W. A. LORENZ.

HERMETIC CLOSURE FOR RECEPTACLES.

APPLICATION FILED MAR. 7, 1919.

1,322,914. Patented Nov. 25, 1919.

Fig:-1

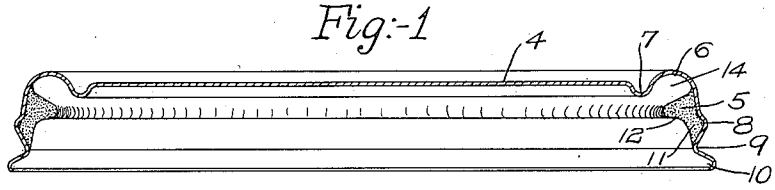


Fig:-2

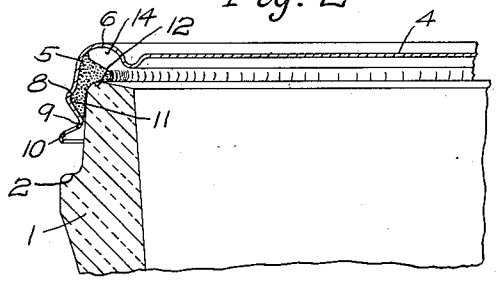


Fig:-3

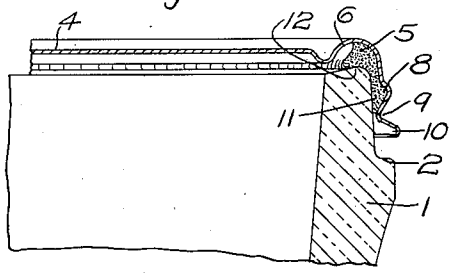


Fig:-4

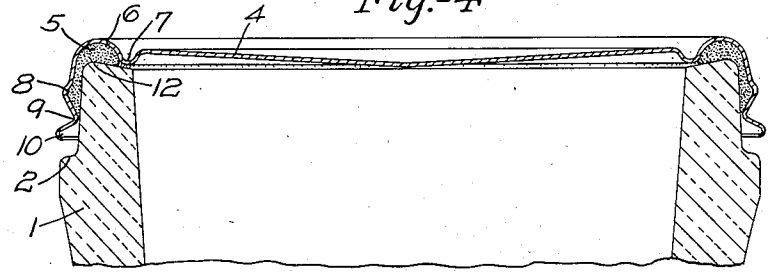


Fig:-5

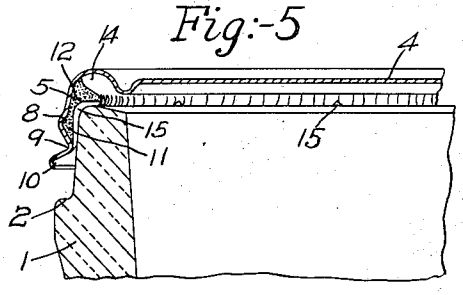


Fig:-6

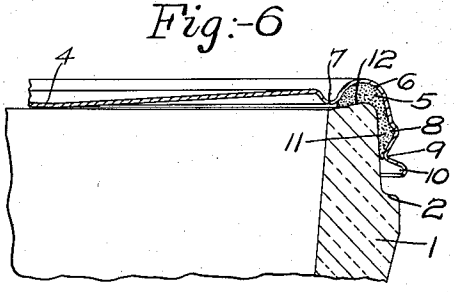


Fig:-7

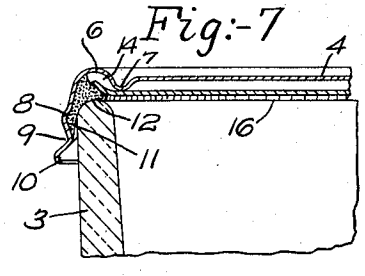
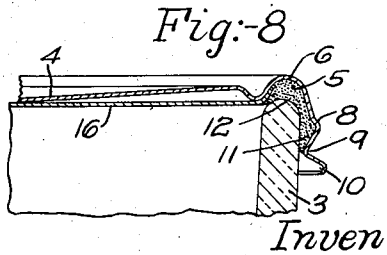


Fig:-8



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HERMETIC CLOSURE FOR RECEPTACLES.

1,322,914. Specification of Letters Patent. Patented Nov. 25, 1919.

Application filed March 7, 1919. Serial No. 281,227.

To all whom it may concern:

Be it known that I, WILLIAM A. LORENZ, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Hermetic Closures for Receptacles, of which the following is a specification.

This invention relates to the construction of closures, and particularly the sealing gaskets thereof, for tumblers, jars, and the like receptacles for containing food products, which are designed to be held sealed by atmospheric pressure.

The object of the invention is to produce a closure of this class comprising a cap and a yielding gasket so shaped that when the closure is placed upon the rim of the receptacle in unsealed position but a relatively small area of the gasket will be in contact with the rim in order to reduce to a minimum resistance to the outflow of air when the package is subjected to the action of an exhausting apparatus, but when the cap is pressed downwardly for sealing the receptacle the gasket will easily flow on the top of and around the outside of the rim so as to embrace an extended area about the mouth of the receptacle and cause a substantial seal.

In attaining this end the gasket is shaped with a portion that will encircle the outside of the rim of the receptacle and with a supporting shoulder that extends inwardly from the encircling portion and will rest lightly upon the rim when the closure is in unsealed position, a space being left above said shoulder between the top of the gasket and the under side of the wall of the recess in the cap in which the gasket is located so that the gasket will, when the cap is pressed down, readily flow downward around the outside of the rim and on the top of the rim and spread and fill said space between the gasket and the cap and complete the seal.

Figure 1 of the accompanying drawings shows a diametric section of a closure that embodies the invention. Fig. 2 is a similar view of the closure resting upon the rim of a jar. Fig. 3 shows the closure partly forced down upon the jar and illustrating the preliminary distortion of the sealing gasket. Fig. 4 shows the closure forced down to final position and hermetically sealing the jar. Fig. 5 shows a section of a closure with a modified form of gasket in unsealed position. Fig. 6 shows the same in its sealed position. Fig. 7 shows a section of the closure in unsealed position on a jar with a paper disk arranged to protect the cap from the contents of the jar. Fig. 8 shows the same in sealed position.

The closure may be used with any common form of glass, porcelain or the like receptacle, as the jar 1 which has an exterior shoulder 2 near the rim, shown in Fig. 5, or the tumbler 3 shown in Fig. 7, and it consists generally of the thin sheet metal cap 4 and the gasket 5 of yielding or semi-plastic compound, of suitable size to fit the receptacle with which it is to be used.

The cap illustrated has in its top an internal or downwardly opening annular groove 6 and an external or upwardly opening annular groove 7. The downwardly extending rim of the cap is shown as having an internal or inwardly opening groove 8 and an external or outwardly opening groove 9, and below these as rolled in for the purpose of forming a smooth edge 10.

The gasket which is formed of elastic or yielding material, preferably a semi-plastic composition which flows or spreads under compression, has a downwardly extending flange 11 designed to occupy the inwardly opening groove 8 in the rim of the cap and encircle the outer wall of the rim of the receptacle, and it has an annular shoulder 12 that extends inwardly from the flange and is designed to rest lightly upon the top of the rim of the receptacle and support the closure when in unsealed position. The upper portion 13 of the gasket, that is, that part above the shoulder, is formed so that it does not fill the groove 6 in the cap when it is placed therein, but leaves a space 14 between the top of the gasket above the shoulder and the under side of the cap.

This closure with the upper portion of the gasket only partly filling the downwardly opening groove in the cap is placed over the mouth of the receptacle to be sealed, with the gasket shoulder resting upon the rim and the gasket flange surrounding the rim, as shown in Fig. 2. Air is exhausted from the receptacle by the usual means and then the closure is pressed down. The first pressure on the closure causes the upper part of the gasket to spread inwardly and partially fill the internal groove in the cap and the flange to flow downward about the rim of the receptacle, as shown in Fig. 3, and then final pressure on the cap causes the gasket to

fully fill the internal groove as far as the wall of the external groove in the cap and flow further down outside of the rim, and complete the sealing of the receptacle, as illustrated in Fig. 4. As a result of leaving a space between the top of the gasket above the shoulder and the inner wall of the top of the cap, the gasket flows easily and spreads widely when the pressure is applied to the cap, so that the gasket will cover a considerable area of the rim of the receptacle and form a substantial seal when the closure is held in place by atmospheric pressure. The wall of the external groove 7 restricts the flow of the gasket and prevents it from spreading inward into the jar too far during the sealing operation, and the wall of the groove 9 in the rim of the cap prevents the gasket from spreading down too far, that is, when these external grooves are provided, their walls restrain the gasket so that it will be compressed into the necessary shape to effect the required seal.

If desired to permit the air to escape more readily during the exhausting operation, the lower or under surface of the gasket may be provided with radial grooves or notches 15, as shown in Fig. 5, which notches, when the closure is pressed down for sealing, are closed together so as to fill up the spaces and make the joint tight, as illustrated in Fig. 6.

For the purpose of protecting the cap, that is, to prevent the contact of the contents of the receptacle with the under side of the cap, a disk of paper or similar waterproof material 16 may be arranged inside of the cap with its edge extending into the space between the top of the gasket and the cap, as shown in Fig. 7. When the cap provided with this protection is forced down, the edge of the protecting disk becomes embedded in the gasket and thus the disk completely shields the cap from the contents of the receptacle, as shown in Fig. 8.

The invention claimed is:

1. A closure consisting of a cap having a gasket recess and a yielding gasket located in and partially filling said recess, said gasket having an inwardly extending flexible flange providing a shoulder adapted to rest upon the top of the rim of the receptacle to be closed and before sealing leave a space between the top of the flange and the under side of the cap, and after sealing entirely fill said space.

2. A closure consisting of a cap having a gasket recess and a yielding gasket located in said recess, said gasket having a downwardly extending portion, an upwardly extending portion, and a flexible flange providing a shoulder extending inwardly intermediate the downwardly and upwardly extending portions and adapted to rest upon the top of the rim of the receptacle to be closed, said upper portion normally only partially filling the space in the gasket recess above said shoulder.

3. A closure consisting of a cap having a downwardly opening groove in the top and an inwardly opening groove in the rim, with a yielding gasket partially filling said grooves, said gasket having an inwardly extending flange forming a flexible supporting shoulder intermediate its upper and lower portions.

4. A closure consisting of a cap provided with a downwardly opening annular groove and a smaller upwardly opening annular groove in its top, with a yielding gasket in said downwardly opening groove, and having an inwardly extending flexible shoulder adapted to rest upon the rim of the receptacle to be closed, said shouldered portion of the gasket being formed so that when the shoulder rests lightly upon the rim of the receptacle there is an unoccupied space in the downwardly opening groove between the under side of the cap and the top of the shoulder.

5. A closure consisting of a cap having a gasket recess, a yielding gasket located in said recess, said gasket having an inwardly extending shoulder adapted to rest upon the top of the rim of the receptacle to be closed and being formed so as to leave a space between the top of the gasket shoulder and the under side of the cap, and a protecting disk arranged beneath the cap with its edge retained in position by the gasket.

6. A closure consisting of a cap having a gasket recess, a yielding gasket located in said recess, said gasket having an inwardly extending shoulder adapted to rest upon the top of the rim of the receptacle to be closed and being formed so as to leave a space between the top of the gasket shoulder and the under side of the cap, and a disk of paper extending beneath the cap and having its edge projecting into the space between the gasket shoulder and the wall of the gasket recess.

7. A closure consisting of a cap having a gasket recess with a yielding gasket located in said recess, said gasket having an inwardly extending shoulder adapted to rest upon the top of the rim of the receptacle to be closed, said shoulder being provided at intervals on its under surface with openings for the passage of air from the interior to the exterior during the process of exhausting the receptacle upon which the closure is placed.

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