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H. A. SKOV

2,098,555

TEARABLE CLOSURE

Filed April 24, 1934

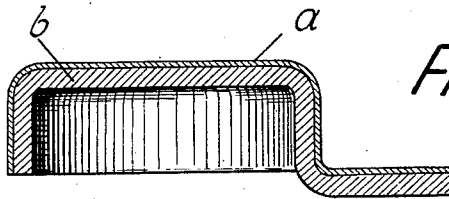


Fig. 1.

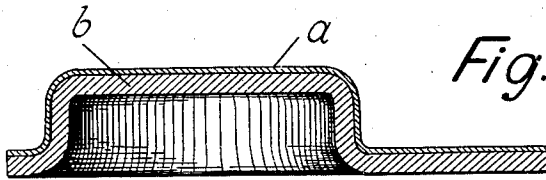


Fig. 2.

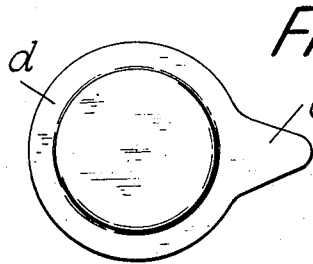


Fig. 3.

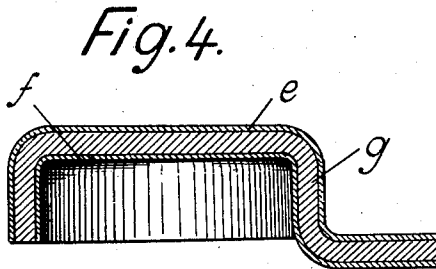


Fig. 4.

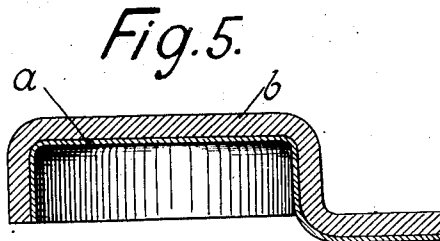


Fig. 5.

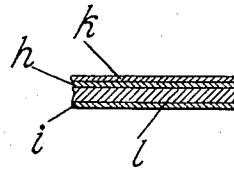


Fig. 6.

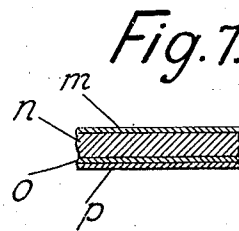


Fig. 7.

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TEARABLE CLOSURE

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2 Claims. (Cl. 215-42)

This invention relates to closures for containers and particularly to bottle and like caps which are adapted to be removed by tearing.

It has previously been proposed to form container closures or bottle caps exclusively of thin metal, for example aluminium having a thickness of about 0.1 mm. and provide them with a tab or finger grip by means of which the closure or cap may be opened by being torn. Such closures may be produced and applied without heating and their application may be effected merely by tightening, for instance, a wire loop around a closure placed on the neck of a bottle. When the wire loop or the like is tightened the closure is tightened over the mouth and the top of the neck of the bottle and at the same time it is drawn into the annular recess of the neck below the upper bead thereof.

Closures of the above kind consisting exclusively of metal, such as aluminium, are relatively expensive and attempts have been made therefore, to make substantially similar bottle closures from fibrous material such as pasteboard or similar cheap non-metallic material. These closures have the disadvantages that they must be shaped and applied with the use of heat, as otherwise they will not retain their shape.

The present invention concerns the manufacture of a closure adapted to be removed by tearing, which is cheaper than such closures consisting exclusively of aluminium, for example 0.1 mm. thick, and which consists mainly of non-metallic material, but which may, however, be shaped and applied without heating.

According to the invention a container closure or bottle cap having a finger grip by means of which it may be torn open, consists of one or more metallic layers adhered to one or more non-metallic layers, and its several layers are of such thickness that the metallic layer or layers are of the minimum or approximately the minimum thickness required to give the necessary stiffness to the closure per se to allow it to be produced and applied without heating. The said closure preferably consists for example of one or more aluminium layers, the thickness of which is between 0.02 and 0.06 mm., in combination with a cheap non-metallic material; it becomes therefore essentially cheaper than known closures of the same type which are composed of aluminium of a thickness of approximately 0.1 mm.

A closure according to the invention is produced in such a way that the combined layers of material make it practically as rigid as a similar closure consisting exclusively of thin metal, for example,

aluminium about 0.1 mm. thick, and therefore the non-metallic layer or layers of the closure will normally be thicker than the metal layer or layers thereof. A closure is therefore provided which is essentially cheaper than similar closures consisting exclusively of thin metal.

The present invention relates not only to the container closure, but also to the material from which the closure or cap is made.

It is not new per se to use several layers of material adhered together in a container closure or in a material for the production of container closures, as "crown cork" closures are known which consist of one or more metal layers adhered together with one or more layers of non-metallic material, such for example as paper. Such closures are however of a different type from a closure according to the invention for they are hard and of such thickness that they cannot be distorted by the hand, they are therefore adapted to be removed with a special prying tool, whereas a closure according to the invention is formed of a metallic layer which is soft and capable of being distorted by hand as it is of that type which is adapted to be removed by tearing.

According to the invention the agglutinant by which the layers of a closure or material are stuck together may be an independently applied agglutinant or an agglutinant forming part of the non-metallic layer or layers of the material. Alternatively one or more of the non-metallic layers may consist of materials adhering automatically to the metal when applied thereto, for instance the closure or material may be provided with a surface layer of a lac-like composition.

The invention further consists in the new or improved feature, combination and arrangement of parts of several forms of closures which will now be described with reference to the accompanying drawing in which:—

Fig. 1 shows on an enlarged scale a section through a common bottle capsule provided with a tab serving to tear off the capsule in order to open the bottle, the capsule consisting of a multi-layer material comprising only one very thin layer of metal, such as aluminium.

Fig. 2 is also an enlarged sectional elevation of a closure provided with a stiffening flange and consisting of the same multi-layer material as the closure according to Fig. 1.

Fig. 3 is a plan view of the closure shown in Fig. 2 on a smaller scale.

Figs. 4 and 5 show sectional elevations of closures corresponding to Fig. 1 but formed in a different manner therefrom.

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Figs. 6 and 7 are diagrammatic sections through the multi-layer material in two further embodiments of the invention.

Both in Fig. 1 and in Fig. 2 the closure consists of an outer or surface layer *a* of metal, for example aluminium or a corresponding material. The metal layer *a* is very thin and need only be a few hundredths of a millimeter thick, to give, together with the inner or bottom layer *b*, the necessary stiffness to the closure per se in order to enable it to be shaped and applied without being heated. The metal layer *a* may for example, consist of aluminium rolled out to a thickness of between 0.02 and 0.06 mm. The bottom layer *b* is adhered to the metal layer *a* by a suitable agglutinant or by means of its own adhesive power and it consists of a relatively thick layer of material such as paper parchment, cardboard or another suitable material. The bottom layer *b* is normally more than twice as thick as the surface layer *a*, being from 0.1 to 0.3 mm. or more thick. Thus the total thickness of the multi-layer material may be from 0.15 to 0.4 mm. apart from agglutinant, depending on the strength required by the use to which the closure is to be put. For the choice of the relative thickness of the metal layer *a*, and of the inner paper or like layer *b*, regard is taken of the fact that the whole multi-layer material must have the necessary stiffness and be able to be shaped cold, and that the metal layer *a* must be as thin as possible, so as to reduce the manufacturing cost of the closure.

Fig. 3 is a plan view of the closure represented in Fig. 2 in sectional elevation and shows how the tab serving to tear such a closure projects from the flange *d*. The bottom layer *b* of the closure represented in Figures 1 and 2, which consists of paper cardboard or the like, may be formed from several layers of material. Normally the bottom layer *b* is treated with paraffin, lac or a corresponding substance or made resistant to liquids in some other way before or after the formation of the closure. For the bottom layer *b* materials may also be used which are in themselves sufficiently impervious to moisture. The closures are normally made from a multi-layer material blank of plate-shape, but nothing prevents the closures from being manufactured exclusively from very thin metal plates corresponding to the surface layer *a* and applying the non-metallic layer *b* later, but it need not necessarily be applied to the bottom face of the tab *c* which serves to tear off the closure.

The closure represented in Fig. 4 differs from those shown in Figs. 1 and 2 only in that the closure or the material from which it is made is a multi-layer material with metallic top and bottom layers *e* and *f* respectively and with an intermediate layer *g* of non-metallic material of a suitable kind. The two metal layers *e*, *f* are made of the least possible total thickness, approximately that of the single metal layer *a* in Figs. 1 and 2.

Fig. 5 illustrates a closure made from the same two-layer material as employed for the manufacture of the closure according to Figs. 1 and 2, and differs therefrom only in that the metal layer *a*

is an inner or lower layer, while the thicker non-metallic layer *b* is an upper or outer layer.

Fig. 6 shows diagrammatically a multi-layer material according to the invention consisting of two thin metal layers *h*, *i* corresponding together in thickness to the metal layer *a* shown in Figures 1 and 5. In Fig. 6 *k* represents a surface or outer layer of a suitable lac-like consistency, while the layer *l* placed between the metal layers *h*, *i* is an intermediate layer of fibre material, such for example as paper or other suitable material.

Fig. 7 shows an upper covering layer *m* of some material giving a fine outer surface to the multi-layer material. A layer *n* is formed of paper or another corresponding material, while the necessary thin aluminium layer *o* is covered on its lower side with a layer *p* of material such as "Cellophane".

The invention is not limited to the constructional forms of the closure or multi-layer material as illustrated, the main principle of the invention residing exclusively therein that I employ a combination of one or more metal layers which are essentially thinner than that from which closures of the same type are normally made, and another or other non-metallic layers, the stiffness and strength of the material per se being suited to the intended use of the closure, while at the same time the least possible total thickness of the metal layer or layers is employed while ensuring that the material per se is of such stiffness that the closures may be made and applied without heating this not being the case with closures consisting exclusively of non-metallic materials.

I claim:—

1. A container closure in the form of a bottle cap, of the type which is adapted to be removed by tearing by means of a hand grip and formed of a material the strength of which corresponds to the strength of solid aluminium in a thickness of about 0.10 mm. consisting of at least one metallic layer and at least one thicker layer of non-metallic material adhesively secured to the metallic material, the metallic material containing metal of a thickness between 0.02 and 0.06 mm. while the thickness of the non-metallic material is on the one hand at least so great that the metallic and non-metallic layers have together a strength corresponding to that of aluminium of a thickness of about 0.10 mm. and on the other hand is not greater than to enable the material of the closure to retain its shape after being shaped and applied in a cold state.

2. A bottle cap having an integral laterally extending tear flap and formed of material substantially equal in strength to aluminium of 0.10 mm. thickness but consisting of metallic and non-metallic layers secured together adhesively, wherein the metallic portion of the cap does not exceed 0.06 mm. in thickness and the non-metallic portion of the cap is of no greater thickness than is required to render the cap strong enough to retain its shape after being shaped and applied in a cold state.

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