No. 770,751. PATENTED SEPT. 27, 1904.

D. C. HULL.

CLOSURE FOR BOTTLES, JARS, OR OTHER RECEPTACLES.

APPLICATION FILED NOV. 25, 1903.

NO MODEL.

Fig. 1.

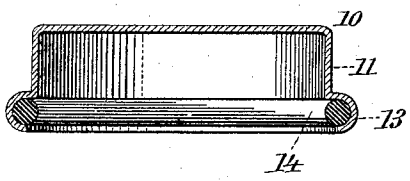


Fig. 3.

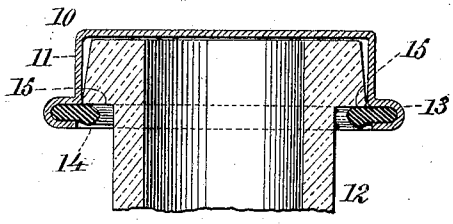


Fig. 2.

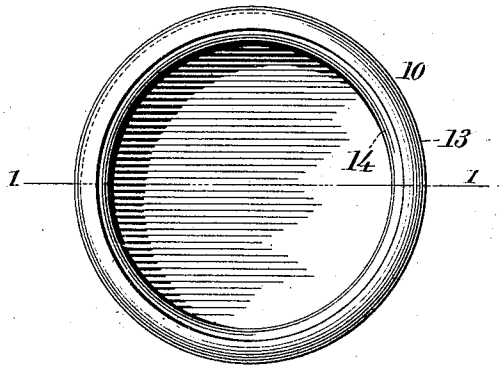


Fig. 4.

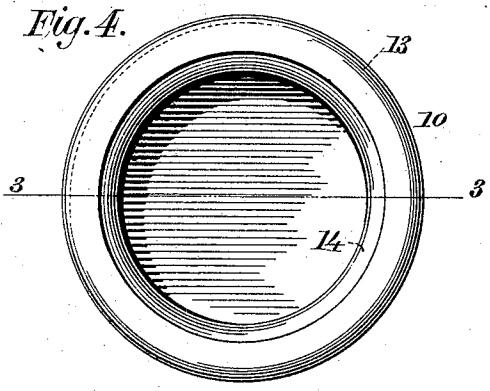


Fig. 5.

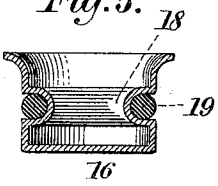


Fig. 7.

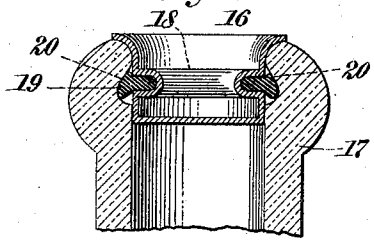


Fig. 6.

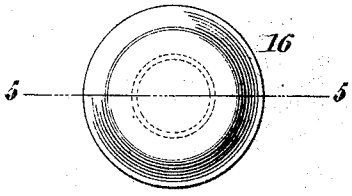
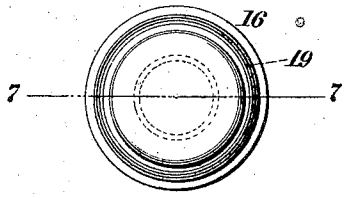


Fig. 8.



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No. 770,751. Patented September 27, 1904.

UNITED STATES PATENT OFFICE.

DOROTHEA C. HULL, OF BROOKLYN, NEW YORK.

CLOSURE FOR BOTTLES, JARS, OR OTHER RECEPTACLES.

SPECIFICATION forming part of Letters Patent No. 770,751, dated September 27, 1904.

Application filed November 25, 1903. Serial No. 182,570. (No model.)

To all whom it may concern:

Be it known that I, DOROTHEA C. HULL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Closures for Bottles, Jars, or other Receptacles, of which the following is a specification.

The invention relates to improvements in closures for bottles, jars, and other receptacles; and it consists in the novel features hereinafter described, and particularly pointed out in the claims.

The invention comprises a novel cap or stopper of sheet metal having in its vertical walls a laterally-projecting annular beading forming within it an annular groove holding a packing-ring which while readily entering the mouth of the bottle or passing downwardly upon the external sides of the bottle-mouth will upon the reduction of the vertical diameter of the said groove have a portion of its body displaced below a shoulder provided upon the bottle-neck, this displacement of a portion of the packing-ring below the said shoulder serving to effect a seal and also to lock the cap or stopper in position.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical section through a bottle-cap constructed in accordance with and embodying the invention. Fig. 2 is a bottom view of same and indicates by the dotted line 1 1 the section on which Fig. 1 is taken. Fig. 3 is a central vertical section through the upper portion of a bottle-neck having applied thereon the bottle-cap of Fig. 1, the lower wall of the groove holding the packing-ring, being shown in Fig. 3 as having been pressed against the packing-ring and as having displaced a peripheral portion of the latter to position below the shoulder on the bottle-neck. Fig. 4 is a bottom view of the cap and packing-ring in the condition in which it is represented in Fig. 3. Fig. 5 is a central vertical section through a plug or stopper, as distinguished from a cap, constructed in accordance with and embodying my invention. Fig. 6 is a bottom view of same and denotes by the bottom line 5 5 the section on which Fig. 5 is taken. Fig. 7 is a central vertical section through the upper portion of a bottle-neck equipped with the stopper represented in Fig. 5, the walls of the groove containing the packing-ring being, in Fig. 7, shown as having been collapsed to displace a portion of the body of the packing-ring below the shoulder formed in the mouth of the bottle, thereby to seal the bottle and lock the stopper in position; and Fig. 8 is a detached bottom view of the stopper shown in the condition in which it is represented in Fig. 7, and in Fig. 8 the dotted line 7 7 denotes the section on which Fig. 7 is taken.

In the drawings, 10 designates a bottle-cap, of aluminium or other suitable sheet metal, having vertical side walls 11, adapted to snugly pass upon the exterior sides of the upper end of the bottle-neck 12, as shown in Fig. 3, and provided with the annular beading 13, whose inner walls form an annular groove receiving and holding an annular packing-ring 14, of rubber or other suitable compressible material, the upper and lower walls of said beading 13 projecting laterally beyond the plane of the sides 11 of the cap in position to be acted upon in a vertical direction for the purpose of compressing the packing-ring 14, and thereby squeezing a portion of the body of the same in a lateral direction below an annular shoulder 15, formed on the neck 12.

It will be seen on reference to Fig. 1 that the inner edges of the packing-ring 14 are practically on a line with the adjacent vertical surfaces of the sides 11, and hence the cap 10 may with ease be placed upon the neck 12, the shoulder 15 of the latter being about on a line with the upper surface of the groove holding the packing-ring 14. After the cap 10 has been placed upon the neck 12 the lower wall of the beading 13 will be pressed upwardly toward the upper wall of said beading and against the packing-ring 14, with the result that the inner peripheral portions of the said ring 14 will be squeezed laterally from the beading and moved below the shoulder 15 on the neck 12, that portion of the ring 14 extending below the said shoulder 15 then serving to seal the

bottle or jar and lock the cap 10 in position. A feature of the construction shown in Fig. 3 is that the packing-ring 14, while sealing the receptacle, permits the reasonably ready removal of the cap 10 when pressure in an upward direction is applied to one edge only of said cap, but that it is substantially impossible to remove the cap 10 by ordinary pressure applied evenly around said cap and in an upward direction.

The closure (illustrated in Figs. 5 to 8, inclusive) is in the form of a stopper or plug 16, adapted to snugly enter the mouth of a bottle-neck 17, and the said stopper is formed in its side walls with the annular beading 18, whose inner surfaces create an annular groove to receive the packing-ring 19, the upper and lower surfaces of said beading 18 being exposed so that pressure may be applied to them for collapsing the beading and squeezing the outer peripheral portions of the packing-ring 19 laterally below a shoulder 20, formed in the bottle-neck, as shown in Fig. 7. The stopper 16 readily enters the mouth of the bottle-neck 17, since the packing-ring 19 is substantially inclosed within the groove formed by the beading 18, and after the stopper has been applied within the bottle-neck the upper and lower walls of the beading 18 will have pressure applied to them for the purpose of causing said walls to approach each other or one of said walls to approach the other and squeezing the outer peripheral portion of the packing-ring 19 laterally below the aforesaid shoulder 20, the outwardly-projecting portion of the ring 19 then serving to seal the bottle and lock the stopper in position.

It will be understood, therefore, that the closure of my invention may be in the form of a cap to be applied over the upper end of the bottle, jar, or other receptacle, or in the form of a plug or stopper to enter the mouth of a bottle, jar, or other receptacle. In either instance the closure will contain the laterally-projecting beading, forming an annular groove holding the packing-ring and having its surfaces exposed beyond the side walls of the closure, so that it may be collapsed vertically against the packing-ring and the peripheral portion of the latter squeezed laterally below a shoulder formed on the neck of the bottle, jar, or other receptacle, and it is to be noted that in both forms of my invention illustrated the cap once placed in position is not disturbed in its relation to the bottle by the vertical collapsing of the beading against the packing-ring, said cap by such operation, when effected in its upper part at all, being drawn more tightly down against the upper walls of the bottle-neck, which is an advantage. There is also a very distinct benefit obtained in my method of utilizing the packing-ring in that the said packing-ring is not reduced in horizontal diameter, nor is it crushed throughout, whereby its elasticity and sealing and locking qualities would be impaired, but is extended horizontally, so that a material portion of said ring leaves the beading, that portion thereof remaining within the beading being pinched tightly, and that portion thereof moved from the beading being a substantial elastic body of considerable horizontal extent and adapted not only to effect a seal, but of passing below a shoulder on the bottle-neck to such degree as to properly lock the closure in position.

It may be seen from an inspection of the drawings that the application of my closure to a bottle tends to shorten the closure and results in the packing-ring being materially increased in its horizontal diameter, so that said ring is caused to extend laterally well beyond the groove provided in the closure to hold it. It has been found in practice that the surface area of the beading on the closure becomes increased upon the closing of said beading against the packing-ring.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a bottle or other receptacle, a closure of the character hereinbefore described therefor, said closure comprising side walls having a laterally-projecting annular beading, and a packing-ring normally adapted to the groove formed within said beading, said beading being reduced in vertical diameter against said ring so that its upper and lower inner walls firmly bind against the upper and lower surfaces of a peripheral portion of said ring and hold squeezed from said groove the other peripheral portion of said ring in firm contact with a portion of said bottle or other receptacle, for sealing the same and locking the closure in position; substantially as set forth.

2. In combination with a bottle or other receptacle having an annular shoulder about its mouth, a closure of the character hereinbefore described therefor, said closure comprising side walls having a laterally-projecting annular beading, and a packing-ring normally adapted to the groove formed within said beading, said beading being reduced in vertical diameter against said ring so that its upper and lower inner walls firmly bind against the upper and lower surfaces of a peripheral portion of said ring and hold squeezed from said groove the other peripheral portion of said ring below and in firm contact with said shoulder, for sealing the same and locking the closure in position; substantially as set forth.

3. In combination with a bottle or other receptacle, a closure of the character hereinbefore described therefor, said closure being in one integral piece of sheet metal and comprising side walls having a laterally-projecting annular beading, and a packing-ring normally adapted to the groove formed within said beading, said beading being reduced in vertical diameter against said ring so that its upper and lower inner walls firmly bind against the up-

per and lower surfaces of a peripheral portion of said ring and hold squeezed from said groove the other peripheral portion of said ring in firm contact with a portion of said bottle or other receptacle, for sealing the same and locking the closure in position; substantially as set forth.

4. In combination with a bottle or other receptacle having an annular exterior shoulder about its mouth, a closure of the character hereinbefore described therefor, said closure being a sheet-metal cap to pass upon the said receptacle and comprising side walls having a laterally-projecting annular beading, and a packing-ring normally adapted to the groove formed within said beading, said beading being reduced in vertical diameter against said ring so that its upper and lower inner walls firmly bind against the upper and lower surfaces of a peripheral portion of said ring and hold squeezed from said groove the other peripheral portion of said ring below and in firm contact with said shoulder, for sealing the same and locking said cap in position; substantially as set forth.

Signed at Brooklyn, in the county of Kings and State of New York, this 23d day of November, A. D. 1903.

DOROTHEA C. HULL.

Witnesses:

J. VARLEY HULL,

ALFRED L. RYER.