No. 844,400. PATENTED FEB. 19, 1907.

C. RADBRUCH.

BOTTLE STOPPER.

APPLICATION FILED DEC. 9, 1904.

Fig. 1

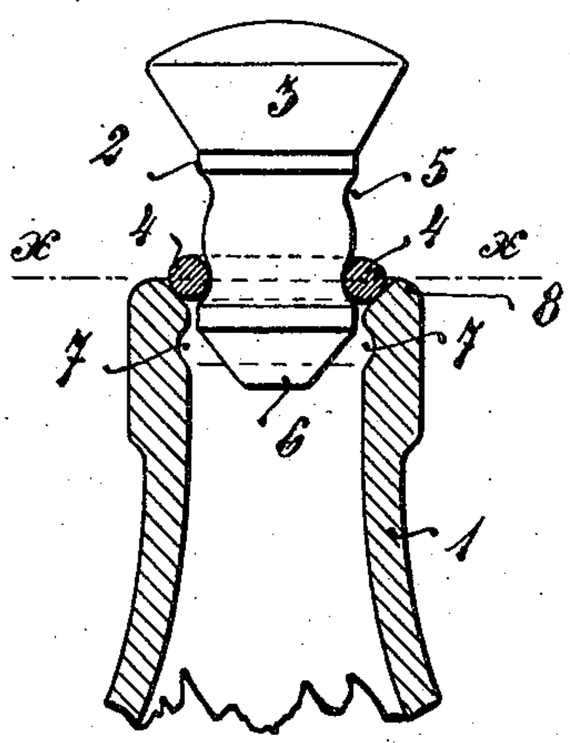


Fig. 2

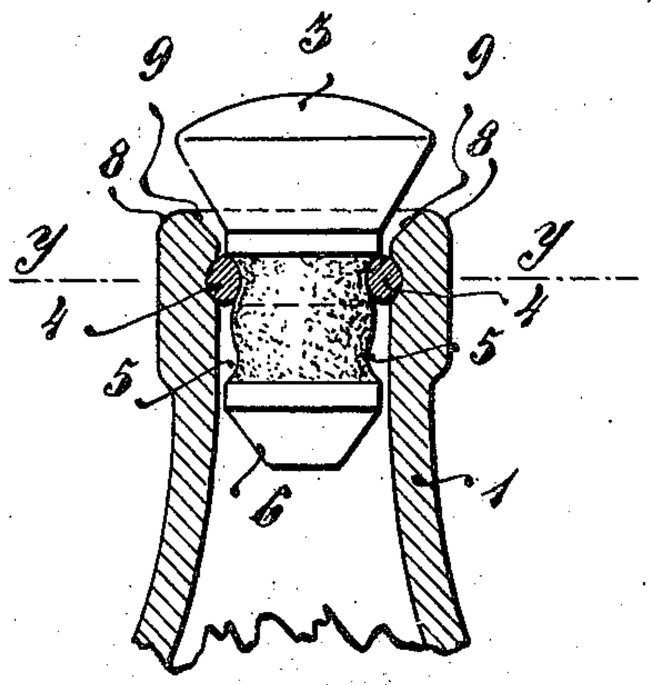
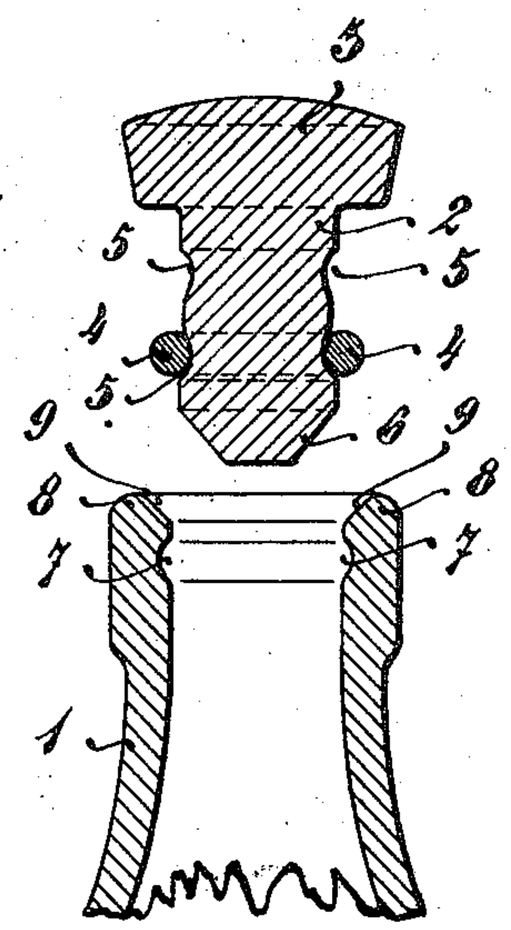


Fig. 3



WITNESSES:

Paul Lange.

Otto Knuth

INVENTOR:

Christian Radbruch

UNITED STATES PATENT OFFICE.

CHRISTIAN RADBRUCH, OF LÜBECK, GERMANY.

BOTTLE-STOPPER.

No. 844,400. Specification of Letters Patent. Patented Feb. 19, 1907.

Application filed December 9, 1904. Serial No. 236,124.

To all whom it may concern:

Be it known that I, CHRISTIAN RADBRUCH, manufacturer, a subject of the German Emperor, and resident of 6ª Karpfenstrasse, in the city of Lübeck, German Empire, have invented certain new and useful Improvements in Bottle Stoppers, of which the following is a specification.

My invention relates to a new closure for bottles, jars, cans, and like receptacles, and consists, essentially, of a stem or like member which more or less loosely enters the mouth of the receptacle and is provided with a gasket or the like which on the stopper being depressed hermetically closes the receptacle.

The gasket consists, preferably, of a rubber ring of round cross-section which embraces the likewise preferably round stem and which on the stopper being depressed gradually turns or rolls over, so that it leaves its normal position at the lower part of the said stem and finally lies around an upper portion of the same.

The central portion of the stem may be thinner than the remainder and so formed as to present an annular groove or depression to receive the ring in its lowest position and a second like groove or depression, separated from the first by a swelling or enlargement, to receive the ring in its uppermost position.

The neck of the receptacle is provided with an internal annular groove or depression in such manner that when the stopper is fully depressed the gasket projects into such depression.

The bottom of the stem is preferably of conical shape, so that the elastic gasket can be the more readily pushed over it. The top of the stem may be provided with a knob, cap, or like head to facilitate its manipulation.

Porcelain, glass, or any other suitable material may be employed in the manufacture of the device.

One advantage of the new stopper is that the mere application of moderate pressure to the device effects thoroughly hermetical closing of the receptacle.

Since the pressure can be exerted in a vertical direction, a large number of receptacles can be closed simultaneously by a long bar or the like being laid over the heads of the stoppers of an assemblage of receptacles and pressure being then applied in any suitable manner.

The stopper is also such that when merely placed upright in the bottle-neck without pressure being applied it will retain such position even when steam, vapors, or the like, caused, for example, by heating the unclosed receptacle, are escaping from the latter and so lifting the stopper more or less from its seat.

Owing to the exceedingly simple construction of the closure the costs of manufactures are very low, the use of metal can be entirely avoided, and cleansing can be effected most expeditiously.

I will now proceed to describe in detail one particular construction of stopper according to my invention; but it must be understood that I in no wise desire to restrict myself to such particular form of closure, as both the shape of the stopper itself and the gasket or like member, as well as the form and location of the depression in the bottle-neck, may be greatly varied without departure from the essential features of the invention. In the case of jars and like wide-mouthed receptacles the stem must naturally be of correspondingly-large diameter, and a rib, bar, or the like may take the place of the cap shown in the drawings.

My invention is shown in the accompanying drawings, in which—

Figure 1 is a vertical section of the neck portion of a bottle, in the mouth of which the new stopper is loosely inserted. Fig. 2 is a like view, the bottle, however, being hermetically closed by the stopper. Fig. 3 is a vertical section, the stopper (of slightly-modified construction) being shown removed from the mouth of the bottle.

1 is the neck of the bottle, into the mouth of which is inserted the stopper, consisting of the stem 2 and head 3. The stem is provided with a thinner central portion 5, round which a gasket is applied, consisting in the present instance of a round rubber ring 4. The bottom 6 of the stem is conically shaped and is preferably of such length that when the round ring 4 is pressed over it it makes one complete revolution and then lies exactly in position at the bottom of the recessed portion 5 of the stem. This recess 5 is preferably formed with a central swelling, so that its ends present annular grooves or de-

pressions, one to receive the ring 4 when in its highest position and the other to receive it when in its lowest position. The central swelling prevents the ring from slipping or working itself from one groove to the other.

The neck of the bottle is provided with a groove 7, corresponding in position to the location of the ring 4 when in its highest position.

To close the bottle, the stopper should be placed in the mouth, as shown in Fig. 1, and then tightly forced down by pressure applied to the head 3. During this procedure the ring 4, owing to the friction between it and the inner wall of the bottle-neck and the stem-neck, will be caused to roll or turn over and leaving its lowest position rise over the swelling and finally lie in its highest position in the upper groove of the part 5, springing or expanding at the same time into the groove 7 in the bottle-neck. The stopper will now have further entered the bottle to the extent of the distance between the horizontal planes X X and Y Y and will effectually close the bottle-mouth.

As Fig. 2 shows, the groove 7 lies nearer to the top 8 of the bottle-neck 1 than the top of the recessed portion 5—that is to say, the plane X X lies nearer to that portion of the head 3 which would sit on the bottle-top were the gasket absent. It is obvious, therefore, that the head 3, even when too violently depressed, can never strike the edge 8 of the neck 1, so that the risk of the head 3 being broken off is wholly avoided.

It is advantageous to chamfer or recess the inside of the edge part 8, so as to present a seat for the ring 4 when the stopper is loosely set in the bottle-mouth, as shown in Fig. 1. In this manner the loose stopper will stand more securely in the bottle-mouth.

The recessed portion 5 may be of such length that the ring 4 in the passage from its lowest to its highest position makes exactly one complete turn. The surface of this recessed portion 5 is slightly rough, as indicated in Fig. 2. For instance, in the case of a porcelain stopper, this part may be left unglazed. This prevents the ring 4 from sliding during the operation of pressing the stopper into the bottle-mouth.

The diameter of the stem 2 or of the conical end portion 6 at the thickest part may be substantially equal to the internal diameter of the bottle-neck, so that when the bottle is closed there is only a very small space between the stem and the wall of the bottle-neck. This is advantageous in certain cases. For example, in the case of sterilized milk it prevents the liquid from coming to any appreciable extent in contact with the material contained in the elastic ring 4, whereby the taste would be affected. In the case of corrosive fluids it prevents the gasket from being essentially attacked.

Having thus described my invention, I claim as new—

1. In combination, a receptacle, the neck of which presents an internal depression, a stopper having a head and a portion which fits into the receptacle-mouth and presents a rough-surfaced annular recess having two annular depressions and a swelling separating the same, and a gasket adapted to lie in the said stopper depressions and rolling from one into the other and into the said depression on the receptacle-mouth on the stopper being depressed, substantially as described.

2. In combination, a receptacle, the neck of which presents an internal depression, a stopper having a head, and a portion which fits into the receptacle-mouth and presents a rough-surfaced annular recess having two annular depressions and a swelling separating the same, and a gasket adapted to lie in the said stopper depressions and rolling from one into the other and into the said depression on the receptacle-mouth on the stopper being depressed, the distance of the top of the recess in the stopper from the stopper-head being greater than the distance of the depression in the receptacle-neck from the edge of the neck, substantially as described.

3. In combination, a receptacle, the neck of which presents an internal depression, a stopper having a head and a portion which fits into the receptacle-mouth and presents a rough-surfaced annular recess having two annular depressions and a swelling separating the same, and which has a chamfered bottom end, and an annular elastic gasket passed over the said chamfered end into the lower annular stopper depression, and rolling into the upper stopper depression on the stopper being pressed into the mouth of the receptacle, substantially as described.

4. In combination, a receptacle, the neck of which presents an annular depression, and the edge of the neck of which is internally flared, a stopper having a head and a portion which fits into the receptacle-mouth and presents a rough-surfaced annular recess having two annular depressions and a swelling separating the same, and a gasket lying in the lower stopper depression and in the flared receptacle-mouth, and on the stopper being depressed rolling into the upper stopper depression and into the depression on the receptacle-mouth, substantially as described.

In witness whereof I have hereunto signed my name, this 11th day of November, 1904, in the presence of two subscribing witnesses.

CHRISTIAN RADBRUCH.

Witnesses:

JUL. WIESE,

JOHS. WULF.