Nov. 24, 1936. A. L. MEROLLE 2,062,271

RECEPTACLE CLOSURE

Filed Nov. 22, 1933 2 Sheets-Sheet 1

Fig.-1

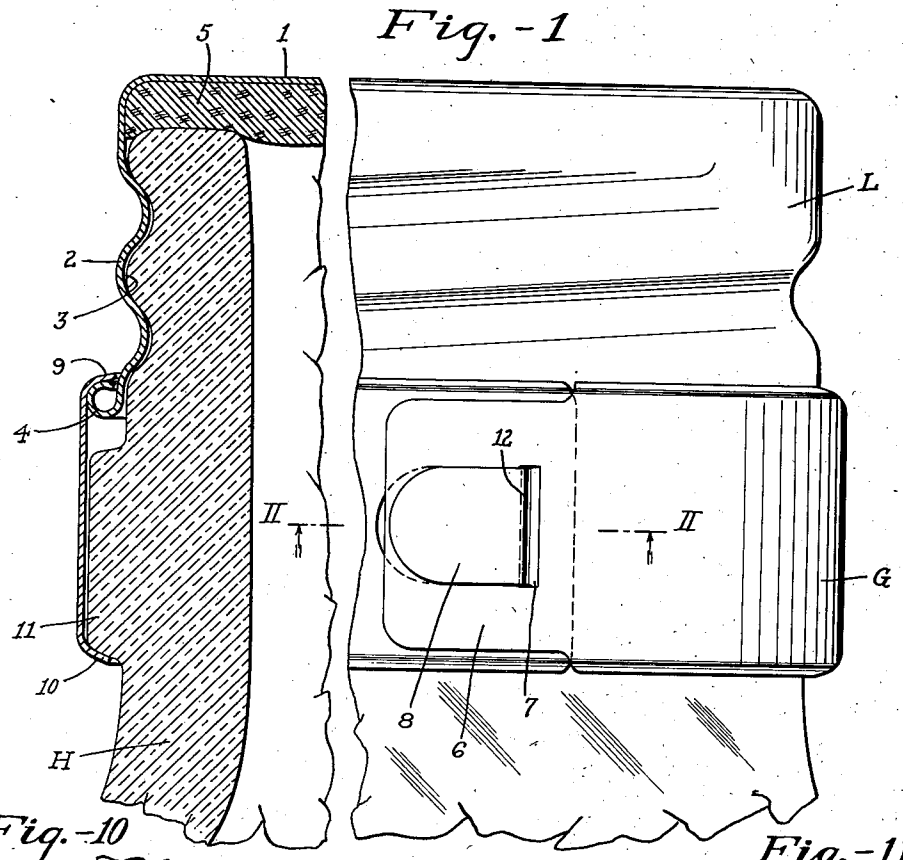


Fig.-10

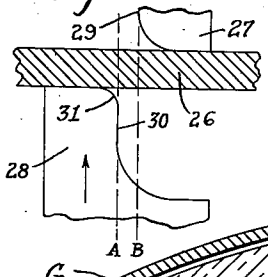


Fig.-2

Fig.-11

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Fig. - 3

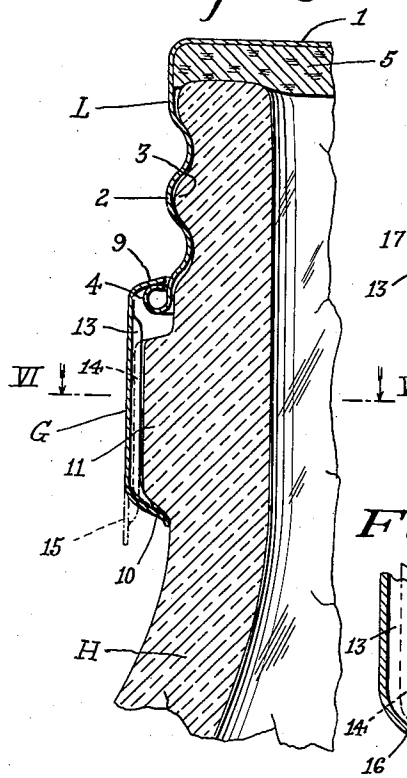


Fig. - 4

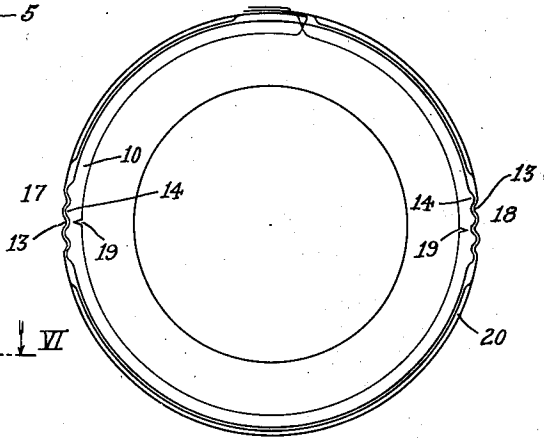


Fig. - 5

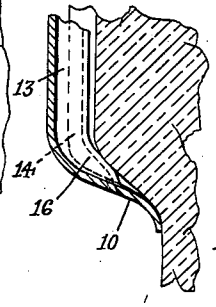


Fig. - 6

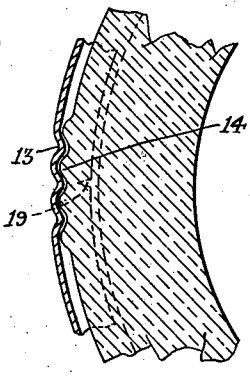


Fig. - 7

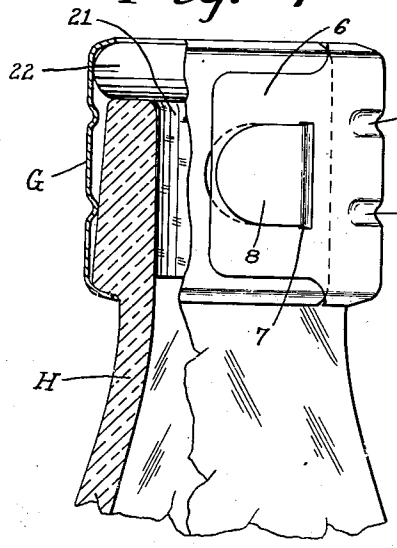


Fig. - 8

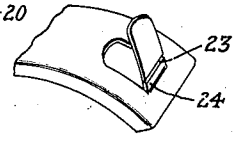
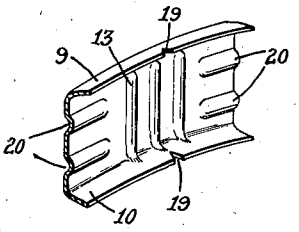


Fig. - 9



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Patented Nov. 24, 1936 2,062,271

UNITED STATES PATENT OFFICE

2,062,271

RECEPTACLE CLOSURE

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Application November 22, 1933, Serial No. 699,182

6 Claims. (Cl. 215—95)

This invention relates to a receptacle closure and particularly to a closure which when once unsealed can not be again restored to its original condition but which will include a part adapted to serve thereafter as a temporary sealing element.

An object of the invention is to provide a closure of the type indicated which will include two separate elements one being a closure element proper and the other being a sealing or retaining element for the closure element, the sealing element being removable in its entirety and being not returnable but the closure element being of a character adapted for repeated use.

A further object is to provide a sealing or retaining element as indicated and which will include features enabling its easy removal but preventing its re-use.

A further object is to provide a retaining element or band of a character such that it may be made from a strip of sheet metal and having interlocking connections between its opposite ends of a character easily separable to permit removal of the retaining element or band but adapted to become broken or otherwise deformed if effort be made to return it to an interlocking engagement.

A further detailed object is to provide a retaining band as indicated having a tongue portion at one of its ends for engagement through an aperture in its other end, and to make said tongue with a weakened root so that while the tongue may be bent once it will be subject to fracture at its root if bent a second time.

A further object is to provide a locking tongue as indicated, and having a root portion consisting of a section of the metal comprising the tongue stretched to near the breaking point.

A further object is to provide means to prevent rotary movement of the retaining band upon the receptacle.

A further object is to provide means to insure a tight clamping engagement of the retaining band against relatively under portions of the receptacle when the band is in retaining position.

A further object is to so construct the retaining band that any such radial spreading thereof as is necessary to enable its disconnection from the closure element will result in providing a permanent visual indication of said spreading.

A further object is to so construct the retaining band that it will include one or more regions of weakness circumferentially of itself likely to deformation incident to any such radial spreading of the band as is necessary to release the band from the closure element.

A further object is to provide an improved method of forming a locking tongue with a weakened root.

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 of a receptacle closure constructed in accordance with this invention and showing the same as it appears in position upon a receptacle constructed to receive it, a portion of said figure being broken away and shown in vertical section.

Fig. 2 is an enlarged horizontal fragmentary sectional view substantially upon the plane of line II—II of Fig. 1.

Fig. 3 is a vertical sectional view similar to a portion of Fig. 1 and illustrating a means cooperative between the retaining band and the receptacle to hold the band in tight non-rotatable engagement with the receptacle.

Fig. 4 is a diagrammatic view substantially upon the plane of line VI—VI of Fig. 3 and clearly illustrating the manner in which the structure Fig. 3 is operable to prevent inter-rotation of the retaining band and the receptacle.

Fig. 5 is an enlarged fragmentary sectional view similar to a portion of Fig. 3.

Fig. 6 is a similarly enlarged fragmentary horizontal sectional view upon the plane of line VI—VI of Fig. 3.

Fig. 7 is a side elevational view partly in vertical section and illustrating a modified arrangement in which a stopper is employed as a closure element for the receptacle instead of the screw cap of the previous figures.

Fig. 8 is a fragmentary perspective view illustrating one end of the retaining band,

Fig. 9 is a fragmentary perspective view illustrating one of the regions of weakness provided circumferentially of the retaining band, and

Figs. 10 and 11 illustrate a method for forming a locking tongue with a weakened root.

Referring to the drawings for describing in

detail the structures illustrated therein, and referring first to the structure Figs. 1 and 2, the reference character L indicates the closure element while the reference character G indicates the retaining element or band.

The receptacle is indicated generally by the reference character H.

The closure element L may be of any type but as here shown is an ordinary sheet metal screw cap having a top wall portion 1 and a pendant annular flange portion 2 threaded to interengage with the threads 3 provided upon the receptacle.

At the lower edge of the flange portion the closure or cap L is formed with an annular outstanding wire edge 4.

A sealing gasket as 5 may be provided within the cap for overlying the upper annular edge of the receptacle if desired.

The closure element or cap L is thus seen to be adaptable for use as a closure for the receptacle independently of whether or not the retaining band G is present, and once the retaining band has been removed said cap may be utilized indefinitely.

The purpose of the retaining band is to initially hold the cap L against unintentional displacement and to indicate by its absence, or by the mutilation or deformation of some part of itself, the fact that the cap L may have been removed. The removal of the band or the deformation of some part thereof will thus serve as notice to the purchaser of the receptacle that the receptacle contents may have been tampered with.

The retaining band G may be formed of a single strip of sheet metal of suitable length to entirely surround the wire edge portion 4 of the cap L, as indicated, plus an overlapping end portion as 6 within which is formed an aperture 7 to receive a tongue 8 provided upon the opposite end portion of the strip.

The upper annular edge portion of the band is turned inwardly so as to provide an inturned annular flange 9 to engage over the upper surface portion of the wire edge 4, and after the band has been properly placed then its lower annular edge portion is turned inwardly to form an inturned annular flange as 10 to engage the under surface portion of an annular rib part 11 provided upon the receptacle.

This general form of retaining band is well known.

In order to prevent possible re-use of this retaining band the present invention proposes that the tongue 8 shall become broken or otherwise incapacitated if attempt be made to bend it a second time, as would be necessary to first release it and then again return it to locking position. To this end it is proposed that the root portion of the tongue, that is the portion where the tongue is joined with the main body of the band, and incidentally the portion where the tongue naturally bends when moved between sealing and unsealing positions, shall be formed with a line of weakness as 12 thereacross so that while this portion is of sufficient strength to withstand a first bend into sealing position, as indicated in the drawings and to provide the requisite resistance to separation of the ends of the band, yet if it be once bent to unsealing position, that is to the position indicated by the dotted lines in Fig. 2, a fracture would occur along the line 12 when effort is made to return the tongue again to sealing position.

The line of weakness 12 may be formed in any manner but is preferably formed by stretching the material, as hereinafter fully explained.

In ordinary use a receptacle having a closure device thereon as above described will be efficiently sealed so long as the retaining band G is not disturbed. If at any time however the tongue 8 be raised to enable removal of the band it will become impossible to again restore the band and the tongue.

In the structure illustrated in Figs. 3 to 6 a means is illustrated by the use of which the band may be positively retained against any rotary movement after it has once been applied onto the receptacle. This is desirable primarily in order to insure that the sealing joint or tongue carrying portion of the band shall be always at the rear side of the receptacle where it will not be objectionably prominent. This means consists in forming the band with inset vertical corrugations or ribs as 13 adapted to mate with vertical corrugations 14 which are provided upon the rib 11 of the receptacle.

Thus when the band is telescoped downwardly over the cap L, in assembling the parts, the ends of the band being at this time connected by the tongue 8, and the lower annular edge portion of the band being straight down as indicated by the dotted lines 15 in Fig. 3, the ribs or corrugations 13 will slide vertically along and in mating engagement with the corrugations 14 and no rotary movement of the band will thereafter be possible.

As most clearly illustrated in Fig. 5 it is proposed that if desired the corrugations 13 may extend sufficiently far down toward the lower annular edge of the band that the lower portions as 16 of said corrugations shall be bent inwardly beneath the lower surface portion of the rib 11 when the flange 10 is bent in beneath said rib, the portions 16 thereby being forced into intimate engagement with the under portions of the corrugations 14 of the receptacle. By reason of the relative edgewise disposition of metal constituting the portions 16 said portions are extremely stiff and, once bent, are capable of holding a set position nesting firmly between and against the under portion of the corrugations 14 of the receptacle, and thus the upper flange 9 of the band is more positively and firmly held down against the upper surface of the wire edge of the cap L.

The mating corrugations 13—14 may continue throughout the circumference of the band and receptacle if desired, but preferably they occur only at restricted localities at opposite sides of the receptacle and hence at opposite sides of the joint formed by the locking tongue 8, as most clearly indicated in the diagrammatic view Fig. 4, since in this way they are made to constitute localized regions of weakness in the band, as indicated generally by the reference characters 17 and 18 in Fig. 4, whereat the band will be likely to bend on vertical axes whenever an effort is made to spread apart the opposite ends of the band.

The upper and lower flange portions 9 and 10 of the band may be provided with notches as 19—19 therein at or adjacent to the regions 17 and 18 so as to more definitely localize the point of bend in the regions 17 and 18 whenever the ends of the band are spread. The notches 19 illustrated are intended only as an example of means to insure such a rupture of the flanges as will constitute a definite indication of tampering, and it will be understood that any other form of weakening means in these localities may be utilized if desired. Bending at the notches will

cause the material to tear or crack outwardly from the bottoms of the notches.

In order to further insure that substantially all bending movement shall occur at the desired localities 17—18, whenever the opposite end portions of the band are spread apart, the portions of said band intermediate said localities may be re-inforced as by horizontal corrugations 20—20 indicated, said corrugations being calculated to prevent any appreciable bending of the material of the band at any point except at the notches 19—19.

In the modification Fig. 7 it is proposed that the retaining band G may if desired be made of sufficient width to engage over the upper end of the receptacle closure element which in this instance is shown to be a cork stopper 21 having a top flange portion 22 with which the band G conveniently engages in the same manner as it engages the wire edge 4 in the previous figures.

Fig. 8 is intended to illustrate that the line of weakness 12 provided across the root of the tongue 8 may if desired be formed simply as a score line 23 instead as a section of stretched metal. It will be noted that in either event however the precise location of the line of weakness is sufficiently outwardly of the surface of the band so that a narrow full strength portion as 24 of the tongue stands to oppose the normal shearing strains imposed against it by the opposing end wall 25 of slot 7 of the band while the band is in retaining position.

The full strength portion 24 projects beyond the outer surface of the band a distance substantially equal to the thickness of the metal of which the band is composed so as thus to offer a suitably strong abutment or shoulder for the wall 25 to engage against.

A closure device constructed as provided herein is simple, practical and efficient. The retaining band serves merely to hold the closure element L against possibility of accidental loosening, but when the ends of the band are separated the band may be entirely detached from the receptacle and disposed of as of no further use leaving the closure or cap L as an attractive and efficient temporary closure for the receptacle.

The method proposed for forming the line of weakness 12 by stretching the metal at the root of the tongue is clearly illustrated in the drawings Figs. 10 and 11. In Fig. 10 the metal to be stretched is indicated at 26 in position between upper and lower dies 27 and 28. Relative vertical movement of the dies toward each other produces the result substantially as shown in Fig. 11. It is to be noted that the distance between the two vertical lines A—B, which coincide with the opposingly positioned vertical surfaces 29 and 30 of the two dies, is less than the thickness of the metal 26. As the two dies move together the corner portion 31 of the die 28 engages the metal 26 and bites therein and stretches and irons out the metal, at the same time causing the metal to bend around the rounded corner surface 32 of the die 27, as clearly indicated in Fig. 11. The shape of the two dies is such that when they are in their full home position, Fig. 11, the rounding surface portion 33 of the die 28 will co-operate with the surface 32 to mould or forge the material 26 at this point into the upstanding shoulder portion 24 hereinabove mentioned.

The portion of the metal 26 between the opposing vertical walls 29 and 30 will of course be of less thickness than the normal thickness of the metal, and it is intended that the portion as 34 of minimum thickness and greatest stretch shall occur just at the upper end of the shoulder portion 24, substantially in the region as indicated between the lines X—Y Fig. 11, in which region the thinned or stretched portion of the metal will bend sharply when the tongue is swung down into sealing position, that is to the position indicated in full lines in Fig. 2.

Below the portion 34 the metal thickens gradually to merge into the main body of metal of the band and above the portion 34 it thickens gradually to merge into the metal forming the tongue.

The portion 34 is thus a hinge portion and due to its thinned and stretched condition is sufficiently fragile so that while it will tolerate the single bending of the tongue to sealing position it will not be likely to tolerate an unbending movement and a return bending.

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

1. In combination, a receptacle and a closure therefor, said closure comprising a cap member and a separately formed retaining band removable to permit removal of the cap, and said band and the receptacle having relative shoulder forming parts interengaging to hold the band against rotary movement upon the receptacle.

2. In combination, a receptacle and a closure therefor, said closure comprising a cap member and a separately formed retaining band removable to permit removal of the cap, and said band and the receptacle having interengaging corrugations transversely of the band co-operative to hold the band against rotary movement upon the receptacle.

3. In combination, a receptacle and a closure therefor, said closure comprising a cap member and a separately formed retaining band removable to permit removal of the cap, said band and the receptacle having interengaging corrugations transversely of the band co-operative to hold the band against rotary movement upon the receptacle, the receptacle having a relatively under-surface portion, and the lower annular edge portion of the band, including the lower end portions of the corrugations of the band, being bent inwardly into engagement with said under-surface portion of the receptacle.

4. In combination, a receptacle and a closure therefor, said closure comprising a cap member and a separately formed retaining band removable to permit removal of the cap, the receptacle having a relatively under-surface portion having shoulder forming projections thereon, the band having transverse corrugations therein and having its lower annular edge portion, including lower end portions of said corrugations, bent inwardly beneath the under-surface portion of the receptacle with the lower end portions of said corrugations nesting between the shoulders of said under-surface portion and being co-operative to hold the band against upward displacement and against rotary movement upon the receptacle.

5. A receptacle closure comprising a cap member and a separately formed retaining band removable to permit removal of the cap, said band

having a circumferentially extending corrugation intermediate its lateral edges and opposite circumferential end portions formed with releasable locking means to hold them connected and said band upon release of said locking means being adapted for removal by a manipulation requiring outward radial swinging of one of said end portions, and said band being formed with a line of weakness thereacross at a distance from said locking means and intermediate its ends constructed to produce thereat fracture of the material of the band incident to the swinging movement of said swingable end portion.

6. A receptacle closure comprising a cap member and a separately formed retaining band removable to permit removal of the cap, said band having a circumferentially extending corrugation intermediate its edges and said band having opposite circumferential end portions formed with releasable locking means to hold them connected and said band upon release of said locking means being adapted for removal by a manipulation requiring outward radial swinging of one of said end portions, said band having top and bottom inturned annular flanges and said flanges having regions of weakness at points intermediate the ends of the band and at a distance from said locking means of a character to define a hinge portion whereat the band will bend when its end portion is swung and said regions of weakness being also of a character to produce thereat fracture of the material of said flanges incident to swinging movement of said swingable end portion.

AUGUSTUS L. MEROLLE.