

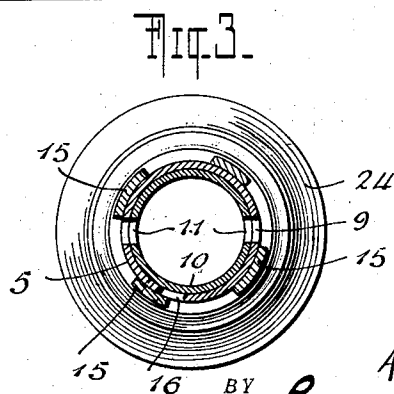
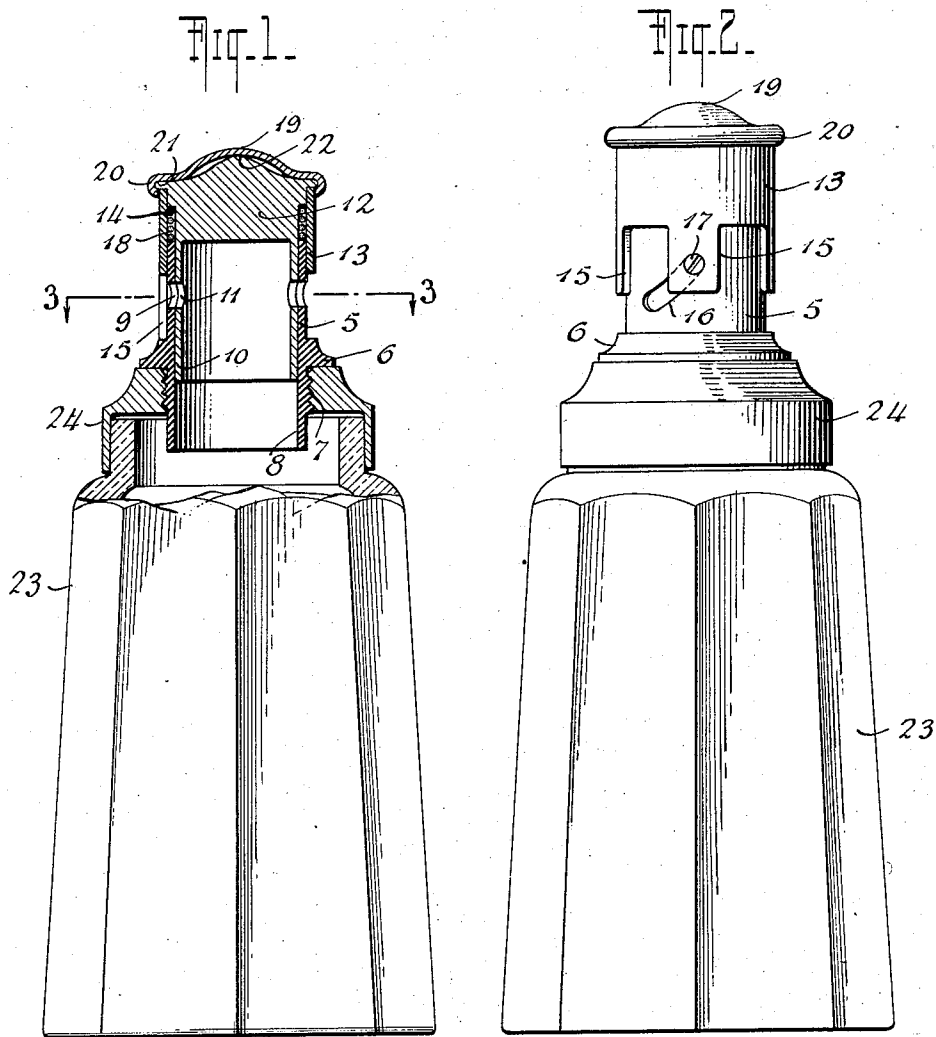
June 3, 1930.

A. HAMMERSTEIN

1,760,946

SELF ACTING CLOSURE FOR RECEPTACLES

Filed Oct. 3, 1928



INVENTOR
ARTHUR HAMMERSTEIN
BY *Lothar Kehlentzsch & Tarkenton*
ATTORNEYS

UNITED STATES PATENT OFFICE

ARTHUR HAMMERSTEIN, OF NEW YORK, N. Y.

SELF-ACTING CLOSURE FOR RECEPTACLES

Application filed October 3, 1928. Serial No. 309,911.

The invention relates to closures for receptacles and more particularly to closures for receptacles designed to contain granular or pulverized solids such as salt, sugar, powder, and the like.

The object of the invention is to provide a closure of simple construction whereby the receptacle is automatically and efficiently sealed against the admission of moisture and to prevent unintentional expulsion of its contents. The invention contemplates further the provision of a closure constructed in a manner to prevent interference with its efficiency of operation because of physical changes in the contents of the receptacle or resulting from the action of said contents on said closure.

Other more specific objects will appear from the description hereinafter and the features of novelty will be pointed out in the appended claims.

In the accompanying drawing, which illustrates an example of the invention without defining its limits, Fig. 1 is a sectional elevation showing a salt cellar equipped with the closure, the parts being in position to permit the contents of the receptacle to be expelled; Fig. 2 is an exterior elevation with the parts in the normal sealing position, and Fig. 3 is a horizontal section on the line 3—3 of Fig. 1.

As shown in the drawing, the closure comprises a tubular member 5 which is preferably cylindrical in form, although this is not essential, as any other suitable cross-sectional shape may be substituted if desired, or found more practical. The tubular member 5 is open at its opposite ends and is provided with an external annular flange 6, and with an axial extension 7 screwthreaded externally for connection with the receptacle for which the closure is designed. The tubular member 5 is further preferably provided with an annular flange 8 comprising an axial continuation of the screwthreaded extension 7 and in any case is constructed to permit the expulsion of the contents of said receptacle at will; the closure accordingly is shown in the drawings as provided in its peripheral wall with one or more exit openings 9, which may be of

any suitable and predetermined form and dimensions suitable to permit the contents to be freely expelled from the receptacle at will. The closure further includes sealing means telescopically mounted upon the tubular member 5 so as to be axially slidable upon the same in surface engagement with both the inner and outer surfaces of said member 5, and adapted to normally close and seal the exit opening 9, both from the inside and from the outside, as shown in Fig. 1; in addition to its telescopic axial movements, the sealing means is constructed and arranged to rotate upon said tubular member 5, coincidentally with its axial movements on the member 5. In the illustrated example, this sealing means comprises a sleeve 10 axially slidable within the tubular member 5 and arranged to normally project inwardly beyond and close the exit opening or openings 9 from the inside. The sleeve 10 is constructed to bring the exit opening or openings 9 or equivalent devices into communication with the interior of the receptacle when it is desired to expel either all or a part of the contents thereof, and in the drawings is accordingly provided with exit apertures 11 similar in form and dimensions and corresponding in number to the exit openings 9; the exit apertures 11 are located and arranged on the sleeve 10 so that in the normal position of the latter, said apertures will be out of registry with the exit openings 9 when the parts are in the position shown in Fig. 2. The cross sectional form of the sleeve 10 corresponds to that of the tubular member 5, and its dimensions are such that it will snugly fit the interior of said member 5 in frictional surface engagement therewith, as shown in Figs. 1 and 3; the inner end of the sleeve 10 is open, while its outer end is closed, and continued for instance in the form of a solid portion 12 as shown in Fig. 1. The sealing means further consists of a hood 13 externally slidable upon the tubular member 5 and arranged to move as a unit with the sleeve 10, said hood 13, in the illustrated example, comprising a separate shell suitably connected with said sleeve 10, for instance, as shown in Fig. 1. The arrangement of the illustrated form of the

closure is such that an annular groove 14 is formed between the hood 13 and sleeve 10, the upper end portion of said groove 14 extending beyond the inner end surface of the solid portion 12 as shown in Fig. 1; the groove 14 is dimensioned to receive the tubular member 5 so as to provide a closed chamber beyond the outer end of said tubular member which chamber has no communication with the interior of said tubular member 10 when the parts are assembled. The hood 13 accordingly fits the external surface of the tubular member 5 in frictional engagement therewith and is dimensioned so that the exit openings 9 will be covered or closed from the outside by said hood 13 when the parts are in the normal position as shown in Fig. 2. The hood 13 is constructed to permit removal of the contents of the receptacle when this is desired, and, as shown in the drawing, is formed with a plurality of recesses 15 corresponding in number to the openings 9 and located so as to uncover the exit openings 9 when the parts occupy the position shown in Fig. 1.

To provide the desired rotation of the sleeve 10 and hood 13 about the tubular member 5, the illustrated example of the invention shows the latter provided with an inclined slot 16 located in diagonal relation to the axis of the closure as shown in Fig. 2. A pin 17 is carried by the hood 13 and extends into the slot 16 so that as the hood 13 and sleeve 10 are axially or telescopically shifted on the member 5, the co-operating action of the pin 17 and slot 16 will rotate the hood 13 and with it the sleeve 10 relatively to the member 5; in the drawings the pin 17 consists of a small screw which passes through the slot 16 into threaded engagement with the sleeve 10, it being understood that any other arrangement whereby equivalent results are obtained may be substituted if desired.

The closure further includes a coil spring 18 located in the chamber *a* of the annular groove 14 having one end in engagement with the outer end of the tubular member 5 and its other end in contact with the outer end wall of the groove 14 as shown in Fig. 1. With this arrangement the coil spring 18 is completely enclosed within the closure and completely isolated or separated from the interior of the sleeve 10 in all positions of the parts, so that at no time is said spring subjected to contact with the contents of the receptacle, and thus is protected against any harmful action which might be developed as a result of such contact.

The spring 18 serves to maintain the combined sleeve 10 and hood 13 in their outward normal positions and to return them thereto so that the closure is self-acting in so far as its closed position is concerned. The outward movement of the combined sleeve 10 and hood 13 under the influence of the spring

18 is arrested by the pin 17 and slot 16 which rotate said sleeve and hood upon the member 5 during the return movements toward their normal position.

To facilitate the depression or axial operation of the hood 13 and sleeve 10 against the tension of the spring 18, and to prevent the relative rotation thereof on the tubular member 5 from developing discomfort to the user or being interfered with by the pressure of the thumb or finger, a cap 19 is mounted upon the sleeve 10 for instance by being crimped at its periphery 20 over a peripheral bead 21 with which said sleeve is provided as shown in Fig. 1. The arrangement is such that the cap 19 is loose with respect to the sleeve 10 and hood 13 and under the pressure developed by the thumb or finger in forcing the sleeve 10 and hood 13 toward the receptacle 23 is held against rotation without interfering with rotation of said sleeve and hood and thus constitutes a non-rotating bearing against which the pressure of the thumb or finger of the user is effective. The rotative movements of the hood 13 and sleeve 10 are thus permitted to take place without interference and without effect upon said thumb or finger. To reduce the possibility of the cap 19 binding upon the portion 12 of the sleeve 10, said portion 12, at its upper end, may be formed with a bearing point 22 engaging the cap 19 at its centre and constituting what may be termed a pivot therefor.

The closure is combined with the receptacle 23 for which it is designed by being screwed into the open end thereof, as shown in Fig. 1. In the preferred arrangement, the receptacle 23 is provided at its open end with an internally, screwthreaded metallic collar 24, suitably secured to the receptacle and arranged to receive the threaded portion 7 of the closure. In the final position of the closure on the receptacle 23, the annular flange 6 rests in surface engagement with the end surface of the metallic ring 24 and thereby produces an absolutely moisture proof connection between the closure and the receptacle 23 at this point. If desired, a suitable packing may be located between the flange 6 and the ring 24 to still further guard against the entrance of moisture into the receptacle 23. The latter may be of any suitable shape or dimensions, best adapted for the purposes for which it is designed and in the illustrated example typifies a conventional salt cellar.

In the normal position of the parts shown in Fig. 2, the exit openings 9 are securely sealed from the inside by the sleeve 10 and from the outside by the hood 13, while the slot 16 is likewise securely closed from the inside by the sleeve 10 and preferably also from the outside by the hood 13. In any case moisture is absolutely prevented from reaching the interior of the receptacle 23 through the exit openings 9 and the slot 16.

When it is desired to remove a part or all of the contents of the receptacle 23, a pressure is exerted upon the cap 19 to telescopically or axially move the hood 13 and sleeve 10 lengthwise of the tubular member 5 against the tension of the spring 18; during such axial operation, the pin 17 will travel lengthwise of the slot 16 and in co-operation therewith will bring about a rotation of the hood 13 and sleeve 10 on the member 5. These movements, both axial and rotative, will continue until the pin 17 reaches the lower end of the slot 16. In this position of the parts, which is illustrated in Fig. 1, the exit apertures 11 are in conterminous registry with the exit openings 9, so that as much of the contents of the receptacle 23 as is desired may be removed by simply inverting the receptacle and either shaking out the contents or simply permitting the latter to flow out through any of the registering openings 9 and 11 by gravity. When the desired amount of the contents of the receptacle 23 has been expelled, pressure is simply removed from the cap 19 to permit the spring 18 to automatically restore the parts to the sealing position shown in Fig. 2. As the hood 13 and sleeve 10 are axially and rotatively moved inward under pressure and outward by the spring 18 when the pressure is removed, they will develop a rubbing contact on the inner and outer surfaces of the member 5 and thereby thoroughly clean the same by scraping any of the contents of the receptacle 23 which may have adhered thereto; any other material which may cling to said surfaces of the member 5 will be similarly removed with the result that the closure is maintained at all times in a condition of maximum efficiency.

The construction of the closure and its combination with the receptacle 23 are such that operation of the device may easily be brought about by grasping the receptacle in the palm and fingers of the hand and using the thumb upon the cap 19 to press the hood 13 and sleeve 10 inwardly against the tension of the spring 18. The parts are thus held in their inner position without effort on the part of the user, and at the same time the receptacle 23 is comfortably held in a position to permit it to be easily inverted and the contents to be easily removed in the desired amount. In other words, the inward pressing of the parts and the removal of the contents are easily accomplished without requiring any special manipulation of the receptacle 23 other than perhaps a shaking movement which may be necessary to bring about the expulsion of the contents. The closure is specially adapted for use with receptacles designed to contain salt, sugar and other pulverized materials likely to become caked by the action of moisture or otherwise effected to interfere with the granular or pulverized form thereof. The closure requires no particular skill in

its operation, and may be readily combined with and removed from the receptacle for which it is designed, and in its preferred form may be disassembled should this for any reason become necessary. The spring 18 or its equivalent is at all times protected against any destructive action which may be developed by the contents of the receptacle 23.

Various changes in the specific forms shown and described may be made within the scope of the claims without departing from the spirit of the invention.

I claim:

1. A closure of the kind described comprising a tubular member adapted to be secured to a receptacle and provided with an exit opening and with an inclined slot in its peripheral wall, a sleeve axially slidable within said tubular member and normally closing said exit opening from the inside, said sleeve being provided with an exit aperture adapted to be brought into registry with said exit opening, a hood movable with said sleeve and normally closing said exit opening from the outside, said hood being externally slidable upon said tubular member and being provided with a recess adapted to uncover said exit opening from the outside, a pin carried by said hood and extending through said slot into communication with said sleeve whereby said hood and sleeve are rotated on said tubular member coincidentally with their axial movements thereon to bring the exit aperture of said sleeve into alignment with the exit opening of said tubular member and to cause said hood to uncover said exit opening, and a coil spring in engagement with said tubular member and located between said sleeve and hood so as to be completely enclosed thereby for normally maintaining the sleeve and hood in an outer position and for returning them thereto, whereby said exit aperture is normally out of registry with said exit opening and the latter is closed by said hood.

2. A closure of the kind described comprising a tubular member adapted to be secured to a receptacle and provided with an exit opening in its peripheral wall, a sleeve axially slidable within said tubular member and normally closing said exit opening from the inside, means for rotating said sleeve about its axis throughout its axial movements, said sleeve being provided with an exit aperture adapted to be brought into registry with said exit opening by an axial and rotative movement of said sleeve on said tubular member, means movable in external surface engagement with said tubular member and normally sealing said exit opening from the outside, said means being movable axially and rotatively with said sleeve and being provided with a recess to free said opening from the outside, and a spring located between said external means and said sleeve in engagement with the tubular member and be-

ing isolated from the interior of the latter for normally maintaining the sleeve and said external means in an outer position and for returning them thereto whereby said exit opening is normally closed both from the inside and outside.

3. A closure of the kind described comprising a tubular member adapted to be secured to a receptacle and provided with an exit opening in its peripheral wall, sealing means axially slidable upon the tubular member in surface engagement with both the inner and outer surfaces thereon and adapted to normally close said exit opening both from the inside and the outside, said sealing means being provided with an interior aperture and an exterior recess adapted to free said exit opening simultaneously from the inside and outside, means whereby said sealing means is rotated about its axis throughout its axial movements, the axial and rotative movements of said sealing means relatively to said tubular member serving to shift said interior aperture and exterior recess into and out of registry with said exit opening and an internal spring located within said sealing means and completely enclosed thereby for normally maintaining said sealing means in position to seal said exit opening and for returning it to said position.

4. A closure of the kind described comprising a tubular member adapted to be secured to a receptacle and provided with an exit opening in its peripheral wall, sealing means axially slidable and coincidentally rotatable upon the tubular member in surface engagement with both the inner and outer surfaces thereof and adapted to normally close said exit opening both from the inside and the outside, said sealing means being provided with interior and exterior apertures adapted to be brought into simultaneous registry with said exit opening to free the same both from the inside and outside, and means located internally of said closure and completely enclosed thereby for normally maintaining said sealing means in position to seal said exit opening and for returning it thereto.

5. A closure of the kind described comprising a tubular member adapted to be secured to a receptacle and provided with an exit opening in its peripheral wall, sealing means provided with an annular internal groove whereby it is telescopically mounted upon said member for normally sealing said exit opening both from the inside and from the outside, said sealing means being provided with interior and exterior apertures adapted to be brought into simultaneous registry with said exit opening to free the same both from the inside and outside, means for rotating said sealing means coincidentally with its telescopic movements on said member whereby said exit opening is opened and closed at will, and a spring in said annular groove bear-

ing against said tubular member and completely separated from the interior thereof, for normally maintaining said sealing means in position to close said exit opening and for returning it to said position.

6. A closure of the kind described comprising a tubular member adapted to be secured to a receptacle and provided with an exit opening in its peripheral wall, sealing means telescopically mounted upon said member for normally sealing said exit opening both from the inside and the outside, said sealing means being provided with interior and exterior apertures adapted to be brought into simultaneous registry with said exit opening to free the same both from the inside and outside, means for rotating said sealing means coincidentally with its telescopic movements on said member whereby said exit opening is opened and closed at will, a spring whereby said sealing means is maintained in and returned to its normal position, and a cap loosely mounted on said sealing means and constituting a non-rotating bearing for the thumb or finger whereby said sealing means is manipulated against the tension of said spring.

In testimony whereof I have hereunto set my hand.

ARTHUR HAMMERSTEIN.