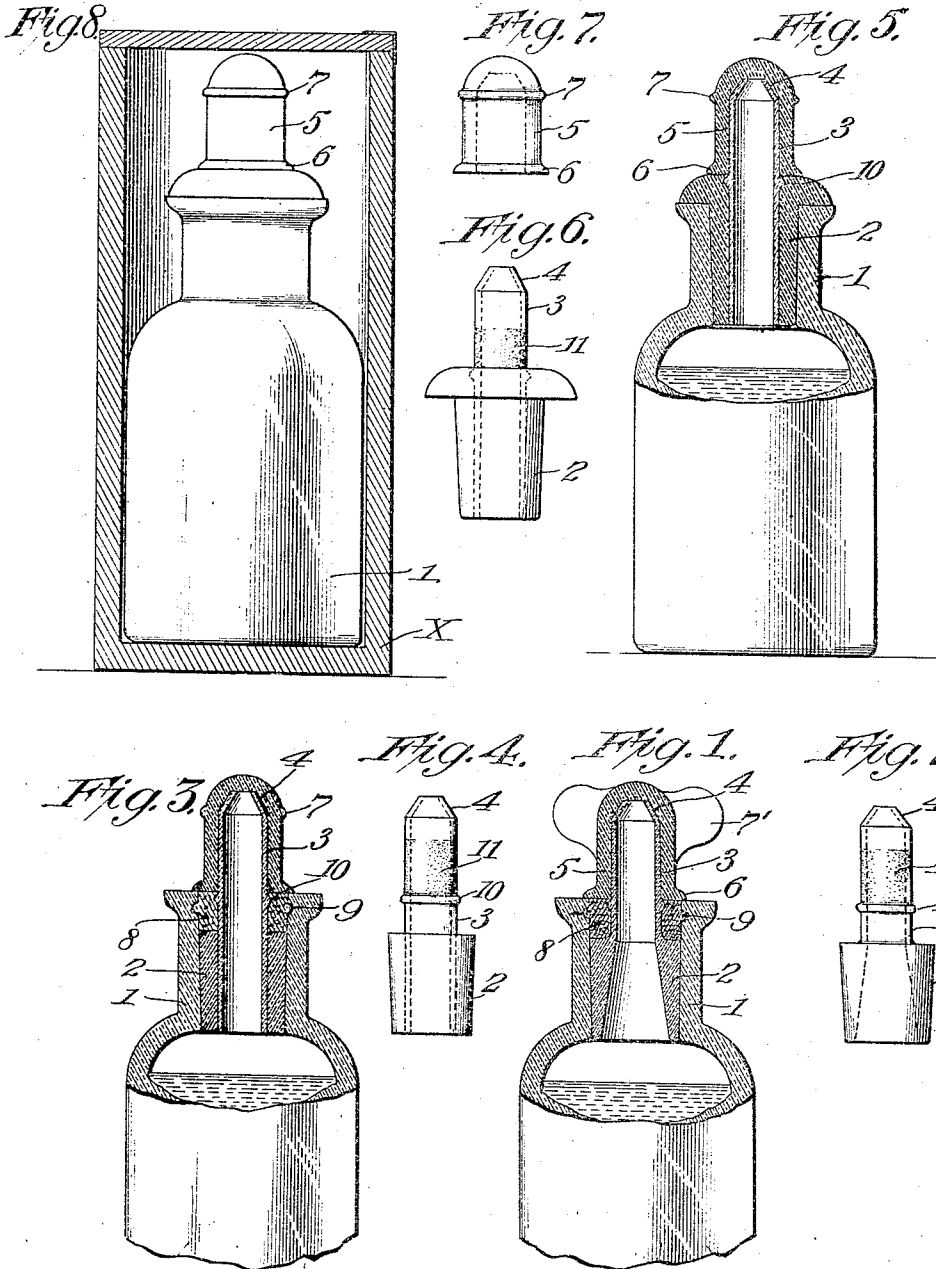


J. E. CONNOLLY.
BOTTLE STOPPER.
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BOTTLE-STOPPER.

1,287,237.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES E. CONNOLLY, a citizen of the United States, residing in the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Bottle-Stoppers, of which the following is a specification.

This invention relates to improvements in bottle stoppers and has for its object to provide a stopper especially adaptable for bottles containing medicines and dental supplies, particularly materials as synthetic porcelain used for dental fillings, and phosphoric acid used by dentists. It is of the utmost importance that such materials be kept free from all discoloration, and it is the object of this invention to provide a stopper which shall prevent discoloring matter from collecting around the discharge opening of the stopper, as it does around the lip of the ordinary standard bottle heretofore used for such materials, and which will furthermore protect the contents of the bottle from the fumes of strong drugs.

A further object of the invention is to provide a stopper of this character which shall facilitate the removal of the bottle from the snug recess in the box in which the bottle is kept when not in use. Heretofore bottles for this purpose have been provided with heavy glass stoppers, and it was almost impossible for the dentist to remove the bottle from the box without the use of a metal instrument, both by reason of the fact that no room was provided whereby the fingers could grasp the stopper and because the stopper pulled out of the bottle leaving the bottle in the recess.

A further object of the invention is to provide a device of this character which shall also facilitate in the dispensing of the material from the bottle, whereby small quantities of material may be quickly and easily removed, which may not be readily done with the bottles now in use. It also prevents the careless or unthoughtful dentist from inserting his instrument into the bottle to collect a small quantity of the contents thereon, as he may do in using the ordinary bottle in which it is so difficult to remove small portions of material in any other way. My invention furthermore prevents the returning of material to the bottle, thereby preventing the remainder of the contents being discolored or contaminated.

These objects of my invention are attained

by the provision of an air-tight stopper in the neck of the bottle, the stopper being provided with a projecting tubular portion having a converging discharge end. A flexible cap is provided to tightly fit over the tube portion.

In the accompanying drawings all of which are on an enlarged scale, Figure 1 shows in section a bottle stopper embodying the preferred form of my invention.

Fig. 2 shows the stopper in elevation removed from the bottle.

Fig. 3 is a modification of the construction shown in Fig. 1.

Fig. 4 is an elevation of the stopper shown in Fig. 3 removed from the bottle.

Fig. 5 shows another modification of the stopper applied to the bottle.

Fig. 6 shows an elevation of the stopper shown in Fig. 5.

Fig. 7 is an elevation of the cap of the stopper as adapted to be used with any construction.

Fig. 8 represents on an enlarged scale a section of the usual box provided with a cylindrical chamber in which is inserted a standard bottle provided with my improvement.

Referring more particularly to the drawings, 1 represents a standard bottle for dental materials very much enlarged. 2 is a stopper or plug within the neck of the bottle which is provided with a tube portion projecting beyond the top of the bottle. This tube may be formed integral with the stopper, in which case both are preferably formed of glass or hard rubber, as shown in Fig. 1 and the opening through the plug may be conical, being wider at its inner end. The main portion of the tube above the top of the bottle has its walls parallel, but the outer discharging end has its walls converging very abruptly to form a cone tapering toward the end of the tube, and forming a discharge opening of less diameter than that of the tube. It will be noticed that I prefer to keep the walls of the cone flat, as shown at 4 rather than to curve them as is ordinarily done in stoppers of this general nature. By this construction powder is more easily dispensed without clogging, and liquids will run out without shaking the bottle, the opening being comparatively large.

A cap 5 of rubber or similar flexible material is provided to fit tightly over that portion of the tube projecting beyond the

neck of the bottle. This cap 5 is provided with a bead 6 at its base adapted to fit tightly against the top of the stopper. It may also be provided with a bead 7, as shown in Fig. 8, or ears 7' as shown in Fig. 1, whereby it may be readily grasped. I may also etch or otherwise roughen the outer walls of the tube 3, as indicated at 11, whereby the cap adheres more firmly to the tube. From the foregoing it will be obvious that to remove the bottle from the recessed box in which it is contained, the cap 5 need only be grasped and slight pressure applied thereto to cause it to more firmly grip the tube and the bottle can readily be lifted out of the box.

The plug portion of the stopper 2 may be of a variety of constructions, all of which are preferably of glass or rubber, it being important to keep away all metal from the contents. In Figs. 1 and 2, as heretofore described, the tube 3 and stopper 2 are integral. The stopper is made of less height than the depth of the neck of the bottle into which it fits so that it may be sealed with sealing wax 8 or other suitable material. An annular recess 9 in the neck of the bottle 1 and an annular bead 10 on the tube 3 serve to more securely anchor the sealing material.

In Figs. 3 and 4 the stopper is of rubber and separate from the tube portion 3 which is of glass and which passes therethrough. It is however sealed in a similar manner as at 8 with a suitable plastic material. In Figs. 5 and 6 the stopper is of greater height than the neck of the bottle, and is provided with a flange adapted to fit snugly over the lip of the bottle. In this construction the bead 10 on the tube 3 is recessed in the rubber, so that the bead or flange 7 of the cap 5 may set snugly against the top of the stopper 2.

In Fig. 8 I have represented an enlarged view of a bottle provided with any one of my improvements inserted in a circular recessed chamber as ordinarily constructed in the standard box, X, in which it is customary to pack and keep the bottles, and this figure shows clearly the space around the cap between the cap and the walls of the box whereby room is provided for the fingers of the person desiring to remove the bottle to readily grasp the cap.

From the foregoing the advantages of my device over constructions heretofore used for this purpose will be readily apparent.

It will be observed that the plug 2 extends to the extreme lower end of the neck of the bottle and terminates there, thus avoiding the lodgment of material in the neck of the bottle below the plug. It will also be observed that the tube 3, in Figs. 3 and 5, extends to the extreme lower end of the

plug where it terminates and that the inner surface of the tapered outer end of the tube gradually decreases in diameter and extends to the extreme outer end of said tube. In this way while the contents of the bottle may pass freely through the tube the amount delivered by the tube is properly restricted and the insertion of an instrument is made difficult. Furthermore, by the construction shown the orifice or delivery end of the tube is at the extreme outer end of the tapered portion and not removed therefrom in such way as to produce a delivery channel of any material length.

The flange 10 on the tube not only serves to anchor the latter to the plug or to the sealing material but it limits the inward movement of the cap 5. This cap, as before stated, is made of elastic material and is made to slide on the outer end of the tube 3 so that it may be quickly removed from the tube by a sliding motion without the necessity of being turned as would be the case if the tube were threaded which would require considerably more time when removing the cap. The cap so fits the bottle that the bottle may be lifted bodily out of its case without danger of dropping away from the cap, but when the bottle is held in the hands of the operator the cap can be easily removed from the tube by the fingers of the same hand that holds the bottle. Furthermore, it will be observed that the cap fits tightly over the extreme outer end of the tube so that there is no danger of the contents of the bottle spilling into the cap and when the cap is being withdrawn a suction takes place which relieves air pressure in the tube and permits the contents of the bottle to flow out rapidly. When the cap is applied it is forced downward on the tube until its inward movement is arrested by the flange or bead 10, at which time the outer end of the cap fits closely against the mouth of the tube but the flange prevents the edge of the tube from digging into the body of the cap.

When the tube 3 is applied to a plug 2 of the kind shown in Fig. 5 the flange 10 limits the inward movement of the tube and further this flange prevents the tube from being either forced inward in the plug or drawn outward therefrom when the cap is being placed upon the tube or withdrawn therefrom.

It will thus be seen that I have provided a closure for bottles which is designed to prevent the waste of material and to enable a dentist and others to open and close a bottle with one hand while the other hand is engaged in other work.

What I claim as my invention is—

1. The combination with a bottle of a plug within the bottle neck and extending to and terminating at the extreme inner end

of the neck, a tubular delivery member carried by the plug extending beyond the top of the neck and having a tapered outer end the inner surface of which gradually decreases in diameter and extends to the extreme outer end of said member, and a cap closely fitting the outer portion of said delivery member and the outer end of which rests against the extreme outer edge thereof.

2. The combination with a bottle of a plug of elastic material within the bottle neck and extending to and terminating at the extreme inner end thereof, a tubular delivery member extending through the plug, terminating at the extreme inner end thereof and projecting beyond the top of the neck, means for preventing endwise movement of the tube in the plug, and a cap of elastic material having a sliding engagement with said delivery member and the interior of which closely fits the extreme outer end thereof.

3. The combination with a bottle of a hollow plug for the bottle neck extending into and terminating at the inner end of the neck, a delivery member for the bottle supported by the plug extending above the top of the neck and having an annular bead intermediate its upper and lower ends, and a cap for the delivery member made of elastic material which closely fits the outer portion of said member, has a sliding engagement

therewith and which rests against said bead when the cap is applied.

4. The combination with a bottle of a hollow plug within the bottle neck, a tubular delivery member for the bottle supported by the plug extending above the top of the neck and having an annular bead intermediate its upper and lower ends, and a cap for the tube made of elastic material the upper end of which fits closely the upper end of the delivery member and the lower end of which rests against said bead when the cap is applied, said cap having a sliding engagement with the delivery member when being applied or withdrawn.

5. In combination with a bottle having a neck, a stopper inserted in said neck below the top of the bottle, said stopper having an opening therethrough and being provided with an outwardly projecting tube, plastic sealing material in the top portion of the neck above the stopper and level with the top of the bottle, and a cap having a recess the height of the projecting tube over which it is adapted to fit, said cap being adapted to fit evenly against the surface of the sealing material.

In testimony whereof, I have hereunto subscribed my name.

JAMES E. CONNOLLY.

Witness:

WILLIAM E. SCHUL.