C. R. KEERAN.

RECEPTACLE CLOSURE.

APPLICATION FILED APR. 18, 1912.

1,167,306.

Patented Jan. 4, 1916.

Fig. 1.

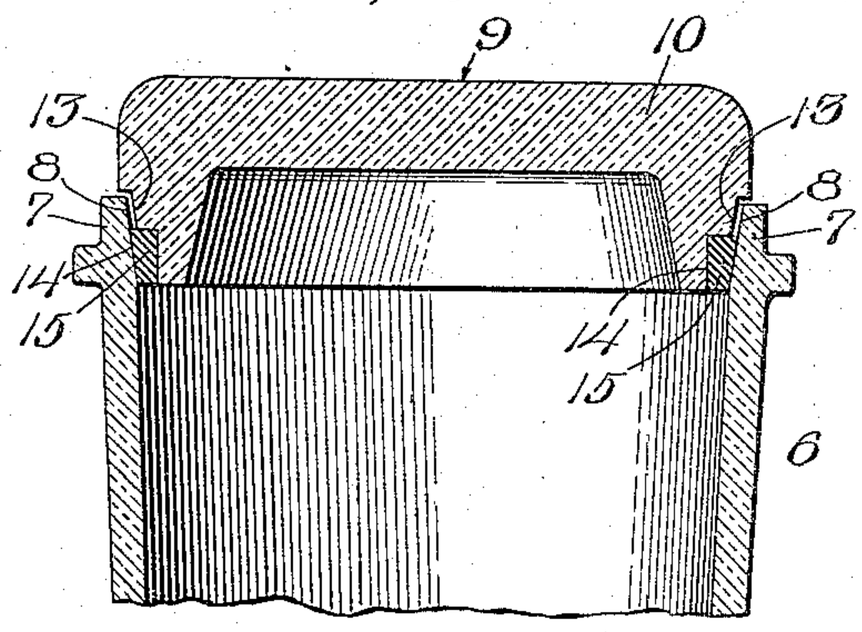


Fig. 2.

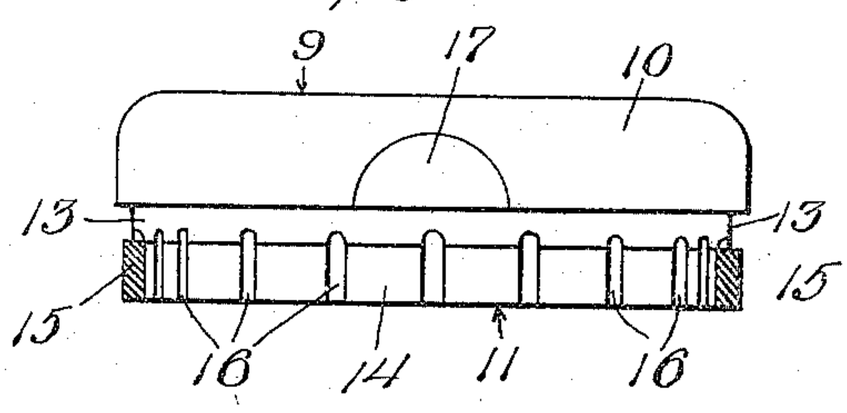


Fig. 3.

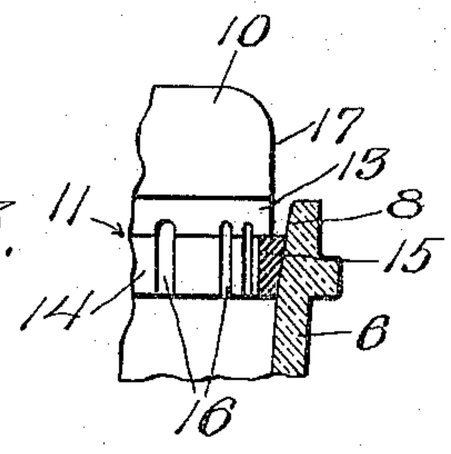


Fig. 4.

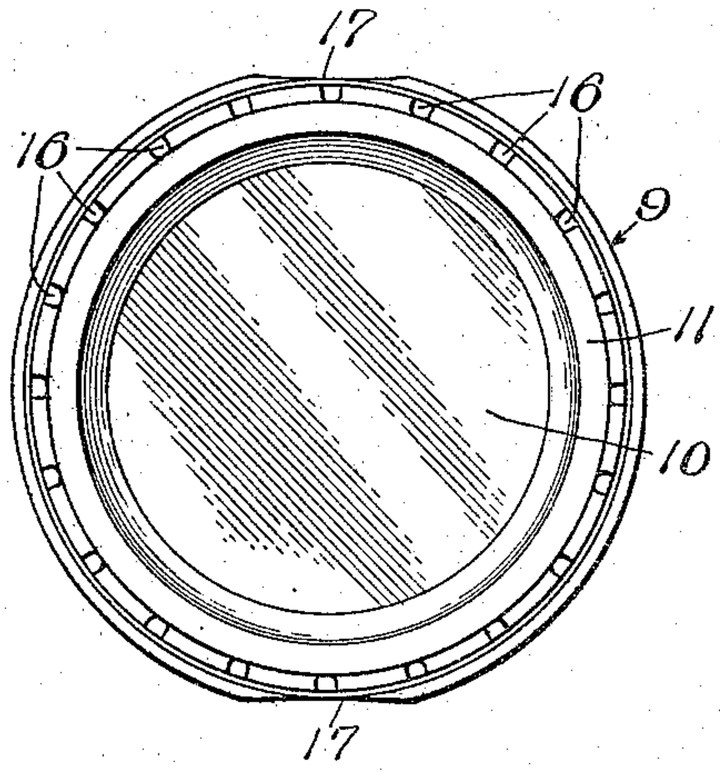


Fig. 5.

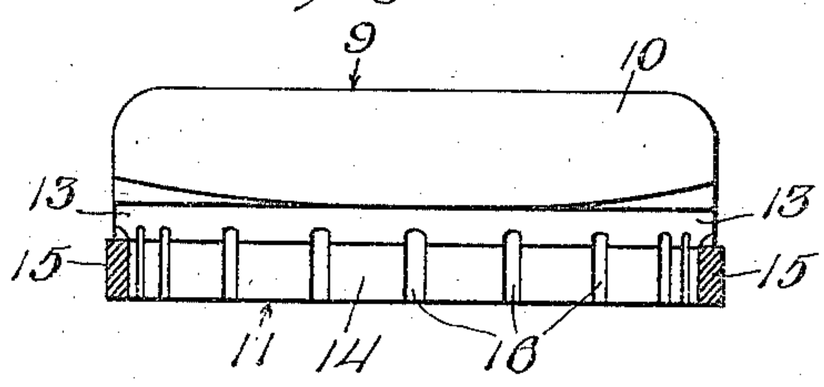
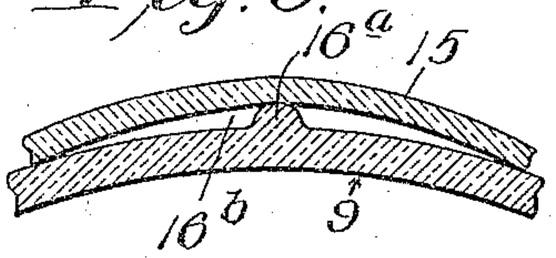


Fig. 6.



Witnesses:
Harry S. Gaither
Wm. P. Bond

Inventor:
Charles R. Keeran
by Banning & Banning.
Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES R. KEERAN, OF BLOOMINGTON, ILLINOIS.

RECEPTACLE-CLOSURE.

1,167,306. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed April 18, 1912. Serial No. 691,562.

To all whom it may concern:

Be it known that I, CHARLES R. KEERAN, a citizen of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Receptacle-Closures, of which the following is a specification.

The present invention relates to a closure more especially adapted for use with receptacles containing food products.

The objects of the present invention are, to provide a closure in which the gasket or sealing substance which forms the seal between the closure and receptacle will be subjected to a wedging action, whereby the cap or closure is held in place under ordinary conditions by friction generated by said wedging action; to so arrange the closure that a movement tending to unseat and withdraw the same will create a certain amount of vacuum within the receptacle before the seal between the outside air and the interior of the receptacle is broken, which vacuum will serve to hold the closure more rigidly in place; to provide an outlet for surplus material or matter which may be forced out of the receptacle by the insertion of the closure in position; to configurate a portion of the closure so as to permit the insertion of the closure-removing tool into operative position; and to provide a closure which is cheap and simple of construction, durable in use, and symmetrical in appearance.

The invention further consists in the features of construction and in the combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a vertical section showing the closure of the present invention in operative position; Fig. 2, a side elevation of said closure, showing the sealing gasket in section; Fig. 3, a detail showing the manner in which the closure is configured to permit of the insertion of a closure-removing tool to break the vacuum; Fig. 4, a bottom view of the closure; Fig. 5, an elevation of the closure showing how it is configured for the purpose of permitting the insertion of a closure-removing tool to pry the closure from position; and Fig. 6, a detail of a modified form of closure.

In the art to which the present invention relates, it is customary to configure certain forms of receptacles, as, for instance, jelly glasses, extract jars, etc., with a mouth which has a slight outward flare to the inner face. In the usual form of closure employed for such receptacles, the closure is configured in correspondence to the flare of the mouth and a tight seal is effected solely by the force with which the closure is held in place. A relatively slight movement, however, will allow of a leakage between the closure and receptacle, which is highly undesirable for obvious reasons. By a peculiar arrangement of the parts of the present invention, a partial vacuum is created when a removal of the closure is attempted, although the seal of the closure is not broken. This vacuum, of course, renders the further movement of the closure more difficult.

Referring now to the drawings, and particularly to Fig. 1, a receptacle 6 is illustrated, having a mouth 7, provided with an inner wall 8 of outwardly flaring formation. The particular form of receptacle shown is, of course, merely for illustrative purposes and is no limitation upon the present invention, other than that said invention is especially adapted for use with a receptacle having a mouth whose inner wall is of outwardly flaring formation. The closure 9, which forms the gist of the present invention, can be made of any suitable material and of any suitable size. The closure shown is in the form of a circular plug-like member having what may be termed an upper portion 10 and a lower portion 11, although the closure may be made of other configurations than the circular one shown, said configuration being in conformity to the configuration of the receptacle with which it is employed.

The upper portion 10 constitutes what may be termed the head of the closure. The lower portion 11 of the receptacle comprises an upper circumferentially extending groove 13 and a lower circumferentially extending groove 14. As will be seen from a study of the drawings, the perpendicular walls of these grooves extend in a substantially vertical plane and are arranged at an angle with respect to the flaring mouth of the closure.

The lower groove 14 is adapted and intended to receive a ring of sealing substance 15, which may be of any suitable material, and in use the shoulder formed by said groove serves to prevent the sealing gasket from spreading upward and hanging out around the mouth of the receptacle, thus maintaining said gasket between the closure and the inner walls of the mouth. The outer surface of this ring will extend in the same

direction as the walls of the groove, and hence will be at an angle to the inner wall of the mouth of the receptacle. By this arrangement, when the closure is forced into place, a firm and efficient wedging of the sealing gasket between the closure and the surface of the receptacle takes place, owing to the divergent angles at which the outer face of the gasket and the inner wall of the mouth are extending. This will be clearly understood by referring to Fig. 1 of the drawings.

For domestic use the ordinary way of forcing the closure into position is by grasping it and by a downward pressing movement forcing it into position. Of course, in preserving and packing establishments, the closure would, in the majority of instances, be forced into position by the use of machinery. The action of the gasket, however, would be the same whatever method might be employed for placing the closure in position. It may sometimes happen that the receptacle to which the closure is applied will be filled with a substance to a point where the insertion of the closure will displace a certain portion of the contents of the receptacle. Obviously, some means must be provided to permit of the escapement of this displaced substance; and the method which I have illustrated for accomplishing this result consists of a series of grooves 16, arranged on the lower portion 11 of the closure, and these grooves extend in a manner, as will be seen from a study of Fig. 2, so that the substance displaced by the insertion of the closure can pass by the gasket and flow to the outside of the receptacle; that is, around the mouth of the receptacle, where it can be easily wiped off.

After the sealing gasket has been subjected to the pressure caused by the insertion of the closure in position, the gasket will run or configure itself so as to fill up the grooves 16, thus effecting a tight joint and rendering the closure air-tight. It is understood that the grooves as illustrated in the drawing are of excess size to those which will be employed in the actual construction of the device.

Taking the closure in the position shown in Fig. 1, and supposing the closure to be moved outwardly, said movement, if it be not too great, will not effect a breaking of the seal of the closure. In order to break the seal, the closure would have to be practically removed from position, so that a slight movement would allow the seal to remain effective, and would not permit the entrance of outside air into the interior of the closure. This is due to the arrangement of the walls of the closure with respect to the walls of the mouth of the receptacle, whereby the firm wedging action heretofore referred to remains effective as to forming a seal even though the closure be partially removed, and the upward movement of the closure tending to displace it will increase the area of the interior of the receptacle. Thus a partial vacuum will be created, and this, as is well known, will tend to hold the closure more firmly in position. By this arrangement, a gradual loosening and removal of the closure will not be possible.

There must be some means employed for breaking the vacuum within the receptacle to permit of a removal of the closure. I have illustrated a method of configuring the closure so as to permit of the insertion of a closure-removing tool. Said method is illustrated in Figs. 2, 3 and 4 of the drawings, and consists of a flat spot 17, which is formed by cutting away a portion of the upper surface of the closure. This flat spot, as will be clearly seen from a study of Fig. 3, permits a knife blade or similar instrument to be forced between the closure and the mouth of the receptacle, whereby an opening will be created to permit outside air to pass into the receptacle, thus breaking the vacuum and permitting the removal of the closure. As illustrated in Fig. 5, a portion of the closure is cut away at the point where it rests against the upper surface of the receptacle. By this arrangement, a knife blade or similar instrument can be forced beneath the shoulder of the closure which rests against the upper rim of the receptacle; and by the leverage thus obtained, the closure can be pried loose after the vacuum has been broken in the manner indicated.

It is understood that in case certain substances are placed within the receptacle which would exert considerable pressure in the interior of the receptacle, a clamping ring or other auxiliary securing means may be employed for holding the closure in place; but for ordinary substances it will be found that a closure constructed in the manner shown and described will be sufficient to accomplish an efficient sealing of the receptacle.

It is understood that changes may be made in the arrangement of the closure without departing from the spirit of the invention, provided, of course, that the structure is maintained within the scope of the appended claim.

In Fig. 6 I have illustrated a modified form of closure, which in the main is similar to the closure heretofore described, but instead of the grooves 16, I provide a series of ribs or projections 16^a, which initially space portions of the surface of the gasket away from the surface of the closure to provide passages 16^b for the escapement of substance.

I claim:

In combination with a receptacle provided with a mouth having an inwardly

tapering inner wall, a closure therefor formed of a single piece and provided with a circumferential groove intermediate its upper and lower ends, the bottom wall of the groove tapering in conformity to the taper of the wall of the mouth, said groove forming a shoulder adapted to overlie the upper edge of the mouth, a second groove extending from the lower terminus of the first groove to the bottom of the base of the closure and adapted to receive a gasket having an outer vertical face, whereby a wedging action is effected between the inner wall of the mouth and the outer face of the gasket, the bottom wall of said second groove extending in a vertical direction, said second groove lying entirely below the upper end of the mouth of the receptacle when the closure is in place and said second groove being of a less depth than the thickness of the gasket, substantially as described.

CHARLES R. KEERAN.

Witnesses:
WM. P. BOND,
MARY R. FROST.