Jan. 19, 1960 H. MARCEL 2,921,708

STOPPERS

Filed Nov. 23, 1953 2 Sheets-Sheet 1

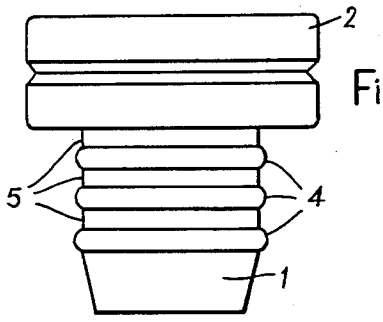


Fig 4

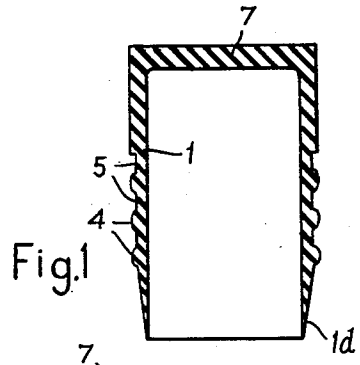


Fig.1

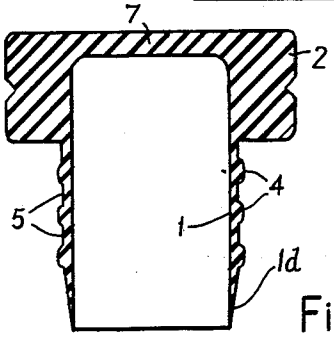


Fig.2

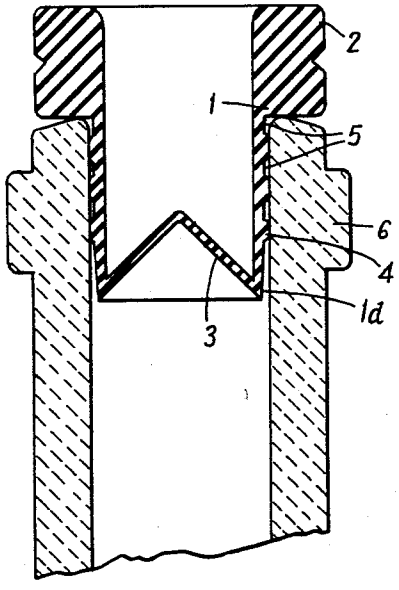


Fig.5

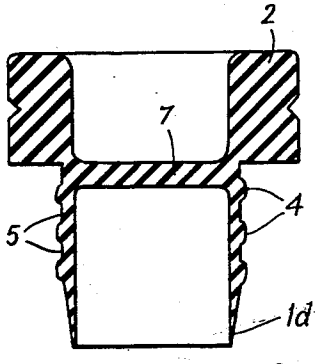


Fig.3

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Jan. 19, 1960 H. MARCEL 2,921,708

STOPPERS

Filed Nov. 23, 1953 2 Sheets-Sheet 2

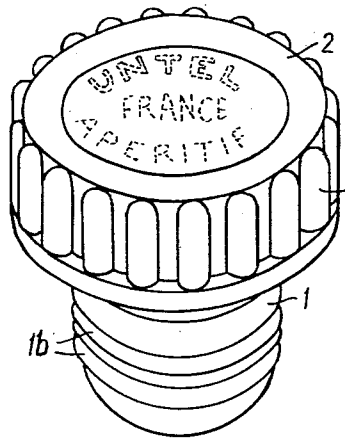


Fig.6

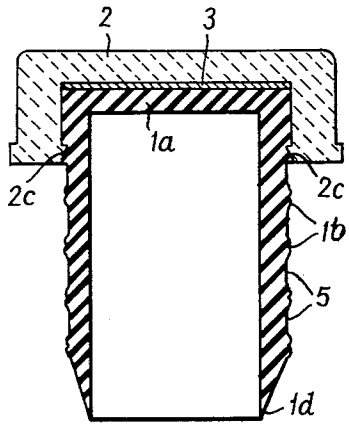


Fig.7

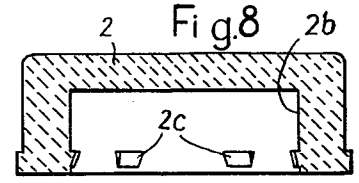


Fig.8



Fig.9

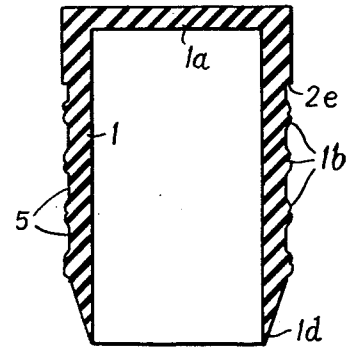


Fig.10

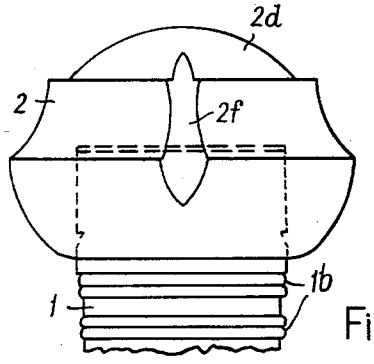


Fig.11

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STOPPERS

Henri Marcel, Lyon, France

Application November 23, 1953, Serial No. 393,875

Claims priority, application France November 24, 1952

3 Claims. (Cl. 215—48)

This invention relates to stoppers for bottles and similar containers, and more especially to such stoppers made of resilient and elastic synthetic plastic materials, particularly polyethylene.

It has been suggested to close bottles and the like with stoppers made of such plastic materials which are hollow and have relatively thin elastic walls. These stoppers have the disadvantage that their diameter must correspond exactly to the diameter of the neck of the bottle; if they are forced into too small a neck, they tend to form longitudinal creases which prevent an air-tight seal. Further they do not withstand a large pressure inside the bottle and tend to be forced out by the internal pressure, e.g. as produced by carbon dioxide.

The stoppers of this invention avoid these disadvantages, affording a much tighter and stronger seal and allowing a larger tolerance with respect to the diameters of the stopper and the bottle-neck. They offer further advantages as will be pointed out as this specification proceeds.

In its simplest form the stopper of the invention consists of a hollow cylindrical body of polyethylene, said body having a thin wall and being closed at the top and tapering towards the other end, the outer surface of the body having a plurality of circular ribs moulded therearound which have been found to prevent creasing in the thin wall of the stopper. Preferably the stopper is further provided with a head which may or may not be integral with the body of the stopper. In the latter case special means may be provided to fix easily but firmly the head to the body of the stopper, and by making the head of transparent material a thin sheet or foil of material bearing inscriptions, pictures or the like may be inserted between the head and the upper part of the body of the stopper. Instead of closing the hollow cylindrical body at the top, the closing element may be provided at the opposite tapering bottom end of the body.

Moreover, these circular ribs eliminate capillary creep of liquids and provide an effective seal against increase of vapour pressure.

In order to make the invention more readily understood, some embodiments of same are described in connection with the attached drawings, by way of example only.

Fig. I shows a cross-section of a stopper without a head.

Fig. II shows a cross-section of a stopper with an integral head.

Fig. III shows a cross-section of another stopper with an integral head.

Fig. IV shows a side-view of another stopper with an integral head.

Fig. V shows a cross-section of the stopper of Fig. IV.

Fig. VI shows a diagrammatic view of a stopper with a separate attached head.

Fig. VII shows a cross-section of the stopper of Fig. VI.

Fig. VIII shows a cross-section of the head of a stopper according to Fig. VII.

Fig. IX shows a piece of sheet material to be inserted between the head and the body of a stopper according to Fig. VI.

Fig. X shows a cross-section of a body of a stopper according to Fig. VI.

Fig. XI shows a diagrammatic view of a similar stopper as used primarily for bottling sparkling wine.

The stopper shown in Fig. I consists of a hollow cylindrical body **1** moulded of polyethylene having circular ribs **4** separated by grooves **5**. This cylinder is closed at the upper end **7** and tapers towards the lower end as shown at **1***d*.

The stopper shown in Fig. II differs from that of Fig. I in that the upper part **7** of Fig. I protrudes over the rim of the bottle-neck thus forming a head **2** integral with the body.

The stopper shown in Fig. III differs from that of Fig. II in the form of the head.

The stopper shown in Figs. IV and V shows the cylindrical hollow body **1** with the ribs **4** and the grooves **5** and the head **2**. Contrary to the formerly-shown stoppers the stopper is closed by a cone-shaped part **3** at the lower tapering end **1***d*.

The angle of this cone may be, for instance, about 90°. By inserting this stopper into the neck **6** of a bottle, the cone **3** is compressed lengthwise, the top rising up and the angle decreasing, thereby pressing the tapering end of the body towards the bottle-neck.

The stopper shown in Figs. VI–X consists of the cylindrical hollow body **1** of polyethylene with ribs **1***b* and grooves **5** and the tapering end **1***d*, and a separate head **2** which is serrated or fluted as shown at **2***a* for affording a firm grip. In the body above the ribs, grooves or cavities **2***e* are provided for receiving projections **2***c* provided on the internal surface **2***b* of the head **2** as shown in Fig. VIII. These projections are saw-tooth shaped having a steeply bevelled lower surface and a horizontal upper surface. Due to the elasticity of the body **1**, the projections **2***c* will engage, if pressed down, the cavities **2***e* but will strongly resist separation of the head from the body if pulled upwards. The head may be made in all cases of any rigid material suitable for the purpose. But it is preferable to use a transparent material in which case a thin sheet **9** (Fig. IX) inserted before connecting the head **2** to the body **1** by means of the projections **2***c* and the cavities **2***e* will be held firmly between these two parts and will be visible from above. This sheet, which may be of any desired material, may be printed or decorated as desired and will be protected by the transparent head. Instead of using a separate sheet, the upper closing part **1***a* of the body may be printed or decorated.

The stopper can also, as shown in Fig. XI, be composed of a body and a head which consists of several parts, namely a part **2** of rigid material, and a dome-shaped part **2***d* of soft elastic material which, combined, form a stopper as used for bottling sparkling wine, etc. **2***f* are grooves for locating the usual retaining wires for champagne stoppers.

The above described stopper in all its forms is readily applied to bottles, jars, and other containers by ordinary mechanical means.

What I claim, is:

1. A stopper for fitting into the neck of a bottle or jar, comprising a hollow cylindrical body moulded of polyethylene, said body having a thin cylindrical wall and the outer surface of the cylindrical wall having a plurality of circular reinforcing ribs moulded thereabout which prevent longitudinal creases occurring in

the thin wall of the body when the stopper is inserted into the neck of a bottle or jar, integral end wall closing the upper end of said cylindrical body, a head member separate from the body and made of a rigid transparent material with a cylindrical cavity on its underside adapted to receive the upper end of the body, means securing the head to the body, and a sheet of material secured between the end wall of the body and the head and visible through the overlying transparent portion of the head.

2. A stopper comprising a hollow cylindrical body composed of an elastic resilient synthetic plastic material and closed at its upper end, a head composed of transparent material formed separately from the body and adapted to fit over the closed end thereof, and means for securing the head and body together inseparably, a sheet of material interposed between the head and the closed end of the body and bearing indicia visible through the transparent head.

3. A stopper for fitting into the neck of a bottle or jar, comprising a hollow cylindrical resilient body moulded of polyethylene, said body having a thin cylindrical wall the outer surface of which has a plurality of circular reinforcing ribs moulded therearound which prevent longitudinal creases occurring in the thin wall of the body when the stopper is inserted into the neck of a bottle or jar, said ribs being spaced apart to leave areas of the thin wall of the body therebetween, an integral end wall closing the upper end of said cylindrical wall, the lower end thereof being open, a head member separate from the body and made of a rigid transparent material with a cylindrical cavity on its underside receiving the closed upper end of the body, and projections in the internal surface of the side walls of said cavity in the head engaging in at least one recess in the body adjacent the closed upper end to secure the head to the body, said projections being saw-tooth like in shape with tapering lower surfaces which interlock with at least one recess in the resilient body to prevent separation and a sheet of material indicia secured between the end wall of the body and the head and visible through the overlying transparent portion of the head.

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