

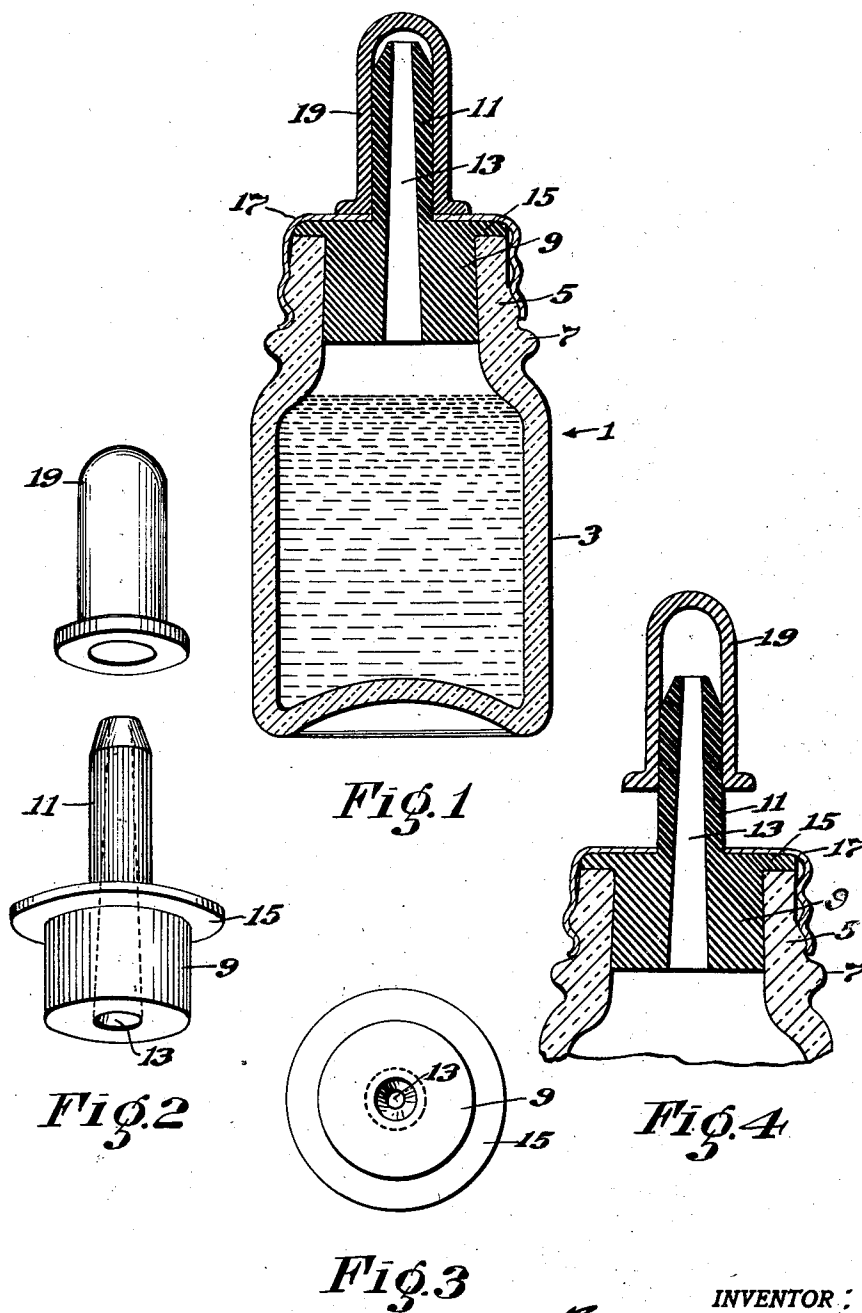
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BOTTLE

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## UNITED STATES PATENT OFFICE

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## BOTTLE

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The invention to be hereinafter described relates to bottles for dispensing materials, such, for example, as cement and a phosphoric acid preparation used by dentists.

Heretofore for this purpose, a bottle has been provided having a dispensing stopper comprising a plug having a hole extending therethrough, and a glass tube fitted into the hole and projecting from the plug, said tube being provided with a removable cap. When it is desired to remove some of the contents of the bottle, the cap is removed from the tube, and the bottle is shaken to discharge liquid from the bottle drop-by-drop. In shaking the liquid onto a glass slab, there is danger that the glass tube will strike the slab, and be driven into the stopper or be broken. Also, it is difficult to obtain glass tubes of uniform outside diameter, and if they are slightly under size, they are liable to escape from the rubber plug, and even if the tubes are of the correct size, they are liable to escape from the plug, due to the extreme lubricating quality of the phosphoric acid preparation. A further objection is that after some of the liquid has been shaken from the bottle, there is liable to be a little residual liquid at the end of the glass tube which will work its way down along the outer surface of the tube and oil the same so that the rubber cap will not be properly secured to the tube.

The purpose of the present invention is to provide a dispensing stopper which will overcome the aforesaid objections.

The character of the invention may be best understood by reference to the following description of one good form thereof shown in the accompanying drawings, wherein:

Fig. 1 is a vertical section through the bottle and stopper;

Fig. 2 is a perspective view of the stopper and its cap, the latter being removed;

Fig. 3 is a view looking toward the bottom of the stopper; and

Fig. 4 is a vertical section through the bottle neck and stopper showing the stretching of the cap when applied to the neck.

Referring to the drawing, 1 designates a bottle preferably made of glass and compris-

ing a body 3 having a wide neck 5 externally threaded above a circumferential bead 7, the opening in the neck being slightly tapered internally so that the diameter of the opening is progressively less from the base to the outer end thereof.

The dispensing stopper, in the present instance of the invention, comprises a plug 9 made of high grade elastic rubber. Projecting from and preferably formed integral with the plug is a rubber tube 11 vulcanized to a degree sufficient to give it a fair amount of stiffness and yet permit slight flexion thereof. In making the plug and tube, the stiffening of the latter is accomplished by subjecting it to the process of vulcanization the proper length of time. The tube is cured for a certain length of time, and then raw stock is added to the mold to form the plug, and is cured for a number of minutes less than the time required to cure the tube. The plug and tube have a tapered dispensing passage 13 extending therethrough. Projecting outward from and formed integral with the plug is a flange 15 overlying the outer end of the bottle neck. A cover 17 preferably made of painted metal, is threaded to the neck and has a flat top adapted to seat against the outer end of the plug, and has a hole receiving the tube 11.

A thimble-shaped cap 19 preferably made of elastic rubber, is provided for the tube. Preferably the internal diameter of the cap is somewhat less than the external diameter of the tube, so that when the cap is slid onto the tube, it will be stretched or expanded somewhat, as will be observed in Fig. 4, thereby to cause the cap to cling closely to the tube. The tube is somewhat shorter than the cap, so that the flanged end of the cap may seat closely against the top of the cover. Further to secure the plug in the neck, its flange 15 may be cemented to the end of the neck, and the top of the cover may be cemented to the upper surface of the plug.

There are important advantages in the bottle stopper of the present invention. The rubber tube is integral with the elastic plug, and therefore, there is no liability of its sepa-

- ration therefrom. The tube is vulcanized to give it sufficient stiffness to stand up when the thimble-shaped cap is slid thereon. There is no danger that the cap will escape from the tube as both are made of rubber, and the cap is stretched onto the tube and tends to cling tightly thereto. If the end of the tube strikes a slab or other hard surface when shaking liquid from the bottle, it will not be broken or dislocated or be pushed into the plug. Since the neck of the bottle has a tapered opening, when the rubber plug is pressed therein it will be compressed somewhat and its inherent resilience will cause it to expand into intimate engagement with the neck, and escape of the plug from the neck will be resisted. Cementing the top of the cover to the plug will prevent any residual liquid on the outer surface of the tube from seeping in between the cover top and the plug. The metal cover is an added precaution against escape of the plug from the neck, and it is desirable that it shall be painted internally to prevent acid from attacking the metal. This stopper has been found by practical experiment to meet the requirements of its use. It is strong and simple in construction, and cheap to manufacture.
- It will be understood that the invention is not limited to the specific embodiment shown, and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.
- What is claimed is:—
1. The combination of a bottle and a dispensing stopper therefor comprising an elastic rubber plug fitting into the neck of the bottle, and a vulcanized slightly flexible rubber tube of substantial stiffness projecting from and integral with the plug, said tube being selfsustaining and of materially greater stiffness than the elastic rubber plug, said plug and tube having a passage extending therethrough.
  2. The combination of a bottle and a dispensing stopper therefor, comprising an elastic rubber plug fitting into the neck of the bottle, a vulcanized, fairly stiff rubber tube projecting from and integral with the plug, said plug and tube having a dispensing passage extending therethrough, said plug having a flange overlying and cemented to the outer end of the bottle neck, a cover threaded to the bottle neck overlying the plug and having a hole receiving the neck and a thimble-shaped cap for the neck having a flange adapted to engage the cover.
  3. The combination of a bottle and a dispensing stopper therefor comprising an elastic rubber plug adapted to fit into the neck of the bottle, a fairly stiff rubber tube projecting from and integral with the plug, said plug and tube having a dispensing passage extending therethrough, said plug having a flange overlying and cemented to the outer end of the bottle neck, a metal cover threaded to the neck and having its upper surface cemented to the plug, and a removable cap for the tube.
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