

No. 608,407.

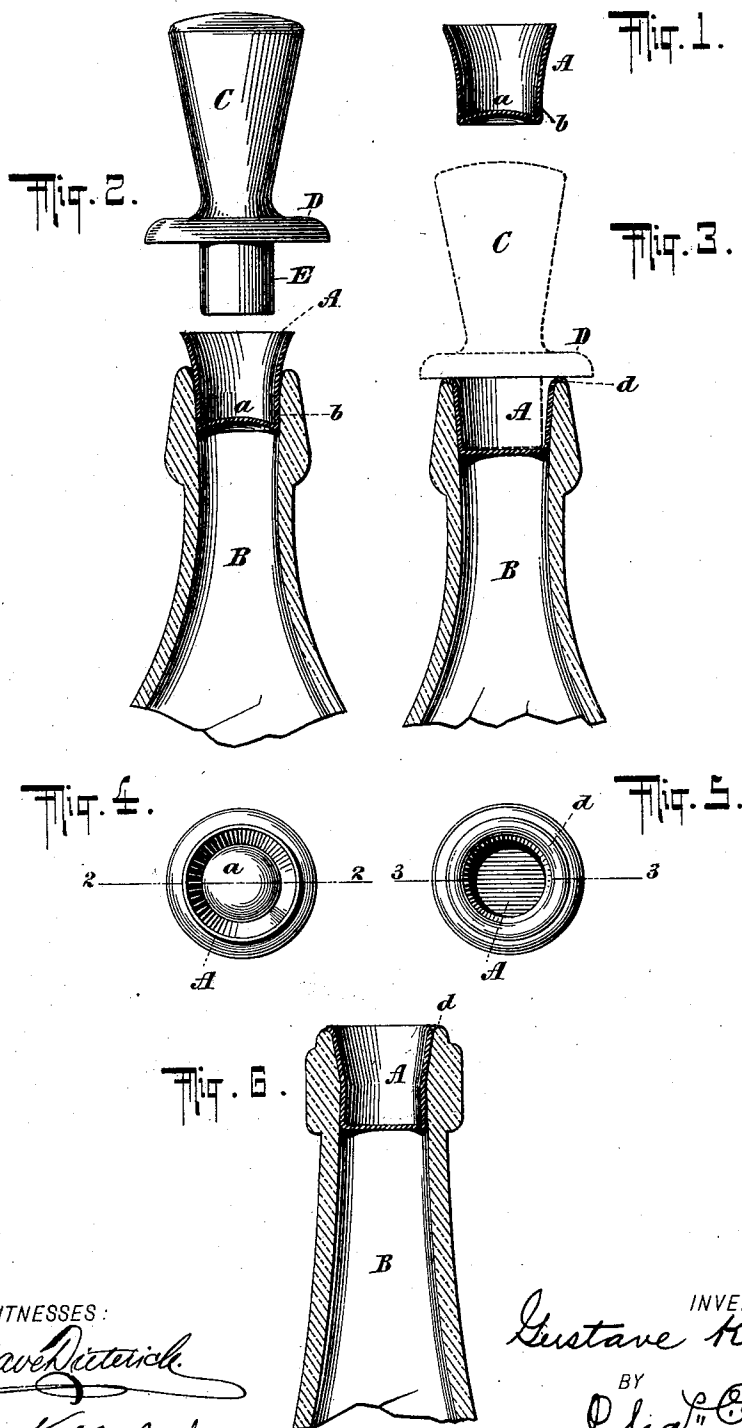
Patented Aug. 2, 1898.

G. KOCH.

STOPPER FOR BOTTLES OR OTHER RECEPTACLES.

(Application filed Jan. 10, 1898.)

(No Model.)



WITNESSES:
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STOPPER FOR BOTTLES OR OTHER RECEPTACLES.

SPECIFICATION forming part of Letters Patent No. 608,407, dated August 2, 1898.

Application filed January 10, 1898. Serial No. 666,161. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE KOCH, a subject of the German Emperor, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Stoppers for Bottles or other Receptacles, of which the following is a specification.

The invention relates to improvements in bottle-stoppers; and it consists in a stopper of the character hereinafter described and claimed, said stopper constituting a substitute for the usual cork stoppers and possessing features of novelty differentiating it from all other known stoppers.

The distinct features of novelty embraced in the stopper will be pointed out hereinafter in connection with the accompanying drawings, in which—

Figure 1 is a central vertical section through a stopper embodying the invention. Fig. 2 is a like view of same shown applied within the mouth of an ordinary bottle, the bottle being in section and the tool for driving the stopper home and effecting the sealing being illustrated in side elevation in position above the stopper. Fig. 3 is a like view of same, the stopper being shown in its sealing position and the tool being indicated by dotted lines. Fig. 4 is a top view of same as presented in Fig. 2 and denotes by the dotted line 2 2 the section on which Fig. 2 is taken. Fig. 5 is a top view of same as presented in Fig. 3 and denotes by the dotted line 3 3 the section on which Fig. 3 is taken, and Fig. 6 is a central vertical section of the stopper shown applied within the neck of a Rhine-wine bottle.

In the drawings I illustrate the preferred form of stopper embracing the various features of my invention, A denoting the stopper, B a bottle to receive and be sealed by it, and C a convenient form of tool by which the stopper may be driven into the bottle-neck with sealing effect.

The stopper A in its preferred form comprises the hollow metallic plug, having its lower end closed by a dish-shaped bottom *a* and provided with sides whose lower portions *b* (about three-sixteenths of an inch in height) are substantially vertical and parallel and whose upper portions, comprising a

comparatively extensive surface area, diverge upward and outward on curved lines to the extreme upper edge of the stopper, the said metallic plug above its lower part having a diameter greater than that of the bottle-neck it is to close and seal.

The various functions accomplished by my invention may be given full effect by a stopper of the character above described, and hence the one form of stopper shown is a full illustration of the several features of the invention, although it is to be understood that this invention is not limited except as indicated in the claims.

One of the main purposes of the invention is to provide a metal plug stopper capable of properly sealing all usual bottles, and thus avoiding any necessity for the special manufacture of bottles possessing peculiar and unusual necks or necks containing grooves, shoulders, screw-threads, or other unusual formations; and a further purpose of the invention is to provide a metal plug stopper capable of effectually sealing the bottle or other receptacle without the aid of rubber, cork, and analogous gaskets.

My invention is based on new principles of construction and operation, and they, with the accomplishment of the purposes above indicated, will be understood from a consideration of the method of using the stopper shown in the drawings.

The stopper A will be placed firmly within the mouth of the bottle or receptacle in the manner shown in Fig. 2, in which it will be observed that the upper outwardly-flaring sides of the stopper are above the upper edges of the mouth of the bottle and are incapable of entering the mouth of the bottle except under definite positive pressure. Fig. 2 illustrates the stopper pushed into the bottle-neck as far as it is possible for the stopper to go under the pressure of the hand. After the stopper has been applied to the bottle in the manner shown in Fig. 2 the tool C will have its lower end inserted within the stopper and its flange D brought upon the upper edges of the stopper, and thereupon pressure will be applied to the upper end of the tool C, the effect of which will be that the flange D on the tool C will act upon the sides of the stop-

per to drive the latter farther downward into the bottle and also to turn over the upper edges of the stopper to form the flange *d*. (Shown in Fig. 3.) The downward pressure of the flange D of the tool C thus, so far as the flange D of said tool is concerned, drives the entire stopper downward into the bottle and also forms the flange *d* on the upper edges of the stopper. The normal height of the stopper is such that the lower reduced end E of the tool C does not operate upon the dish-shaped bottom of the stopper until after the upper edges of the stopper have been turned over by the flange D and the stopper thus shortened sufficiently for the lower extremity of the reduced end E of the tool C to reach and act upon the dish-shaped bottom of the stopper. Thus the first action of the tool C is not to flatten the bottom of the stopper, but to forcibly drive the stopper into the bottle and curl the upper edges of the stopper, and thereupon the pressure or concussive force continuing upon the upper end of the tool C the lower reduced end E of the latter will act upon the dish-shaped bottom of the stopper and serve to move said bottom into a flattened condition, whereby the lower portion of the side walls of the stopper are driven into sealing contact with the inner walls of the neck of the bottle. The stopper when driven into the bottle sufficiently for its outwardly-flaring sides to be crowded into the narrower diameter of the bottle-neck effects along the upper portions of its sides a sealing contact with the walls of the bottle, due to the contraction and compression of said sides and their natural outward flexion against the inner walls of the bottle-neck. The flattening of the bottom of the stopper by the tool C not only carries the outer peripheral edges of said bottom against the bottle-neck, but moves a substantial area of surface of the sides of the stopper against the bottle-neck, and thus the dish-shaped bottom and vertical sides of the stopper combine to produce the sealing effect, and said sides thus moved outward by the flattening of the dish-shaped bottom will fill the somewhat irregular shapes found in the usual bottles and produce a liquid-tight joint without the employment of a gasket and without the employment of shoulders, grooves, and unnatural formations in the neck of the bottle and without the employment of tools acting laterally against the sides of the stopper, all of which previous conditions, remedied by the present invention, are decidedly objectionable.

In its preferred form the stopper A has a compound sealing action, the upper walls of the stopper by contraction and compression coupled with their outward flexion sealing themselves against the upper portions of the bottle-neck and the lower portions of the sides of the stopper by their direct outward pressure closely sealing themselves against the sides of the bottle-neck. The inward contraction and compression of the upper portions of the sides of the stopper also create a

tendency in the lower portions of said sides to move with firmness against the walls of the bottle-neck. The stopper produced in accordance with my invention is thus of substantial height and throughout its height has its extended surfaces in sealing contact with the walls of the bottle. The lower dish-shaped end of the stopper performs functions which have never heretofore been performed by any of the known dish-shaped disks. The dish-shaped bottom of the stopper made the subject of this application moves outward definite portions of the vertical sides of the stopper and effects the sealing contact of said sides with the walls of the bottle-neck, the said bottom after moving the said sides outward operating to restrain said sides from returning to their inward or normal position.

I have demonstrated that the stoppers embodying the present invention are capable of effecting a satisfactory seal without the use of any gasket whatever and without the use of any specially-constructed bottles, the said stopper being adapted for use with the ordinary bottles found in the market.

It is not necessary for me and I do not limit the invention to the non-use of a strip of paper or other binding agent around the sides of the stopper shown, since the stopper shown is in itself novel in construction and operation.

There may be some metals out of which the stoppers might be constructed which would not be sufficiently yielding to effect the sealing of the bottles without the use of a strip of paper or other analogous binding agent around the stopper; but with all metals possessing the ductile character of aluminium, britannia metal, and other soft metals no gasket of any kind is necessary of employment, the metal stopper being of such construction and function as to effectually seal the bottle with the metal in direct contact with the glass.

If the stopper should be used in bottles containing any liquids likely to corrode the stoppers, I should recommend that the surfaces of the stopper be dipped in wax previous to their insertion into the bottles for the protection of said stoppers against the action of the liquids.

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

1. The stopper consisting of the hollow ductile plug closed at its lower end and being intermediate its ends of greater normal or initial cross-section than the neck of the bottle or receptacle to receive it, whereby said stopper requires the application of force for its insertion into said neck, and has its side walls thereby brought into sealing contact with the said neck and made to conform to the usual plain though at times somewhat irregular surfaces of the same, the lower end of said stopper being dish-shaped and so proportioned to said neck that on being flattened it will move the lower portions of the sides of the stopper into intimate binding and sealing contact with said neck and operate

as a fixed wedge to lock the stopper in position; substantially as set forth.

2. The stopper consisting of the hollow ductile plug closed and dish-shaped at its lower end and having the upwardly-diverging sides forming extended vertically continuous sealing-surfaces for direct contact with the walls of the neck of the bottle or receptacle to receive the stopper, the said stopper being above its lower end, of greater normal or initial cross-section than said neck, whereby said stopper requires the application of force for its insertion into said neck and has its side walls thereby contracted and brought into sealing contact with the said neck and made to conform to the usual plain though at times somewhat irregular surfaces of the same, and the said dish-shaped lower end of said stopper being so proportioned to said neck that on being flattened it will move the lower portions of the sides of the stopper into intimate binding and sealing contact with said neck and operate as a fixed wedge to lock the stopper in position; substantially as set forth.

3. In combination with a bottle or receptacle the inner walls of whose neck present the usual plain surfaces, the hollow ductile plug having the sides and a dish end and so proportioned with respect to said neck as to, upon direct insertion, tightly fit said walls and be locked into fixed sealing contact there-

with simply by flattening said dish end; substantially as set forth.

4. In combination with a bottle or receptacle the inner walls of whose neck present the usual plain surfaces, the hollow ductile plug having the upwardly-diverging sides and closed lower end and so proportioned with respect to said neck as to, upon direct insertion, have said sides contracted and conformed to the surfaces of said walls and brought into fixed sealing contact throughout their length therewith; substantially as set forth.

5. As a new article of manufacture, the hollow ductile stopper having the closed lower end and the sides which diverge upward and outward to the extreme upper external edge of the metal, whereby upon the driving of the stopper into the mouth to be sealed by direct force applied to said external edge, the latter may by the one operation of applying the stopper be curved annularly to lap upon the edge of said mouth; substantially as shown and set forth.

Signed at New York, in the county and State of New York, this 8th day of January, 1898.

GUSTAVE KOCH.

Witnesses:

J. H. REILLY,
ALBERT T. OTTO.