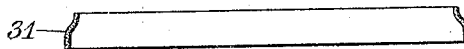


Fig. 6



Witnesses:

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UNITED STATES PATENT OFFICE

WILLIAM A. LORENZ, OF HARTFORD, CONNECTICUT.

HERMETIC CLOSURE FOR RECEPTACLES.

No. 802,003.

Specification of Letters Patent.

Patented Oct. 17, 1905.

Application filed February 29, 1904. Serial No. 195,737.

To all whom it may concern:

Be it known that I, WILLIAM A. LORENZ, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Hermetic Closures for Receptacles, of which the following is a full, clear, and exact specification.

This invention relates to improvements in closures for the hermetic sealing of tumblers and other plain-rimmed receptacles.

The present closure-joint now commonly used for the hermetic sealing of receptacles may be designated as a "wedging" closure, in which the cap is provided with a tapering or flaring flange which engages with and compresses the sealing-gasket at an angle against its sealing-seat upon the receptacle as compared with an older type of closure in which the gasket is compressed directly downward either upon a horizontal shoulder or upon a comparatively thin edge of the receptacle. The superiority of this tapering or wedge form of closure is understood to reside not only in a more reliable initial sealing of the receptacle, but also in the fact that it permits the cap to subsequently settle down and continue its wedging action, thus closely following up the shrinkage or the settling of the gasket due to long-continued pressure without being impeded by any portion of the cap coming against the top of the gasket or the top of the receptacle, as the case may be. The receptacles employing this wedging form of closure usually receive and support the gasket upon the exterior or interior peripheral surface below the level of the rim of the receptacle and are commonly provided with a grooved or shouldered gasket-seat below the level of the rim and upon the inner or outer surface thereof, according as an internal or external cap is to be employed. The horizontal or ledge portion of the seat is intended to insure an approximately level position of the gasket and cap, while the vertical portion is intended to centralize the gasket with the receptacle, and both of these portions cooperate to support the gasket during the sealing operation against the angular wedging action of the tapering or flaring flange of the cap. In either case, however, the shoulder or groove unfits the receptacle for many subsequent household uses which might be served by a tumbler or cup having a plain rim; but the difficulty of applying the wedging closure to these plain-rimmed recep-

tacles has been that they afford no means for positioning the gasket and the flaring cap in such a relation to the inner or outer edge of the receptacle that the downward movement of the cap in making the seal will inevitably catch and pinch the gasket against the rim at the desired wedging angle. On account of the slippery character of the rubber or other material of which these gaskets are usually made they have a strong tendency to escape from the wedging action either by slipping one way or the other over the top of the receptacle-rim. In the present invention this difficulty is overcome by means of a gasket-lined cap, the flange of which is adapted to position the cap and gasket in a central and level position on the plain rim of the receptacle during the air-exhausting operation and also to perform the function of wedging the gasket at an angle against the inner or outer edge of the receptacle-rim in the sealing operation. The sealing-seat is lined with a band-shaped gasket, which is held in place in the cap by friction, due to compression of the gasket, either employing a band, some portion of which is initially larger than the corresponding portion of the sealing-seat, and compressing it in place therein or by providing an annular groove for receiving the upper margin of the gasket, the groove being slightly narrower than the thickness of the gasket, so as to clasp or pinch the upper margin of the gasket, and thereby maintain it.

The accompanying drawings illustrate forms of closure suitable for what may be termed the "outside edge seal," in which the gasket is wedged at an angle against the outer edge of the receptacle-rim.

Figure 1 is a side view in section of one side of this improved closure in position for exhausting the air prior to the sealing operation. Fig. 2 is a similar view of the same parts, showing their position when sealed. Fig. 3 is a side view, in smaller scale, of a sealed tumbler with the upper part shown in section. Fig. 4 is a sectional side view of a modified form of cap. Figs. 5 and 6 are sectional side views of two different forms of the lining-gasket for the cap. Fig. 7 is a fragmentary view showing a modified form of the closure.

The cap 21, made of flexible material, preferably sheet metal, is provided with a comparatively deep flange of a generally-flaring bell-shaped contour. The sealing-seat 23 is inclined at an angle over the outer edge of the

rim 42 of the tumbler 41 to a sufficient extent to serve for leveling the cap upon that rim and also to compress the gasket at the desired angle across the rim in the sealing operation.

5 The inner diameter of the sealing-seat 23 of the cap is larger at the bottom and smaller at the top than the outside diameter of the tumbler-rim to a sufficient extent to enable the lower edge of the gasket to pass freely over

10 the outside of that rim when the cap is in its air-exhausting position, (shown in Fig. 1,) while the upper portion 22 of the seat 23 cannot pass over the outside of that rim when in its sealing position, (shown in Fig. 2,) the

15 plane or level of effective sealing contact being preferably about midway of the flaring portion 23, as shown in the latter figure. The lower or marginal portion 24 of the cap-flange is preferably cylindrical and extends below

20 the level of the tumbler-rim far enough to centralize the cap with that rim, this centralizing of the cap and gasket being an important factor in the positioning of the closure upon the plain rim of the receptacle. The

25 bell-shaped contour of the flange, a portion of which is substantially concentric with the rounded rim of the receptacle, is best adapted for the combined centralizing, leveling, and sealing functions.

30 The lining-gasket 31 is band-shaped, of a substantially uniform cross-section, and may be cylindrical, as shown in Fig. 5, or be molded or otherwise shaped to conform to the interior contour of the cap, as shown in Fig. 6.

35 This gasket forms a compressible lining for the interior sealing-seat 23 of the cap and is held in place therein by friction due to compression of the gasket. Some portion or all of the gasket is made larger in circumference than the corresponding portion of the sealing-seat of the cap, these larger portions of the gasket being compressed circumferentially as it is pushed into position, holding itself in place in the cap by

40 the outward pressure and friction due to its own elasticity, or the gasket may be frictionally held in place in the cap by compressing the upper margin of the gasket outwardly against the cap-flange by means of an inner holder, or both methods may be employed, the

45 compressing or pinching action of the inner holder supplementing the outward pressure of the gasket, due to its own elasticity. The choice of these methods, and when the inner holder is employed the choice of material of

50 which it is made, depends upon the uses and processes to which the closures are to be subjected. If used for dry or cold processing, the inner holder might be made of paper or pasteboard or perhaps be omitted altogether;

55 but in closures intended for steam or hot processing the inner holder, if employed, should be made of material suitable for withstanding the action of the steam. The inner holder may be of metal and, as shown in Fig.

60 4, may be formed integrally with the cap 35

by cupping the top of the cap downwardly, thus leaving a downwardly-opening annular space or groove 36 suitable for receiving and properly compressing the margin of the gasket 31. The gasket may be substantially of

70 the same vertical width as the flange of the cap and extend to the top wall of the cap, as shown in Fig. 7, especially where the cap is comparatively shallow; but for the sealing of glass receptacles, which are liable to be somewhat out of round, it is preferable to employ a cap having a fairly deep flange, the greater flexibility of which enables it to conform more readily to an irregular or oval shaped

75 receptacle; but it is unnecessary to carry the gasket-lining up to the tops of these deeper caps. In fact, it is only necessary to line the sealing-seat. Hence for these deeper caps the inner holders, when employed, may be of the form shown by the holder 27 in Figs. 1,

80 2, and 3. The upper margin of the holder approximately fills the cap and bears against the top wall thereof, and the holder is provided with a shoulder 28 for receiving and positioning the upper edge of the gasket,

85 while the zone 29 is of smaller diameter, leaving a downwardly-facing annular space between it and the interior wall of the cap, forming a groove of a width suitable for receiving and slightly pinching the upper margin of the

90 gasket sufficiently to retain it in place. The inner holder, made of paper, may be paraffined to form a substantially waterproof inner cover for the contents of the receptacle. These inner holders may be circular, as shown in Figs.

95 1, 2, and 3, or may be flat cupped disks, as shown at 37 in Fig. 7. The central portion of the inner holder may be flat or concave in either direction, or it may be cut away, leaving an annular flange.

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In assembling a closure like that shown in Figs. 1 and 2 the inner holder 27 is first put in position in the cap, and then the gasket 31 is pushed into place, with its upper margin entering the groove between the holder and the cap until the upper edge of the gasket is pushed against the shoulder 22. In assembling the form of closure shown in Fig. 7 the gaskets may be first inserted in the caps and the inner holder 37 be pushed into place. A

105 comparatively slight amount of friction is all that is required to hold these gasket-linings in position for ordinary handling.

In sealing tumblers or other plain-rimmed receptacles with this closure the latter is placed upon the tumbler, as shown in Fig. 1, the lower portion 24 of the cap-flange serving to centralize itself with the tumbler, while the flaring or bell form of the sealing-seat of the cap supports the closure in a substantially

120 level position during the air-exhausting operation, at the close of which the cap is pushed down to the position shown in Fig. 2, thereby sealing the tumbler against the readmission of air. The atmospheric pressure on the

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top of the cap forces the latter downwardly and compresses the gasket inwardly at an angle against the outer edge of the rim of the tumbler, thus forming what is herein designated a "wedging closure."

In my prior application, Serial No. 193,705, filed February 15, 1904, I have shown, described, and claimed a closure, broadly, similar to that shown in this application in that it embodies the combination of a gasket and two separate caps provided with flexible flaring rims, one of said caps being inverted within the other cap with the adjacent sides of their respective rims forming the upwardly-converging walls of a downwardly-facing annular groove for positioning the gasket in sealing relation to the outer edge of the receptacle-rim.

I claim as my invention—

1. The combination with a tumbler, of a wedging closure comprising a cap having a flexible flaring rim and a flaring band-shaped lining-gasket for the rim extending downwardly and obliquely outward at a substantial angle across the tumbler-rim, the cap and gasket being supported upon a single zone only of the tumbler.

2. The combination with a receptacle having a rounded rim, of a self-leveling closure

therefor comprising a cap having a bell-shaped flange, a portion of which in cross-section is substantially concentric with the rounded rim of the receptacle, and a gasket-lining for the flange having an internal diameter at its upper portion smaller than the outer edge of the receptacle-rim.

3. A hermetic closure comprising a cap having a flaring internal sealing-seat, a band-shaped lining-gasket therefor, and an inner holder for pinching the upper margin of the gasket against the interior of the cap, and provided with a shoulder for positioning the upper edge of the gasket.

4. The combination with a plain-rimmed receptacle, of a wedging closure therefor, comprising a cap having a flaring internal sealing-seat, lined with a band-shaped gasket, and an inner holder forming an annular groove for receiving and retaining the upper margin of the gasket in position in the cap.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM A. LORENZ.

Witnesses:

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NELLIE PHOENIX.