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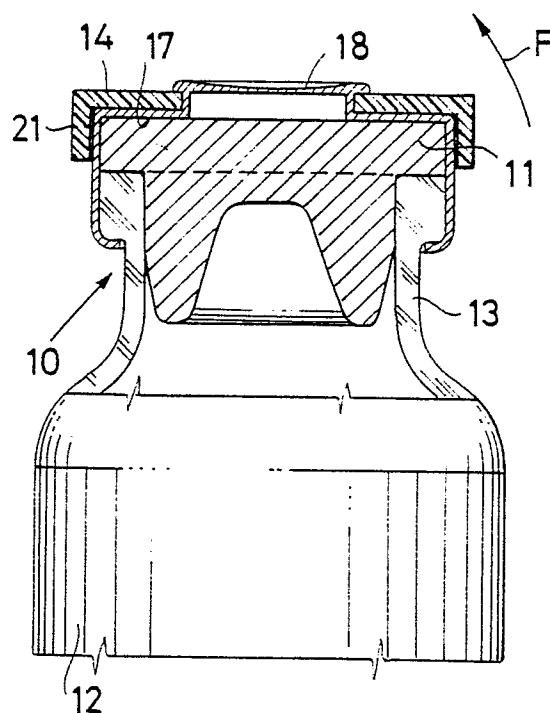
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BE CH DE FR GB LI NL SE(71) Applicant: Bojardi, Tiziano
Viale Indipendenza, 39
I-20090 Trezzano S/N (Milano)(IT)(72) Inventor: Bojardi, Tiziano
Viale Indipendenza, 39
I-20090 Trezzano S/N (Milano)(IT)(74) Representative: Martegani, Franco
Ing. GUZZI e RAVIZZA S.r.l. Via Boccaccio,
24
I-20123 Milano(IT)

(54) Metal cap with improved means for its partial or total removal, particularly for medicinal product containers.

(57) A closure for containers comprises a stopper or liner held in place by a metal crimped to the mouth of the container into which the stopper or liner is inserted as a seal. Said cap has in its upper portion a circular raised part onto which is placed and secured a tear off crown for removing said cap, either partially or totally, which crown has a gripping-edge which partially overtops the skirt of said cap. The base of said raised part is provided with an annular line of least resistance surrounding it.

Fig. 1



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**"METAL CAP WITH IMPROVED MEANS FOR ITS PARTIAL OR TOTAL REMOVAL, PARTICULARLY FOR
MEDICINAL PRODUCT CONTAINERS"**

The present invention relates to a metal cap closure which incorporates in a characteristic manner means which allow it to be simply and rapidly removed, either partially or totally, from the container to which it is applied, in particular vials or bottles containing liquid medicinals.

Closures of such kind are known which consist of a metal cap to which is given the dual task of holding stably in place the seal stopper or liner of the container and acting, owing to its intactness, as proof of the integrity of the said seal stopper or liner and thus also of the integrity of the container as to sterility and other aspects of quality.

However, though fulfilling these functions satisfactorily, such caps must also be able to be opened by users of the containers to which they are applied with the greatest ease and safety and without the use of makeshifts, which is often the case.

The overall object of the present invention is to embody a cap that will adequately satisfy the aforesaid two conflicting requirements and which is at the same time simple and economical in construction.

To attain this object, the present invention embodies a closure for containers comprising a stopper held in place by a metal cap crimped onto the mouth of the container into which the said stopper is inserted as a seal, the said cap featuring in its upper portion a substantially circular raised part into which is inserted, and secured by riveting of the circular raised part, a tear-off crown for partial or total removal of the said cap, which crown has a gripping-edge which partially overtops the skirt of said cap, wherein provision is made at the base of the said raised part for an annular line of least resistance surrounding it.

The line of least resistance can also be open and continue in two parallel lines in the top and skirt of the cap.

The structural and functional characteristics of the closure according to the present invention will become more apparent from an examination of the following description, referred to the appended drawings, in which:

-Figure 1 is a sectional view illustrating the said closure applied to a container;

-Figure 2 is an exploded view of the closure in Figure 1, prior to its application to the container;

-Figure 3 is a plan view of the metal cap alone;

- Figure 4 is a view as in Figure 1, illustrating the manner of opening the cap.

With reference to the drawings, the closure in question is indicated overall by 10 and consists structurally of three parts: a liner or stopper 11 for sealing a container 12, a metal cap 13 for keeping the liner or stopper 11 stably in place, and a plastics material crown 14 which is secured to the cap 13 for the partial or total removal of this latter, in the manner that will hereinafter be explained.

The liner or stopper 11 is of traditional type, made of rubber or an elastomer, and is inserted with interference in the mouth 15 of the container 12.

The metal cap 13 is formed by pressing of a disk, for example a disk made of aluminium, and comprises a skirt 16 with a top 17 from the upper side of which projects a central head or raised part 18, of smaller diameter.

At the base of the said raised part 18 provision is characteristically made for an annular line of least resistance 19, which can optionally continue in two parallel lines of least resistance 20 in the top and skirt of the cap, as is clearly shown in Figures 2 and 3 of the drawings.

On the said raised part 18, in the condition illustrated in the enlarged view 2, is secured the annular crown 14 which is held in place in a stable manner by riveting thereon of the raised part 18, as shown in Figure 1. The crown 14 also features a gripping-edge 21 which partially overtops the skirt 16 of the cap.

The manner of opening the cap according to the invention will be clear from the foregoing description with references to the drawings, and is as follows.

The annular edge 21 of the crown 14 is gripped and pulled in the direction of the arrow F in Figure 1 in a position diametrically opposed to the lines of least resistance 20, if present; to this end the raised part 18, or the crown 14 will bear a suitable indication.

As a result of the tractive force applied to the crown 14, which force is transmitted to the underlying cap which is solid with the crown 14, there will first be caused a fracture of the annular line of least resistance 19 and then of the optional parallel lines 20 (Figure 4), until the cap 13 is wholly removed, which removal means that the stopper or liner 11 can be removed and access can be had the contents of the vial or bottle 12.

When it is not necessary to remove the stopper or liner 11, for example when the vials or bottles contain liquids that can be withdrawn by syringes the needles of which pierce the stopper, the parallel lines of least resistance 20 need not be

provided, since there will suffice the annular line of least resistance 19 the fracture of which will allow the removal solely of the raised part 18; in such case provision will also be made for a small crown adjacent the cap, the rest of the cap remaining in place, and solidly restraining the stopper to the mouth of the vial or bottle. 5

Claims

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1) A closure for containers comprising a stopper or liner held in place by a metal crimped to the mouth of the container into which the stopper or liner is inserted as a seal, the said cap having in its upper portion a circular raised part onto which is placed and secured a tear off crown for removing said cap, either partially or totally, which crown has a gripping-edge which partially overtops the skirt of said cap, wherein the base of said raised part is provided with an annular line of least resistance surrounding it. 15 20

2) A closure as described in claim 1, wherein the said annular line of least resistance is open and continues in two parallel lines in the top and the lateral skirt of the metal cap. 25

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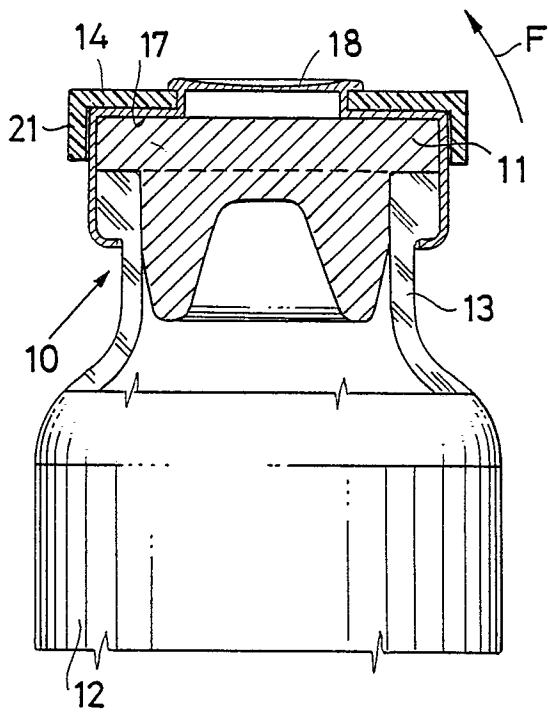
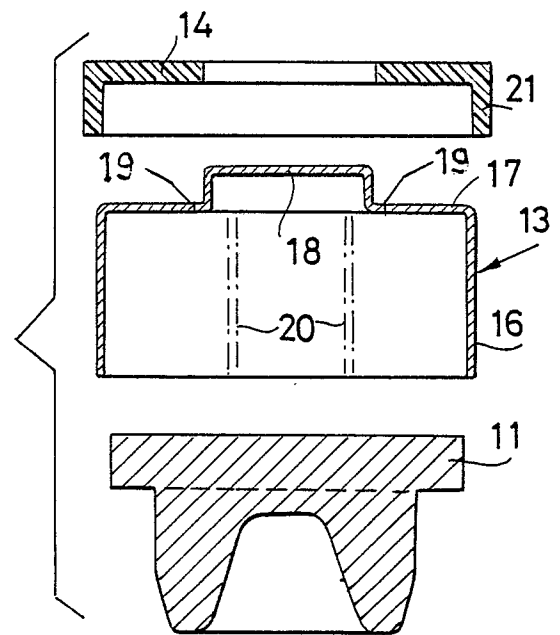
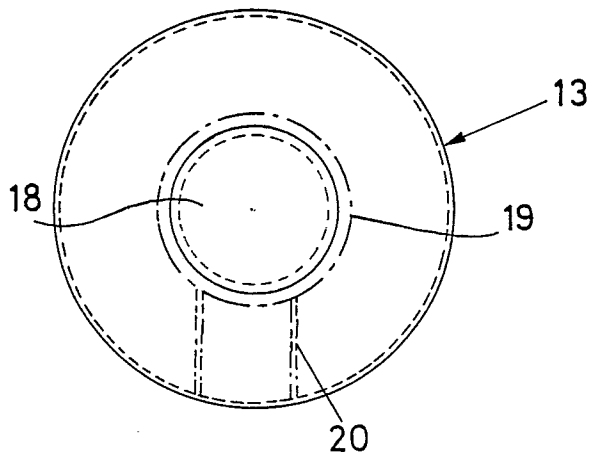
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Fig. 1Fig. 2Fig. 3Fig. 4