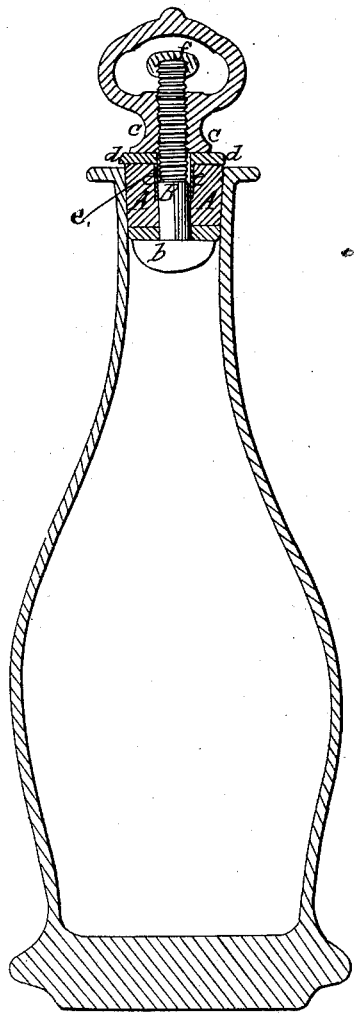
G. R. Willmott,

Bottle Stopper,

No. 49,671. Patented Aug. 29, 1865.



Witnesses:

J. W. Crumb

Geo. Reed,

Inventor:

G. R. Willmott

per Brown Coombs & Co

Atty's.

UNITED STATES PATENT OFFICE.

GEORGE R. WILLMOT, OF MERIDEN, CONNECTICUT.

IMPROVEMENT IN STOPPERS FOR BOTTLES.

Specification forming part of Letters Patent No. **49,671**, dated August 29, 1865.

To all whom it may concern:

Be it known that I, GEORGE R. WILLMOT, of Meriden, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Stoppers for Bottles and other Vessels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, said drawing representing a central vertical section of a bottle with a stopper constructed according to my invention.

This invention relates to elastic stoppers which in their normal condition fit loosely into the mouth of the bottle or vessel, but which after being inserted are expanded circumferentially and made to fit tightly by being compressed in a longitudinal direction.

It consists in an improved construction of such a stopper, whereby it is rendered more firm and durable and more easy of operation.

To enable others to construct a stopper according to my invention, I will proceed to describe it with reference to the drawing.

A is a plug of the form of an inverted frustum of a cone of very slight taper, having a longitudinal opening directly through the center large enough for the free passage of a screw, B, which is inserted directly through it, the said screw having a circular head, *b*, which abuts against and is large enough to nearly cover the bottom of the plug, but not so large but that it passes into the neck of the bottle without touching it. The said screw projects above the top of the plug, where it is fitted with a nut, *c*, of proper form to enable it to be turned easily with the thumb and fingers. Between the nut and the top of the plug there is a loose washer or collar, *d*, which forms a bearing for the nut.

The exterior of the plug is covered with woolen cloth, felt, plush, or flock, to prevent it from sticking in the neck of the bottle. The exterior diameter of the said plug is such that when it is not compressed between the head of the screw and the nut it will pass freely into and out from the neck of the bottle; but that a slight compression between the head of the screw and the collar *d*, produced by screwing down the nut, will cause it to expand circumferentially in a sufficient degree to make it fit tightly to the interior of the neck of the bottle, and to make its central hole contract around the screw B sufficiently to prevent leakage.

The plug A may be made of any elastic substance; but I prefer to make it of elastic vulcanized india-rubber, and to make the upper and lower parts of different degrees of hardness, the lower part being made harder than the upper part, the latter being soft enough to expand under a comparatively light pressure of the nut, and the former being sufficiently hard to prevent the head of the screw from indenting itself deeper into it than is desirable. By this means the plug is rendered more durable.

I prefer to cover the exterior of the said plug with flock, which may be applied to the surface of the rubber before subjecting it to the heat required for vulcanization, or may be applied after vulcanization by the aid of a solution of india-rubber or any suitable adhesive varnish or cement.

The washer or collar *d* has made in the same piece with or otherwise firmly attached to it, a tube, *e*, which forms a lining to that part of the interior of the central hole in the plug A which receives the thread of the screw, and thereby prevents the abrasion of the hole by the thread.

The attachment of the tube to the collar or washer makes the stopper firmer than when the tube is detached.

On the upper end of the screw there is applied a stop, *f*, to prevent the nut from being unscrewed higher than is necessary to relieve the plug A from compression, and to allow it to contract circumferentially in a sufficient degree to loosen it in the neck of the bottle. This stop may consist of a cap or nut screwed tightly onto the end of the screw, as represented, or of a collar riveted onto the end of the screw.

The nut *c*, collar or washer *d*, and tube *e* may be made of metal, hard vulcanized india-rubber, or other suitable material.

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

1. Attaching the tube *e* to, or forming it in

the same piece with, the collar or washer *d*, substantially as and for the purpose herein specified.

2. The stop *f*, applied in combination with the screw B and nut *c* of the stopper, substantially as and for the purpose herein specified.

3. Making the upper and lower parts of the elastic plug A of the stopper of two different degrees of hardness, substantially as and for the purpose herein specified.

4. Coating the exterior of the plug with flock, substantially as and for the purpose herein specified.

GEO. R. WILLMOT.

Witnesses:

JOHN S. GREENFIELD,

J. H. BRECKENRIDGE.