Sept. 22, 1925. 1,554,749

A. L. MEROLLE

RECEPTACLE CLOSURE

Filed Sept. 30. 1924

Fig. 1.

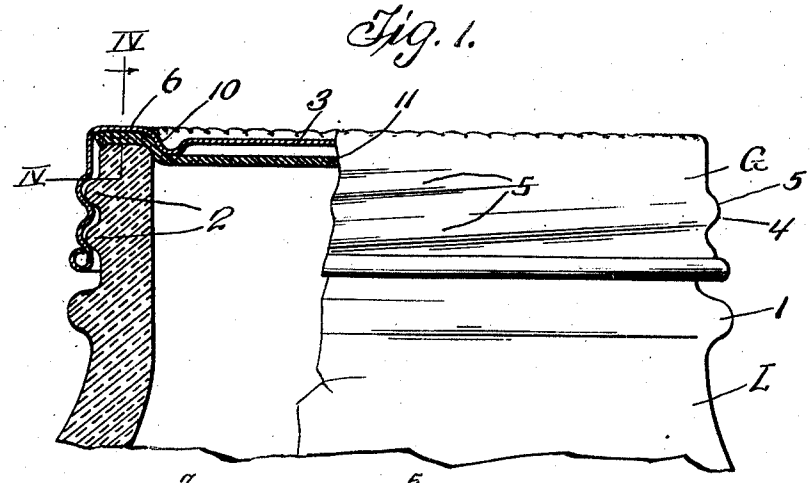


Fig. 2.

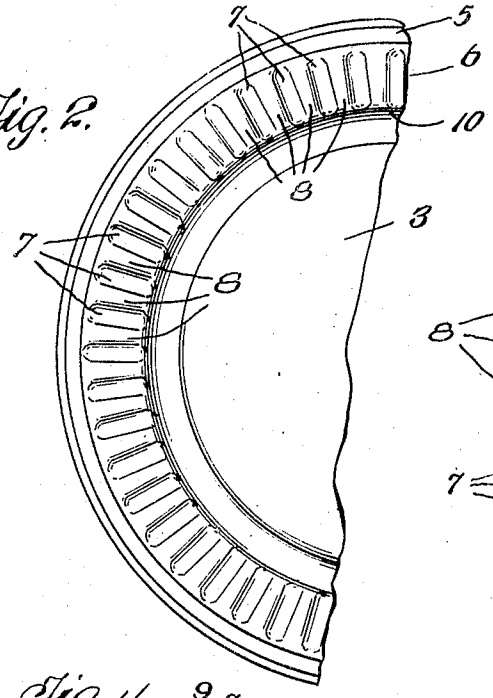


Fig. 3.

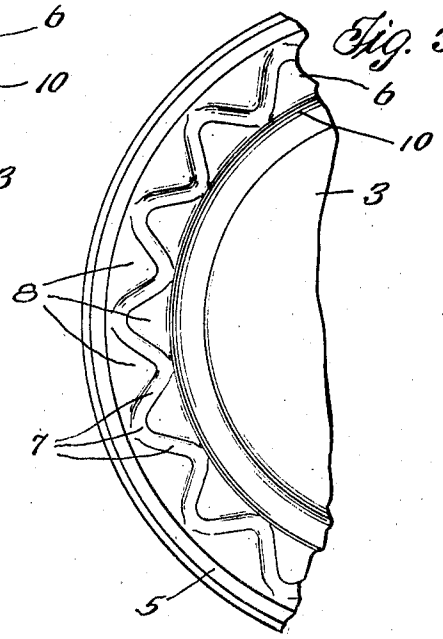
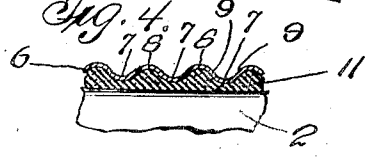


Fig. 4.



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UNITED STATES PATENT OFFICE.

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RECEPTACLE CLOSURE.

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To all whom it may concern:

Be it known that I, AUGUSTUS L. MEROLLE, a citizen of the United States, and resident of 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 an object of the invention is to provide a closure of the simple single thread screw type and in which means is provided for enabling ready removal of the closure.

A further object is to provide a cap which may be very easily and cheaply manufactured and which may be readily loosened from sealing position upon the receptacle by striking against the cap with a suitable instrument to distort portions of the cap from their normal conditions.

A further object is to provide a cap which has parts adapted to be distorted by being struck so as thereby to loosen the cap, and to arrange said parts in such relation to the receptacle that the act of striking said parts will be not likely to injure or break the receptacle.

A further object is to provide a cap in which the portion thereof subjected to direct sealing pressure in use comprises distortable corrugations.

A further object is to provide a cap in which the portion thereof which exerts sealing pressure against the receptacle is partly corrugated and partly uncorrugated.

A further object is to provide a cap in which the portion thereof which is designed to exert a direct downward pressure against the upper annular edge of the receptacle is made up of distortable corrugations, and in which an uncorrugated portion is provided for exerting a wedge-like diagonal pressure against the receptacle to provide a proper seal for the receptacle.

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 I have shown merely a preferred form of embodiment of the invention:—

Fig. 1 is a side elevational view, partly in section, of a closure and illustrating the same as applied onto a receptacle.

Fig. 2 is a top plan view of a portion of the closure appearing in Fig. 1.

Fig. 3 is a similar top plan view but illustrating a modified form of the distortable corrugations, and

Fig. 4 is an enlarged fragmentary detail sectional view taken upon the line of IV—IV of Fig. 1.

Referring to the drawings for describing in detail the structure therein illustrated, the reference character L indicates the receptacle, which is of course open at its upper end and which is preferably provided with an annular outstanding bead 1 thereon spaced downwardly from the upper end of the receptacle. Between the bead and the upper end of the receptacle there is provided the usual outstanding thread or threads 2 with which the closure is intended to engage by inter-rotation of the receptacle and closure in the usual manner.

The reference character G indicates generally the closure device, the same being made up of a cover part 3 and an annular marginal flange 4 provided thereon for depending about the exterior of the receptacle. The entire closure is formed from a single piece of sheet metal pressed or drawn into shape, and the flange portion thereof is pressed to provide the thread or threads as 5 therein for engaging the thread or threads 2.

It should be here noted that the flange portion of the present cap may be made up in any appropriate form and may be provided with a single continuous thread for engaging a cooperative single thread on the receptacle, or it may be provided with divided threads, or thread lugs, for cooperating with divided threads or thread lugs provided upon the receptacle, or otherwise. The drawing herein however illustrates a single thread receptacle and closure since such closures are ordinarily the most difficult to remove and since therefore the value of the present improvement will be most clearly apparent.

The annular portion 6 of the cover part 3 which directly overlies the upper annular edge surface of the receptacle, and which therefore exerts a direct downward pressure

against the edge surface of the receptacle, is formed with, or made up of, corrugations which are preferably provided by bending in portions as 7—7 so as to stand closer to the receptacle than the intermediate portions 8—8, and so as thus to provide diagonally disposed wall portions as 9—9 connecting the portions 7 and 8 together. The formation of these parts is produced by stretching of the metal and particularly of the metal in the connecting wall portions 9—9 so that the full resiliency of the metal is to a certain extent destroyed.

When the cap is screwed downwardly onto the receptacle the under surfaces of the parts 7—7 will engage directly against the material of the receptacle, or against the gasket if such be employed, and will be subjected to direct upward pressure tending to return them to their normal positions in the plane of the portions 8.

The pressure which may be exerted by forced rotation of a single thread cap may easily be sufficient to even partly return the portion 7 upwardly to the plane of the portions 8, and it will therefore be apparent that in all average cases the additional force required to return the portions 7 to a sufficient height for loosening the cap threads from the receptacle threads may be readily applied in the form of light blows struck by a suitable instrument, as for instance a knife handle, downwardly against the upper surface of the portions 8. These blows will cause the stretched metal in the portions 9, already under considerably crushing strain, to yield and return to a "set" condition with the portions 7 relatively elevated.

In striking downwardly upon the upper surface of the portion 6, or upon the upper annular edge of the flange portion 5, that is upon the angular juncture between the portions 5 and 6, each blow thus struck will of course not only produce a "set" of the corrugations in a flattened condition but will also cause a certain and definite momentary downward movement of the adjacent portion of the flange and thus cause said portion to release the adhesive grip which it may have secured upon the receptacle due to the presence of rust or corrosion or to the presence of lacquer or other coating between the metal of the flange and the surface of the receptacle.

Furthermore it should be noted that the blows struck downwardly against the portion 6 will be felt by the receptacle as blows downwardly against the upper annular edge thereof and thus from a direction in which the receptacle is the best able to absorb the blows without probability of injury to the receptacle.

In order to release the present closure it will be necessary only to strike a few light blows downwardly against the upper surface of the corrugated portion 6 at spaced points circumferentially thereof, and it will be apparent that the tighter the closure has been screwed onto the receptacle, and consequently the greater the crushing strain present upon the portions 9 of the corrugations, the easier will the closure succumb to the effect of the blows applied.

The annular portion 10 of the cover part 3 just within the circle defined by the corrugated portion 6 is turned diagonally downwardly so as to provide an outwardly facing diagonal surface for engaging, with a wedge-acting force, against the inner annular corner surface of the receptacle. Since these portions of the closure and receptacle are smooth and uncorrugated they may be depended upon to provide an appropriate seal in some instances without an interposed gasket, but preferably a gasket disk as 11 is employed which extends into position between said surfaces and provides a positive and efficient seal therebetween.

The gasket 11 has its marginal portion preferably extending also into position between the upper edge surface of the receptacle and the under surface of the corrugated portion 6 and is preferably of suitably plastic or yieldable material so that it will permit the depressed portions of the corrugations to become embedded therein and so that its portions between the depressed portions of the corrugations will bulge upwardly and fill the raised portions of the corrugations, as most clearly seen in Fig. 4, thus providing a further efficient seal between the receptacle and the closure.

A certain amount of wrinkling which will be occasioned in the marginal portions of the gasket 11 due to the lateral bending thereof about the wedge-acting sealing surface 10 will be readily located and accommodated between the depressed portions 7 of the corrugations. Where the gasket is employed a certain amount of pressure may be felt there through by the raised portions of the corrugations but not in sufficient force to in any material extent interfere with the return "setting" of the portions 9 in the manner as above set forth.

In the modification Fig. 3, the structure is identical in all respects to that above set forth except that in this instance the corrugations of the portion 6 take the form of a single line of depression extending zig-zag across the portion 6 and circumferentially thereof. In this form of corrugation the depressed portions extend transversely across the edge of the receptacle but provide a continuous line of depression throughout the circumferential length of the edge of the receptacle and may in this way furnish a more efficient seal between the closure and said upper edge of the receptacle and thus relieve the wedge-acting sealing portion 10

of a greater proportion of its responsibility.

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.

In the structures of both Figs. 2 and 3, the under surfaces of the depressed portions 7 of the corrugations only provide a direct pressure against the upper edge surface of the receptacle and since these under surface portions are of only small extent they provide a much less friction hold upon the surface of the receptacle than would be the case if the portions 6 were left smooth and uncorrugated. The provision of the corrugations therefore contribute largely in rendering this cap readily removable.

It is a matter of importance also to note that the corrugations provided upon the portions 6, and extending, as they do, transversely thereof to closely adjacent the upper edge of the flange 4, while being of such a character as to be readily collapsed or distorted when struck are nevertheless of such strength that they will not give or collapse to any appreciable extent under the pressure which is ordinarily incident to the forced inter-rotation of the cap and receptacle. It is intended that they shall be in fact sufficiently strong so that they will stand up under this latter pressure even where said pressure is carried to such an extent as to cause some distortion of the threads 5 on the flange. By making the corrugations thus relatively stronger, against the normal distorting strains, than the threads it will be apparent that the corrugations will maintain their shape while being operated upon as hereinabove set forth and yet that the threads will give and yield as may be required to enable them to properly conform to the exact contour of the threads of the receptacle and thus properly interengage and cooperate with said threads.

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

1. A receptacle closure comprising a cover part and a flange part, means comprised in the flange part by which to urge the cover part downwardly against an upper edge surface of the receptacle, and the seal-forming portions of the cover part overlying the annular edge of the receptacle having conformations adapted to be distorted by blows struck downwardly thereon towards said edge to thereby release the flange part from the receptacle.

2. A receptacle closure comprising a cover part and a flange part, means comprised in the flange part by which to urge the cover part downwardly against an upper edge surface of the receptacle, and the seal-forming portion of the cover part overlying the annular edge of the receptacle having corrugations provided thereon manually distortable to release the flange part from the receptacle.

3. A receptacle closure comprising a cover part and a flange part, means comprised in the flange part by which to urge the cover part downwardly against an upper edge surface of the receptacle, and the seal-forming portion of the cover part overlying the annular edge of the receptacle being bent to provide a plurality of depressed parts therein spaced apart around said portion extending toward the receptacle to receive pressure therefrom, and the material comprising said depressed parts being distortable by blows struck thereagainst to render said depressed parts less deep and thereby release the flange part from the receptacle.

4. A receptacle closure comprising a cover part and a flange part, means comprised in the flange part by which to urge the cover part downwardly against an upper edge surface of the receptacle, and the seal-forming portion of the cover part overlying the annular edge of the receptacle being bent to provide a plurality of wall portions arranged to receive pressure from the receptacle and being disposed at an angle to the direction of said pressure so as thereby to render said walls readily manually distortable by blows struck downwardly thereagainst for relieving said pressure and thus releasing the flange part from the receptacle.

5. A receptacle closure comprising a cover part and a flange part, means comprised in the flange part by which to urge the cover part downwardly against an upper edge surface of the receptacle, and the seal-forming portion of the cover part overlying the annular edge of the receptacle being corrugated by corrugations which extend transversely of said edge and which are readily distortable by blows struck downwardly thereon toward said edge for thereby releasing the flange part from the receptacle.

In witness whereof I affix my signature.

AUGUSTUS L. MEROLLE.