L. R. N. CARVALHO AND A. L. MEROLLE.

RECEPTACLE CLOSURE.

APPLICATION FILED MAY 28, 1919.

1,413,256. Patented Apr. 18, 1922.

2 SHEETS—SHEET 1.

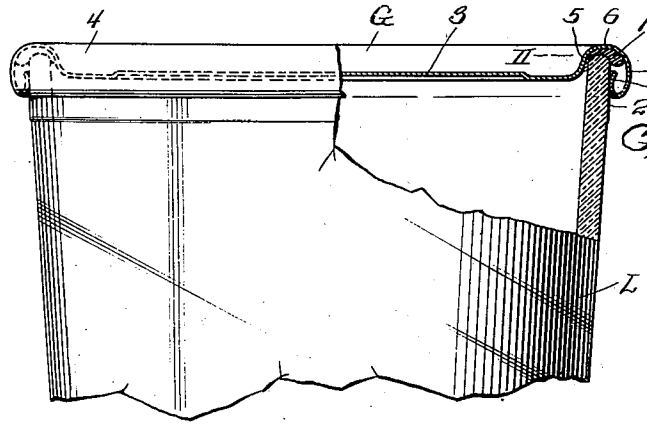


Fig. 1.

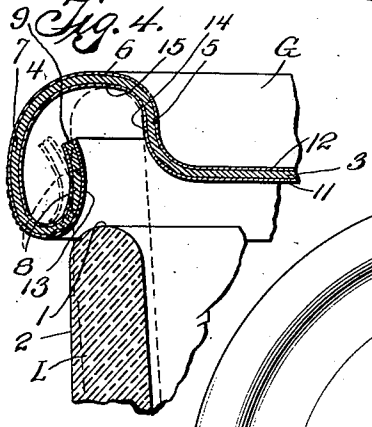


Fig. 4.

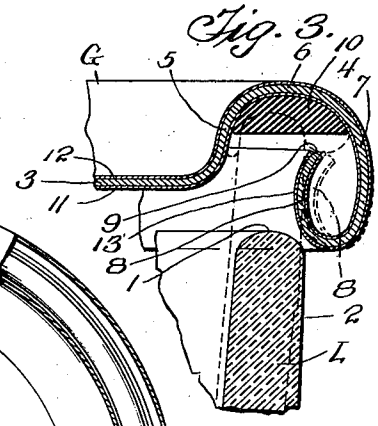


Fig. 3.

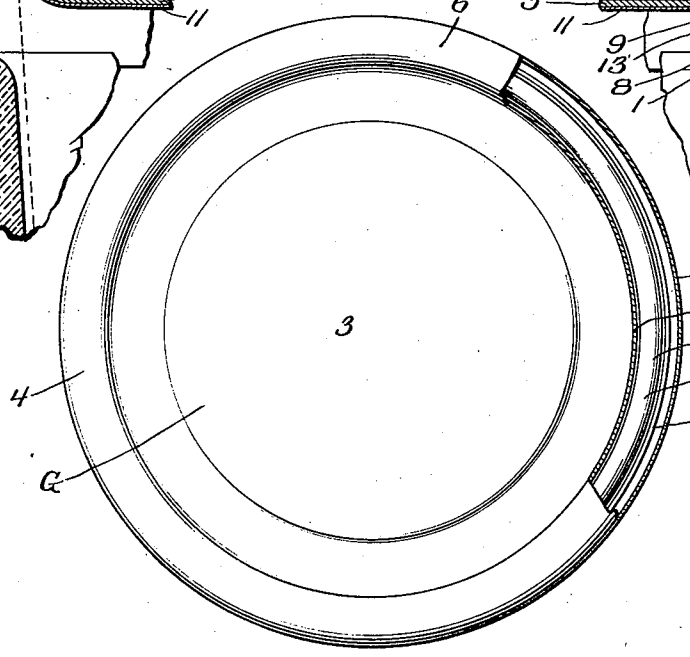


Fig 2.

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2 SHEETS—SHEET 2.

Fig. 5.

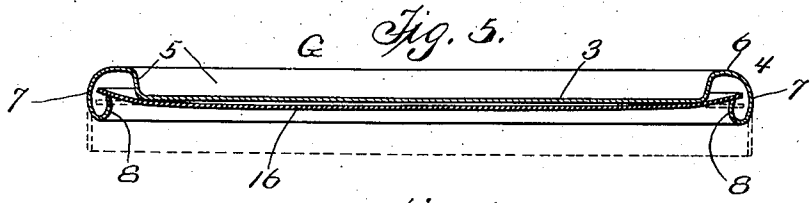


Fig. 6.

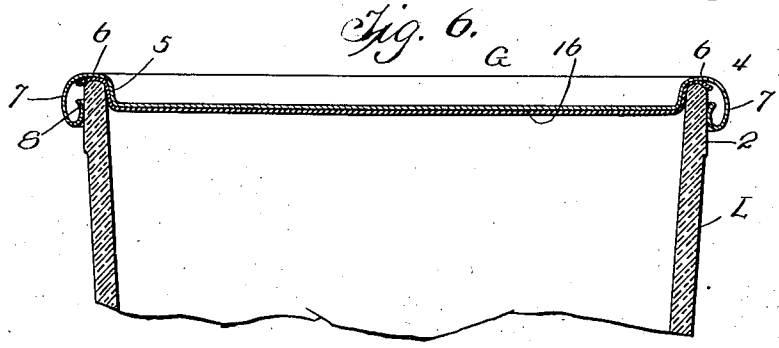


Fig. 7.

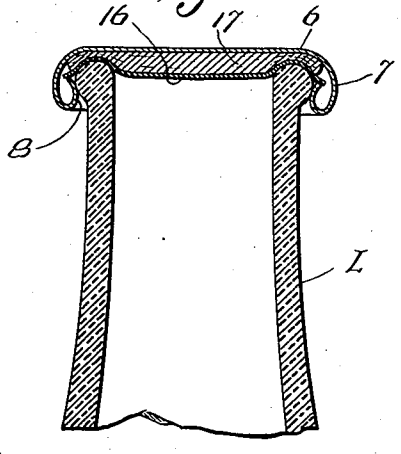
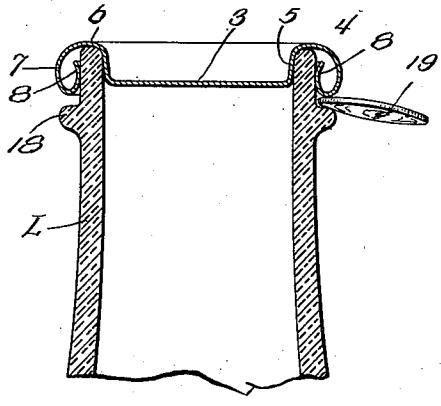


Fig. 8.



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By their Attorney

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UNITED STATES PATENT OFFICE.

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RECEPTACLE CLOSURE.

1,413,256. Specification of Letters Patent. Patented Apr. 18, 1922.

Application filed May 28, 1919. Serial No. 300,462.

To all whom it may concern:

Be it known that we, LESLIE R. N. CARVALHO and AUGUSTUS L. MEROLLE, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Receptacle Closures, of which the following is a specification.

This invention relates to a receptacle closure and the object of the invention is to provide a simple and efficient closure which may be readily attached and which may be depended upon to form an efficient seal for the receptacle.

A further object is to provide a closure which may be applied by the simple application of pressure and which when applied will hold itself on to the receptacles in a satisfactory and efficient manner.

A further object is to provide a closure as above which may be repeatedly used after its initial use.

A further object is to provide a closure which presents on its exterior no raw edges of the material from which it is formed.

A further object is to provide a closure which may be applied with equal efficiency to receptacles of varying sizes.

A further object is to provide a closure having the advantages indicated and which may be fashioned from sheet metal having ornamental paint or lacquer upon one or both its surfaces, the shape of the closure being such that the work of producing the closure will not materially mar the surface coating.

A further object is to provide a closure in which a portion of the material thereof is turned inwardly in such manner that a coating of paint or the like on the upper surface of the closure is presented inwardly so as to engage the receptacle for improving the seal between the closure and the receptacle.

A further object is to provide a closure which is of simple design and yet which affords sealing engagement with the walls of the receptacle at three points; namely, on the outer surface of the wall, on the inner surface of the wall, and on the top edge surface of the wall.

A further object is to provide a closure with separately formed lining material held therein.

A further object is to provide a closure in which a sealing gasket of rubber or other suitable material may be used, and in which such gasket is efficiently held against displacement and against chance of being defaced or destroyed at any time while the closure is detached from the receptacle.

A further object is to provide a closure having the above characteristics and which at the same time may be readily removed whenever desired.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and in part pointed out in the course of the following description of the elements, combinations, arrangements of parts and applications of principles, constituting the invention; and the scope of protection contemplated will be indicated in the appended claims.

In the accompanying drawings which are to be taken as a part of this specification, and in which we have shown merely a preferred form of embodiment of the invention:

Fig. 1 is a side elevational view of a portion of a receptacle illustrating a closure applied thereto constructed in accordance with this invention, a portion of the view being broken away and shown in transverse section.

Figure 2 is a top plan view of the parts shown in Fig. 1, a portion being broken away and shown in horizontal section substantially upon the plane of line II of Fig. 1.

Fig. 3 is an enlarged fragmentary detail sectional view of a portion of a receptacle and a portion of the closure for illustrating the manner of engaging the closure with the receptacle, the receptacle being shown in full lines in its disengaged position and in dotted lines in its engaged position, and

Figure 4 is a view similar to that shown in Fig. 3, but illustrating a slight modification.

Figure 5 is a transverse sectional view illustrating the presence of a separately formed liner.

Figure 6 is a similar view showing the closure with its separate liner applied to a receptacle.

Figure 7 is a transverse sectional view illustrating a modification also in which a separate liner and packing material is present, and

Figure 8 is a similar sectional view illustrating a modification in which the recep-

tacle is provided with means for cooperating with the closure to enable easy removal of the closure.

Referring to the drawings for describing in detail the structure which is illustrated therein, the reference character L indicates the receptacle and the reference character G indicates the closure. The receptacle may be of any desired character but in the instance illustrated consists simply of an ordinary jelly tumbler. The upper annular edge surface of the receptacle is preferably rounded somewhat, as at 1, for facilitating the application of the closure. The outer circumferential surface, as 2, for engagement by the closure is preferably smooth. It is preferably tapered downwardly a very slight degree, although the taper may be omitted if desired.

The closure consists of a single piece of sheet metal shaped to provide what may be termed a body portion 3 and an annular marginal bead portion 4. The body portion 3 is adapted to extend over the open end of the receptacle and the bead 4 comprises the means for receiving and gripping the walls of the receptacle.

The bead 4 consists of an inner approximately vertical wall 5, a top wall 6, an outer approximately vertical wall 7, and an inturned flange 8 formed at the lower edge of the wall 7 constituting in effect a wire edge internally of said wall 7. All of the walls constituting the bead 4 extend continuously and uninterruptedly throughout the circumference of the closure. There are no corrugations, apertures, lugs, or other like features present.

The wall 5 is adapted to stand within the open end of the receptacle and to lie adjacent the inner annular surface of the wall of the receptacle. The wall 6 is adapted to overlie the upper annular edge of the receptacle. The wall 7 is adapted to extend downwardly over the outer surface of the wall of the receptacle and the flange 8 is adapted to constitute a resilient gripping member for frictionally engaging the outer surface of the receptacle, the degree of resilience in the flange 8 being augmented somewhat by the character and relative position of said flange and the wall 7.

All of the walls are gracefully rounded into each other so that the exterior surface of the closure throughout is attractive and unbroken. No parts are present which could in any way injure the hands of an operator attempting to attach or remove the closure. The only raw edge of metal present is that at the upper edge of the flange 8, as at 9, and this is in such a position that the operator's hands cannot possibly reach it. This edge is also so positioned that it is entirely outside the receptacle so that the contents of the receptacle have no access to it.

Any suitable means may be employed as a gasket for more effectually sealing the connection between the closure and the receptacle. A heavy paint of suitable consistency may be applied within the bead 4, or a separately formed gasket, as 10, may be used. It will be noted that where a separately formed gasket is used the same cannot be accidentally displaced since the flange 8 serves as a retainer therefor. The relative location of the surrounding walls 5, 6 and 7, and the location of the flange 8 serve to protect the sealing material against any likelihood of accidental defacement.

In use the closure is simply forced down over the receptacle. The cooperative action which takes place between the receptacle and the closure at this time is graphically illustrated in Fig. 3, wherein it will be seen that prior to the application of the closure to the receptacle the flange 8 stands in its normal position slightly inside the plane of the outer surface of the wall of the receptacle, as shown by the dotted lines Fig. 3. When the closure is applied the flange 8 is sprung outwardly to the dotted line position to allow the receptacle to pass. A very considerable pressure is thus stored in the flange 8 and this pressure continues to be exerted against the outer surface of the receptacle as long as the closure remains applied. As the receptacle presses into the sealing material 10 this material is squeezed so as to complete a very tight joint between the walls 5, 6 and 7 and the adjacent surfaces of the receptacle.

It will be seen in Fig. 3 that a coating of lacquer or the like, as 11, on the inner surface of the closure is unbroken and continues so along the wall 5 and into engagement with the sealing material 10. No raw surface portion of the closure is exposed to the contents of the receptacle.

It will also be noted that a coating of lacquer or the like, as 12, upon the outer surface of the receptacle continues unbrokenly around on to the inner surface of the flange 8 so that when the closure is affixed to a receptacle a portion, as 13, of the coating 12, lies against the outer surface of the receptacle. This portion 13 of the lacquer material serves efficiently to complete a seal between the closure and the receptacle. Any slight irregularities of surface appearing in the wall 8 are closed by this lacquer. The lacquer also adheres to the material of the receptacle and hardens with time so that it constitutes an added means for retaining the closure against accidental displacement.

In the modification, Fig. 4, no sealing material is employed other than that afforded by the paint or lacquer upon the surface of the closure. In this instance it will be seen that a portion of the lacquer, as 14, stands to engage the inner surface of the wall of

the receptacle and a portion, as 15, stands to engage the top edge of the wall of the receptacle. The engagement between the receptacle and the portion 13 is the same as has already been described and it has been found that the seal provided, as shown in this figure, is satisfactorily efficient in many instances. The portion of the wall 5 carrying the lacquer 14 is shaped so as to produce a slight wedge action upon the inner wall of the receptacle when it is forced down into the receptacle and the grip of the flange 8 upon the receptacle serves to hold these parts in the position to which they are moved. The need for bringing a portion of the wall 5 so as to cause the lacquer 14 to press against the inner surface of the wall of the receptacle is not imperative as the engagement between the wall of the receptacle and the flange 8 ordinarily is sufficient, especially where the top wall 6 is brought tightly against the upper edge surface 1 of the receptacle.

The outer surface of the closure may bear any suitable advertisement or ornamentation. This may be put on as a part of the paint or lacquer and it may continue downward over the entire bead 4 since the operation of producing the bead is of such character that the paint or lacquer appearing upon the bead is not materially defaced thereby.

A closure constructed as herein described is capable of use with substantially equal efficiency upon receptacles of varying sizes since the flange 8 is readily bent by the application of the closure to the receptacle. In manufacture the closure is shaped so that its flange 8 is positioned to effect proper sealing of the smallest size receptacle. The application of the closure upon a receptacle of relatively larger size will simply produce a bending out of the flange 8 so as to accommodate the increased size of receptacle. The efficiency of the grip will be maintained. At the same time, of course, the wall 7 may be slightly bent outwardly, thus increasing the ease with which the flange 8 is made to accommodate the receptacle. In fact the wall 7, being of the same material as the flange 8, will yield to a slight extent whenever pressure is brought upon the inner surface of the flange 8 in applying the closure to a receptacle, thus increasing the resiliency of the flange and improving the general operation of the device.

When it is desired to remove the closure from the receptacle the grip of the flange 8 upon the receptacle may be readily relieved to the required extent by tapping upon the outer surface of the wall 7 with any suitable implement, as for instance with the back edge of a table knife. The effect of the tapping will be to flatten out the flange 8 relatively against the inner surface of the wall 7, causing a "set" of the metal at the point where the flange 8 joins the wall 7. The resilient pressure of the flange against the receptacle is thus destroyed and the closure may be readily lifted off. In cases where partial vacuum is present within the receptacle, maintained by the seal between the flange 8 and the receptacle, of course such a vacuum would be immediately relieved by the flattening out of the flange away from the receptacle so that the closure could be removed.

Where it is preferred to remove the closure by direct pressure, it is to be noted that the rounding lower edge of the wall 7 and flange 8 constitutes an ideal surface for receiving the pressure. Any suitable implement may be used for striking blows at this point, or, if the operator prefers to use his fingers there is no likelihood of the fingers being injured by engagement with sharp edges of the material of the closure.

Also it is pointed out that pressure applied directly at the rounding lower edge of the wall 7 and flange 8 tends to coil or bend the flange 8 backwardly upon the wall 7 and away from the receptacle, thus facilitating more easy removal of the closure.

The closure as described consists of three concentric annular walls 5, 7 and 8, the wall, or flange 8 occupies the intermediate position between the walls 5 and 7 and is resilient so that it is capable of movement toward or away from each of said walls 5 and 7. It is directly supported by the wall 7 which is also resilient although to a less degree than the wall 8. The receptacle is held between the walls 5 and 8 and the wall 5, in addition to its function of affording a seal engaging the receptacle, serves as an abutment assisting the receptacle to resist the pressure of the wall 8. This is essential since it tends to decrease the likelihood of breaking the receptacle when the closure is applied.

The presence of the wall 5 as an abutment is also important since it prevents the likelihood of breaking the receptacle when blows are struck upon the outer surface of the wall 7 to loosen the closure as above referred to.

The raw edge 9 of the flange or wall 8 is not only protected from contamination by the contents of the receptacle and from causing injury to an operator's hands, but it is also itself protected against the deteriorating effects from the atmosphere either inside or outside of the receptacle, this because it occupies a position within a sealed enclosure produced by the seals of the wall 8 and the gasket 10 against the receptacle. The likelihood of corrosion of the edge 9 is, therefore, diminished so that there is little likelihood of particles of rust or the like at any time falling from the closure into the receptacle upon removal of the closure.

By referring to Figs. 5, 6 and 7 it will be seen that this invention contemplates further the use of separately formed liners for the closure.

Of course the material constituting the liner may be of any appropriate character, but as an illustration the drawing shows, in Figs. 5 and 6, a liner 16 which consists preferably of a sheet of oiled, or otherwise suitably treated paper. This liner is in the form of a disc of suitable size to fit within the space defined by the wall 7. It covers the entire inner surface of the body of the closure, and when the closure is applied to the receptacle, as seen in Fig. 6, the marginal portions of the liner are forced upwardly against the walls 5 and 6 so that these marginal portions serve effectually to provide a seal between said walls and the receptacle. In instances where the material employed for the liner is of suitably soft consistency so that the wrinkles caused therein by bending against the walls 5 and 6 are smoothed out under the pressure applied the seal is of especial efficiency. A paper or the like, coated or impregnated with such material as paraffin, or oil, is admirably adapted for producing a perfect seal.

In applying this liner within the receptacle the same is preferably placed in position between the wall 7, as illustrated by the dotted lines in Fig. 5, before the wall, or flange 8 is turned in. At this time the liner is readily positioned and the turning in and the wall 8 is not interfered with in any way. When the wall 8 has been turned in its edge preferably engages the marginal portions of the liner and holds the liner against dislodgment, as clearly seen by the full lines in Fig. 5.

In Fig. 7 the liner 16 therein is backed by a disc, as 17, of resilient material such as cork or the like. The disc 17 overlies the upper annular edge of the receptacle, and the overlying portion is adapted to be compressed when the cap is applied to the receptacle. In this instance the central portion or body of the cap is preferably not depressed as in the structures already described, it being found that the resilient material 17, by fitting closely to the contour of the upper edge of the receptacle, avoids necessity for depression of the central part of the closure. In other respects the closure illustrated in this figure is substantially the same as already described, and it is particularly to be noted that the resilient wall 8 shown in this figure is illustrated in cooperation with the rounding under surface portion of an annular bead on the receptacle. Such beads are commonly employed upon receptacles such as bottles and the like, and the closure of this invention is as readily applicable to such receptacles as to those already described.

In the modification Fig. 8, the closure is substantially the same as is illustrated in Fig 1. In this instance, however, the receptacle is shown to be provided with an annular bead, as 18, positioned adjacent to but spaced slightly below the lower edge of the closure. A bead of this character upon the receptacle serves as a guard preventing likelihood of blows being unintentionally struck against the under portion of the closure tending to dislodge the closure. At the same time the space between the closure and the bead is admirably adapted to receive the edge of a suitable implement, such as the blade of a table knife, or the edge of a coin, as 19, in a position so that the implement can be used effectively to pry the closure upwardly.

It is to be noted with respect to the illustration Fig. 8, that a certain cooperative relation exists between the bead upon the receptacle and the closure of this invention; namely, that when the implement is moved with the bead as a pivot the prying action is exerted upon the lower edge of the resilient wall 8 of the closure in a manner tending to lift of coil the wall away from the receptacle at the same time that the closure is being moved upwardly.

As many changes could be made in this construction without departing from the scope of the invention as defined in the following claims, it is intended that all matter contained in the above description, or shown in the accompanying drawings, shall be interpreted as illustrative only and not in a limiting sense.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. A receptacle closure having a marginal portion adapted to overlie an exterior portion of the receptacle, a coating upon the exterior surface of said marginal portion of the closure member, the lower edge part of said marginal portion having said coating thereon being bent inwardly and upwardly, and said bent part constituting resilient gripping means adapted to press its coating against the receptacle.

2. A receptacle closure having a marginal portion adapted to overlie an exterior portion of the receptacle, said marginal portion of the closure having a portion extending therefrom bent to constitute receptacle gripping means disposed in a position between the receptacle and said mentioned marginal portion of the closure, and a sealing medium carried by said receptacle gripping means disposed to be pressed by said gripping means against the receptacle.

3. A receptacle closure comprising a body part having an annular bead formed thereon, the bead providing a surface portion for engaging the inner annular surface of the

receptacle, the bead providing another portion resilient for engaging the outer annular surface of the receptacle, and a sealing medium carried by said parts of the bead disposed for engaging against said parts and the receptacle.

4. A receptacle closure made from a single piece of sheet material, coatings upon both the upper and lower surfaces of said piece of material, said piece of material being shaped to provide parts for engaging the receptacle, and said shape being such as to dispose portions of the coatings upon the two surfaces of said sheet of material to constitute sealing means engaging the receptacle in different localities.

5. The combination with a receptacle having an annular bead formed exteriorly thereof, of a closure for the receptacle comprising a body portion overlying the open end of the receptacle, a marginal wall depending about the receptacle, and a resilient gripping portion disposed between the marginal wall and the receptacle and having a portion disposed adjacent to said bead adapted to receive pressure from a suitable implement engaging said bead to displace the closure.

6. The herein described process of manufacturing preformed receptacle closure having a gasket therein, which consists in providing a body portion having an annular flange upturned thereon, positioning the gasket within the space defined by said annular flange, and then bending the edge portion of said annular flange inwardly to provide a resilient gripping means for gripping the receptacle, said gripping means also engaging portions of the gasket to retain the gasket against displacement all prior to application of the closure to a receptacle.

7. As an article of manufacture, a receptacle closure comprising a body part having its marginal portion shaped to provide three concentrically disposed walls one of which walls is of a character adapted when the closure is applied to a receptacle to serve as gripping means for gripping the receptacle.

8. As an article of manufacture, a receptacle closure comprising a piece of material shaped to provide two concentrically disposed walls one being formed from the marginal portions of said piece of material and the other being formed by the portion of said piece of material lying adjacent the marginal portion, said first mentioned wall being resilient and adapted to be sprung outwardly by application of the closure to a receptacle so as thereby to serve as a resilient frictional gripping means for gripping the receptacle, and the second wall being adapted at the same time to engage a portion of the receptacle at a locality to assist the receptacle in resisting the pressure of the gripping means.

9. As an article of manufacture, a receptacle closure comprising a body part having its marginal portion bent to provide three concentrically disposed walls surrounding the body part and spaced from each other, and the intermediate wall being of a character to serve as gripping means for gripping the receptacle.

10. As an article of manufacture, a receptacle closure comprising a body part having its marginal portion bent to provide three concentrically disposed walls surrounding the body part and spaced from each other, and the intermediate wall being resilient and adapted to be pressed toward one of said other walls when the closure is applied to a receptacle.

11. A receptacle closure comprising a body part having its annular marginal portion bent first upwardly to provide an upstanding annular wall, said marginal portion being bent thence outwardly and downwardly and thence inwardly and upwardly to provide resilient gripping means disposed for engaging the receptacle, and a liner for the closure comprising a disc of sheet material underlying the body portion and having its annular marginal portion projecting beyond the upstanding wall of the body portion and into engagement with the upper edge of the inwardly and upwardly turned portion of the body being held against displacement by said last mentioned engagement and being adapted upon application of the closure to a receptacle to be bent upwardly by the receptacle to provide sealing means between the receptacle and the adjacent surface portion of said upstanding wall of the body.

In testimony whereof we affix our signatures in the presence of two witnesses.

LESLIE R. N. CARVALHO.
AUGUSTUS L. MEROLLE.

Witnesses:
L. GESSFORD HANDY,
MAY SCHULZ.