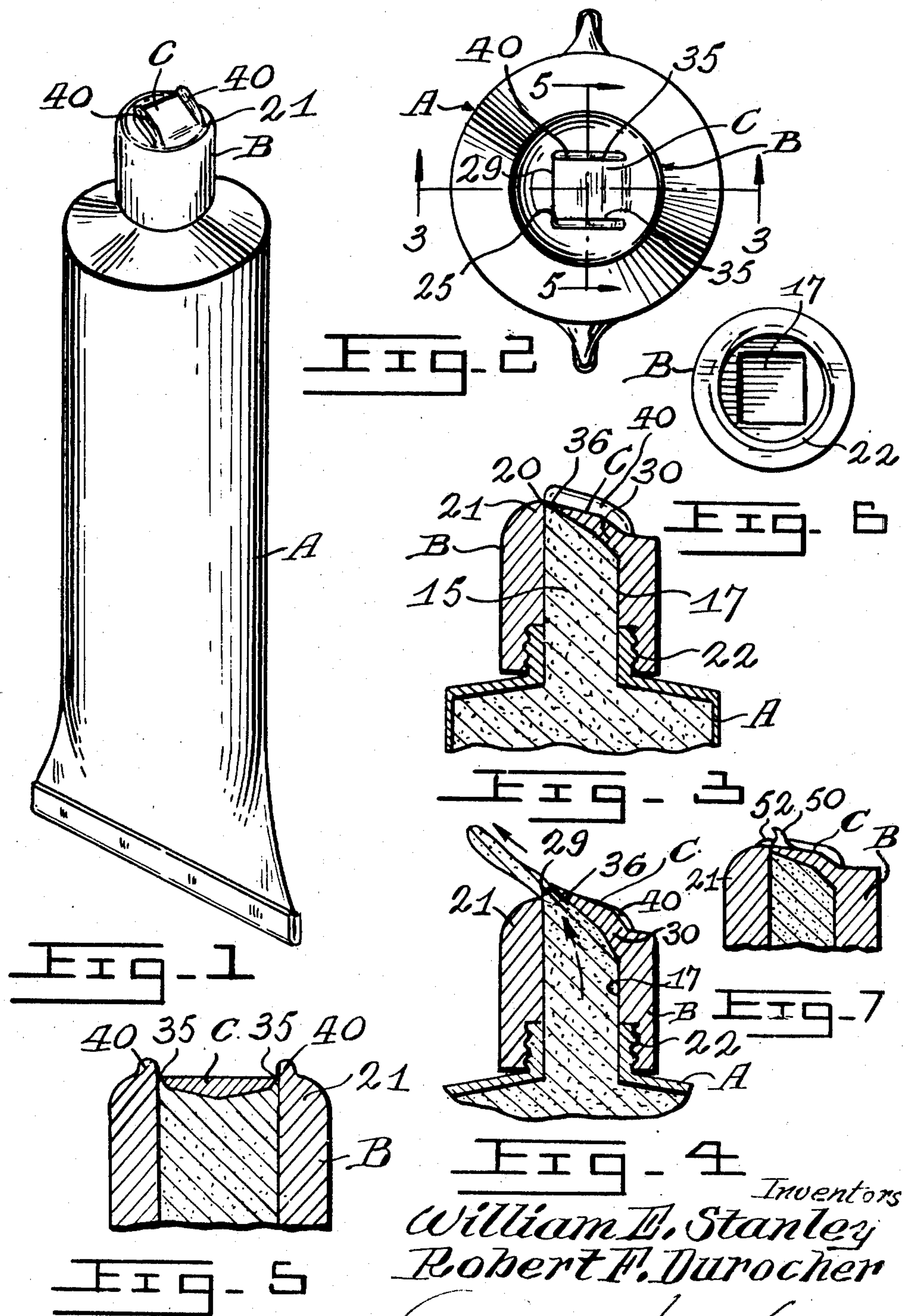


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SELF-SEALING CLOSURE MEMBER

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## UNITED STATES PATENT OFFICE

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## SELF-SEALING CLOSURE MEMBER

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6 Claims. (Cl. 222-490)

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*Introduction*

This invention relates to closure members for container-dispensers for viscous fluid materials, and more particularly to those of the type including a self-sealing stopper.

There have been many attempts to provide commercially practical articles of this nature. Their great shortcoming has usually been that the device has been too complicated or has not worked properly, or both.

*Applicants' development*

The applicants have now developed a closure member for container-dispensers which is simple, effective in operation and convenient to manufacture from readily available materials. This member comprises a cap for attachment to the container-dispenser, the cap including a bore, and a head disposed across the bore and including a dispensing mouth. In accordance with the invention the mouth is formed by side and front slots in the head defining an integral elongated tongue and complementary groove. The tongue has side edges and a tip, and said groove has side walls and a leading wall abutting the side and leading edges respectively. The tongue is connected to the head by an unslotted base portion extending between the side walls at the base of the tongue. The tongue is preferably tapered from the base towards the tip. The tongue is articulated to the head by the flexibility of the material from which the cap is made so that it is adapted to be raised by the material forced from the container under pressure and to return to closed position against this material by its own resiliency on release of the pressure.

The preferred material from which the cap is made is polyethylene. A member of this material has the capacity of being flexed out of shape and of resiling relatively slowly as compared, for example, with rubber, which snaps back into shape relatively fast. Preferably raised portions of the head border the side slots thereby to provide a continuation of the walls of the groove so as to restrict lateral escape of the material being dispensed when the tongue is raised above the normal level of the head.

Preferably, the tongue and groove are substantially rectangular in outline. Preferably, the bore includes a neck portion which is substantially rectangular in outline, and the walls of the groove form a continuation of the bore.

*Detailed description*

Having thus generally described the nature of

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the invention, particular reference will be made to the accompanying drawings, illustrating preferred embodiments, and in which:

Figure 1 is a front view in perspective elevation of a flexible container capped by a closure member constructed according to the invention.

Figure 2 is a top plan view of Figure 1.

Figure 3 is a sectional view of Figure 2 along the line 3-3 illustrating the closure member with the flap or tongue closed.

Figure 4 is a sectional view of Figure 2 corresponding to Figure 3 illustrating the closure member with the flap or tongue open.

Figure 5 is a sectional view of Figure 2 along the line 5-5.

Figure 6 is a bottom plan view of the closure member removed from the container to illustrate the formation of the internal bore.

Figure 7 is a detailed cross sectional view showing a modification in the form of a tongue.

Referring more particularly to the drawings, A is a flexible container, for example, a tooth paste tube, and B is a closure member constructed according to the invention. In the preferred form shown, this closure member is moulded or cast from plastic material. The member B includes a bore 15 having a narrow or neck portion 17 leading to a mouth or outlet 20 formed in the head 21 of the cap. The inner end of the bore 15 is tapped as at 22 for connection with the container A. The neck of the container is screw threaded as indicated.

In accordance with the invention, the mouth 20 is formed by side slots 25 and an end slot 29 through the head portion. These slots preferably form a continuation of the walls of the narrow portion of the bore 17 and define a tongue C which is integral with the head and connected to it by a base portion 30 extending between the base of the side slots 25. The tongue thus has side edges 35 and a tip 36, and preferably tapers in thickness from the base 30 to the tip 36 so as to provide greater flexibility adjacent to the tip.

The head portion 21 of the closure member B is preferably provided with raised ridges 40 bordering the slots 25. The ridges 40 preferably have inside faces forming a continuation of the side walls of the groove 25. This arrangement provides confining walls between which the end portion 36 of the tongue C is adapted to flex so as to allow material squeezed from the tube to escape only from the outlet 20 adjacent the tongue tip 36.

The cap B is preferably formed of polyethylene



which has properties which are particularly suitable for the present invention. The relatively thin member C of polyethylene has the capacity of being bent under pressure and then resiling relatively slowly to its original form. This contrasts with the property of rubber which snaps back relatively fast after being pulled out of shape.

#### Operation

In operation the tube A is filled with viscous fluid material, for example, tooth paste, paint, or any other substance normally dispensed from flexible lead or plastic containers. Normally the tongue C is retained in the closed position shown in Figure 3. The resilience of the material from which the cap is made is effective to keep the material in the tube until substantial pressure is exerted on the side walls of the tube. The tongue C can be held down by tape or in any other suitable way before the tube is first put into use.

For example, the cap could be dipped in collodion or other cellulosic material so as to provide a frangible seal. The tap or other seal is sufficiently strong to prevent escape of any material from the tube under pressure which may be encountered during packing or handling in shipping, and also capable of withstanding extreme pressures as would be likely to burst the tube.

Figure 7 illustrates a modification. The tongue C is provided with a lug 50 and the head 21 with a catch portion 52. These parts are preferably molded integrally with the tongue and cap respectively.

The purpose of the cap is to retain the tongue in closed position despite pressure from the tube contents. The tongue can only be pulled past the cap by the use of the lug 50.

The preferred material for the cap has been described as polyethylene, because of the unusual properties of this material, particularly its type of resiliency. It is also resistant to both acid and alkaline materials. This is a great advantage and widens its field of use. For some purposes, however, the cap can be made of other materials, for example rubber, and synthetic rubbers like polychloroprene. The particular material from which it is best made will depend on the proposed contents of the tube and the exact properties required in the cap.

#### We claim:

1. A closure member for a container dispenser for viscous fluid materials comprising, a cap including a bore, a head disposed across the bore,

the head having side and front slots defining an integral elongated tongue and complementary groove, said tongue having side edges and a tip, and said groove having side walls and a leading wall abutting said side and leading edges respectively, said tongue being connected to the head by an unslotted base portion extending between the side slots at the base of the tongue, the tongue being articulated to the head by the flexibility of its material and adapted to be raised by the material forced from the container under pressure and to return to closed position against said material by its own resiliency on release of said pressure, and raised portions of said head bordering the side slots thereby to provide a continuation of the walls of the groove thereby to restrict lateral escape of material when the tongue is raised above the normal level of the head.

2. A closure member according to claim 1, wherein the tongue and groove are substantially rectangular in outline.

3. A closure member according to claim 1, wherein the bore and slots are co-extensive whereby the walls of the groove form a continuation of the bore.

4. A closure member according to claim 1, wherein the closure member is made of polyethylene.

5. A closure member according to claim 1, wherein the tongue and groove are substantially rectangular in outline and the bore and slots are co-extensive whereby the walls of the groove form a continuation of those of the bore.

6. A closure member for a container dispenser for viscous fluid materials comprising, a cap including a bore, a head disposed across the bore, the head having side and front slots defining an integral elongated tongue and complementary groove, said tongue having side edges and a tip, and said groove having side walls and a leading wall abutting said side and leading edges respectively, said tongue being connected to the head by an unslotted base portion extending between the side slots at the base of the tongue, the tongue being articulated to the head by the flexibility of its material and adapted to be raised by the material forced from the container under pressure and to return to closed position against said material by its own resiliency on release of said pressure.

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