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(12) # EUROPEAN PATENT SPECIFICATION

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(54) **Closing ring for a metal can with a lid.**

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GB-A- 383 568
GB-A- 743 339
US-A- 2 107 179

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EP 0 516 206 B1

Description

The invention relates to a closing ring for clampingly fixing a lid on the bead of a metal can, as in the preamble of claim 1. Such a closing ring is known from e.g. US-A-2 107 179.

The invention has for its object to embody a closing ring such that the reliability of the closure is improved. This reliability is expressed in the maximum height through which a filled can can fall without the lid springing off the can.

For this purpose the closing ring according to the invention is characterized in that the overlapping ends comprise corresponding, mutually engaging patterns on at least one axial side,

a pattern is a notched edge, and

the notched edge of the one end comprises lips which engage into recesses in the other end.

In order to be able to grip the pull tab easily the closing ring can have the feature that the pull tab has a hole on its free end. A still greater facility in gripping the pull tab is obtained with an embodiment in which a larger, second hole is situated in the band below the hole of the pull tab. This latter variant can also be very practical for use in combination with a can the bead of which has a peripherally running recess. Reference is also made in this respect to applicant's Netherlands patent application which is being filed with the Dutch Patent office on the same day as this patent application under the title "Metal can having a bead".

A practical embodiment is that in which the pull tab is narrower than the band and is bounded at the sides by two weakening lines which extend parallel in lengthwise direction and which each connect on their end remote from the free end of the pull tab to an additional weakening line running to the sides of the band.

This embodiment has the particular feature that the additional weakening lines are situated in the region of the overlap. This embodiment combines easy tearing off with a great tensile strength.

The invention will be further elucidated with reference to the annexed drawing, in which:

figure 1 shows a paint can of the so-called conical type with a closing lid drawn at a distance therefrom and around which a closing ring is arranged;

figure 2 shows the paint can according to figure 1 in the situation in which the lid is placed on the can and the underside of the closing ring is pressed inward to form a seal;

figure 3 shows on enlarged scale the detail III in cross section;

figure 4 is a schematic view of a closing ring according to the invention;

figures 5a, 6a, 7a show views corresponding with figure 4 of alternatives;

figures 5b, 6b and 7b show notched edges;

figures 5c, 6c, 7c show mutually engaging perforations along the weakening lines;

figures 5d, 6d, 7d show the section A-A as according to the figures 5c, 6c and 7c respectively; and

figures 5e, 6e, 7e show the section B-B as according to the figures 5c, 6c, 7c respectively.

Figure 1 shows a metal can 1 according to the prior art comprising a bottom 2 and, connected thereto, a standing wall 3 in which the zone remote from the bottom 2 comprises an outward extending bead 4 (also see figure 3) having in section a first part 5 extending through about 360°, a second part 6 lying against the first part 5 and extending through about 90°-120° and a third part 7 connecting thereto with a considerably smaller radius of curvature.

Figure 1 shows the can 1 before it is closed by a lid 8.

Figure 2 shows the can 1 after it has been closed by the lid 8.

Figure 3 shows the manner in which the lid 8 co-acts with the can 1. A filler mass or compound 10 is situated between the rim 9 of the lid 8 and the top surface of the bead 4. This mass serves to seal the lid 8 relative to the can 1.

After the lid 8 is placed on the can 1 the connection is reinforced by means of an encircling closing band 11. This grips around the rim 9 and the bead 4, as is clearly shown in figure 3.

Figure 4 shows a closing ring 12 according to the invention. This closing ring comprises a band 13 of metal which extends over more than the periphery of the bead 4 and the lid 8 such that the ends of the band 13 have in common an overlapping zone 14 where these ends are mutually connected. The outer end of band 14 has a pull tab 15 with a hole 16 therein such that the pull tab can be gripped with a pin, screwdriver or other suitable object. The connection between the ends of the band 13 in the overlapping zone 14 in this embodiment is such that the ends of the band have in common a bead 15, 16 in the zone 14 on both axial ends.

Figure 5a shows a variant in which a closing ring 17 has an overlapping zone 18 in which the ends of the band 19 forming the closing ring 17 are mutually joined by the beads 15, 16 and wherein the outer portion thereof moreover has a pattern of lips 20 having free zones 21 situated there-between.

Figure 5b shows similar recesses 123 into which the lips 20 can engage. The closing ring 17 hereby possesses a great peripheral tensile strength. It can nevertheless be broken by tearing loose a pull tab 22 in more or less radial direction along weakening lines 23.

Figures 5c, 5d and 5e show the manner in which the weakening lines 23 are embodied.

Figure 6a shows a closing ring 24 comprising a band 25, the ends of which mutually overlap in a zone 26. Situated at the location of the overlapping zone is a pull tab 27. Below the hole 16 in pull tab 27 the underlying portion of the band 25 has a hole 28. This embodiment is particularly practical in the use of a metal can with a bead on the upper part having a recess on its peripheral zone located furthest to the outside. A pointed object, for instance a pin, a screwdriver or the like can thus be inserted through the hole 16, through the hole 28 into the said recess in the underlying bead. The pull tab 27 can hereby be removed easily in more or less radial direction along the weakening lines.

Figure 7a shows a variant wherein a pull tab 29 extends
with its hole 16 beyond the overlapping zone 30.

Claims

1. Closing ring (17) for clampingly fixing a lid (8) on the bead (4) of a metal can (1), said closing ring (179 comprising a band (13) adapted to engage round the top rim (9) of the lid (8) and the lower edge of the bead (4) and to extend over more than the periphery of the bead (4) and the lid (8) such that the ends of the band (13) have in common an overlapping zone (14) where the ends are mutually connected, the outer end of the band (13) having a pull tab (22) and the ends of the band (13) having a bead (15, 16) in common in the overlapping zone (14) on both axial ends,
   characterized in that
   the overlapping ends comprise corresponding, mutually engaging patterns (21,123) on at least one axial side,
   the patterns comprise a notched edge, and
   the notched edge of the one end comprises lips (20) which engage into recesses (21) in the other end.

2. Closing ring as claimed in claim 1,
   characterized in that the pull tab (22) has a hole (16) on its free end.

3. Closing ring as claimed in claim 2,
   characterized in that a larger, second hole (28) is situated in the band (25) below the hole (16) of the pull tab (22).

4. Closing ring as claimed in claim 1,
   characterized in that the pull tab (27) is narrower than the band (25) and is bounded at its sides by two weakening lines (23) extending parallel in lengthwise direction and each connecting on its end remote from the free end of the pull tab (27) to an additional weakening line running to the sides of the band (25).

5. Closing ring as claimed in claim 4,
   characterized in that the additional weakening lines are situated in the region (14) of the overlap.

Patentansprüche

1. Schließring (17) zum klammernden Befestigen eines Deckels (8) auf dem Wulst (4) einer Metalldose (1), wobei der Schließring (17) ein Band (13) enthält, das zum Eingriff um die obere Einfassung (9) des Deckels (8) und die untere Kante des Wulstes (4) und zum Erstrekken über mehr als den Umfang des Wulstes (4) und des Deckels (8) ausgelegt ist, so daß die Enden des Bandes (13) eine Überlappzone (14) gemeinsam haben, in der die Enden miteinander verbunden sind, wobei das äußere Ende des Bandes (13) eine Zuglasche (22) hat und die Enden des Bandes (13) in der Überlappzone (14) an beiden axialen Enden einen Wulst (15, 16) gemeinsam haben,
   dadurch gekennzeichnet,
   daß die überlappenden Enden entsprechende, gegenseitig ineinandergreifende Gestaltungen (21,123) an wenigstens einer axialen Seite enthalten, die Gestaltungen eine gekerbte Kante enthalten, und die gekerbte Kante des einen Endes Lippen (20) enthält, die in Ausnehmungen (21) im anderen Ende eingreifen.

2. Schließring nach Anspruch 1,
   dadurch gekennzeichnet, daß die Zuglasche (22) an ihrem freien Ende ein Loch (16) hat.

3. Schließring nach Anspruch 2,
   dadurch gekennzeichnet, daß in dem Band (25) unter dem Loch (16) der Zuglasche (22) ein größeres zweites Loch (28) angeordnet ist.

4. Schließring nach Anspruch 1,
   dadurch gekennzeichnet, daß die Zuglasche (27) schmaler als das Band (25) und an ihren Seiten durch zwei Schwachstellenlinien (23) angebracht ist, die sich parallel in Längsrichtung erstrecken und von der jede an ihrem vom freien Ende der Zuglasche (27) entfernt liegenden Ende mit einer zusätzlichen Schwachstellenlinie verbunden ist, die zu den Seiten des Bandes (25) verläuft.

5. Schließring nach Anspruch 4,
   dadurch gekennzeichnet, daß die zusätzli-

chen Schwachstellenlinien im Bereich (14) des Überlapps angeordnet sind.

Revendications

1. Anneau de fermeture (17) destiné à la fixation de façon serrée d'un couvercle (8) sur le cordon de soudure (4) d'une boîte métallique (1), ledit anneau de fermeture (17) comprenant une bande (13) apte à venir en contact autour du rebord supérieur (9) du couvercle (8) et du bord inférieur du cordon de soudure (4) et à s'étendre au-delà de la périphérie du cordon de soudure (4) et du couvercle (8) de telle sorte que les extrémités de la bande (13) ont en commun une zone débordante (14) où les extrêmités sont reliées entre elles, l'extrêmité extérieure de la bande (13) comportant une languette (22) à tirer et les extrêmités de la bande (13) ayant un cordon de soudure (15,16) en commun dans la zone débordante (14) sur les deux extrêmités axiales,
   caractérisé en ce que :
   - les extrêmités débordantes comprennent des motifs correspondants (21,123) qui viennent en contact mutuel sur au moins un côté axial,
   - les motifs comprennent un bord entaillé, et
   - le bord entaillé de l'une des extrêmités comprend des lèvres (20) qui viennent en contact avec des évidements (21) à l'autre extrêmité.

2. Anneau de fermeture selon la revendication 1, **caractérisé en ce que** la languette (22) à tirer comprend un trou (16) sur son extrêmité libre.

3. Anneau de fermeture selon la revendication 2, **caractérisé en ce que** un second trou (28) plus grand se trouve dans la bande (25) au-dessous du trou (16) de la languette (22) à tirer.

4. Anneau de fermeture selon la revendication 1, **caractérisé en ce que** la languette (27) à tirer est plus étroite que la bande (25) et est limitée au niveau de ses côtés par deux lignes fléchies (23) qui s'étendent parallélement dans la direction longitudinale, chacune étant reliée sur son extrêmité éloignée de l'extrêmité libre de la languette (27) à tirer, à une ligne flèche supplémentaire qui s'étend vers les côtés de la bande (25).

5. Anneau de fermeture selon la revendication 4 **caractérisé en ce que** les lignes fléchies supplémentaires sont situées dans la zone (14) de la partie débordante.

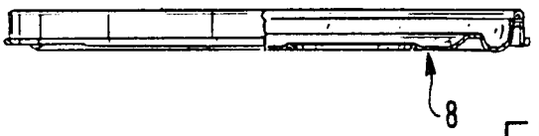
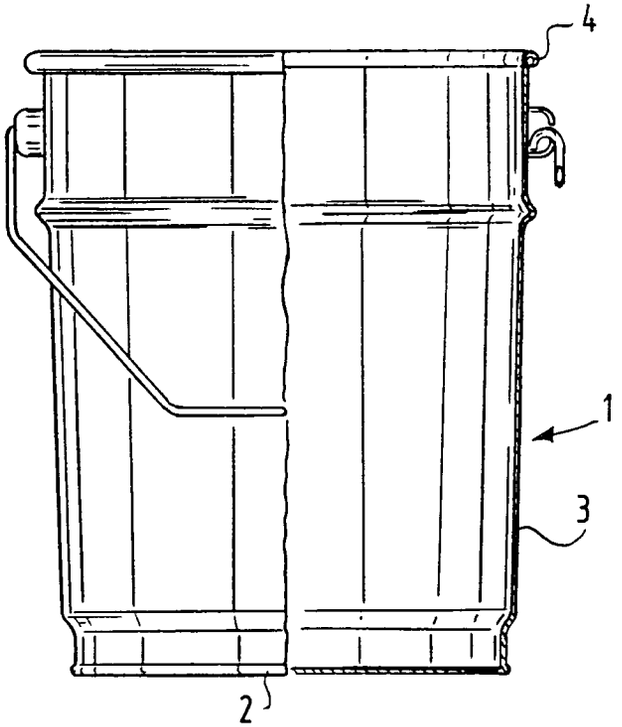


FIG.1



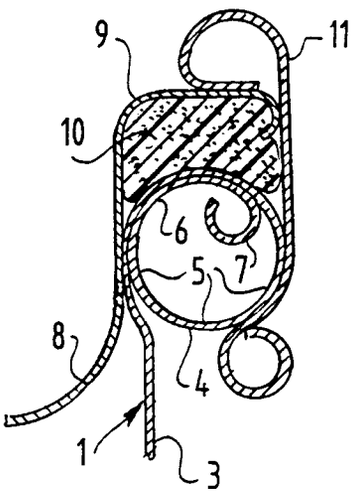


FIG.3

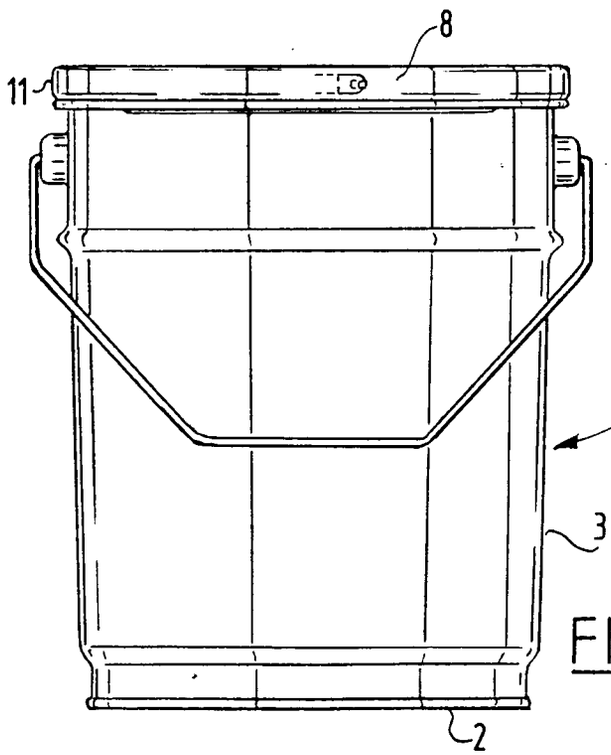


FIG.2

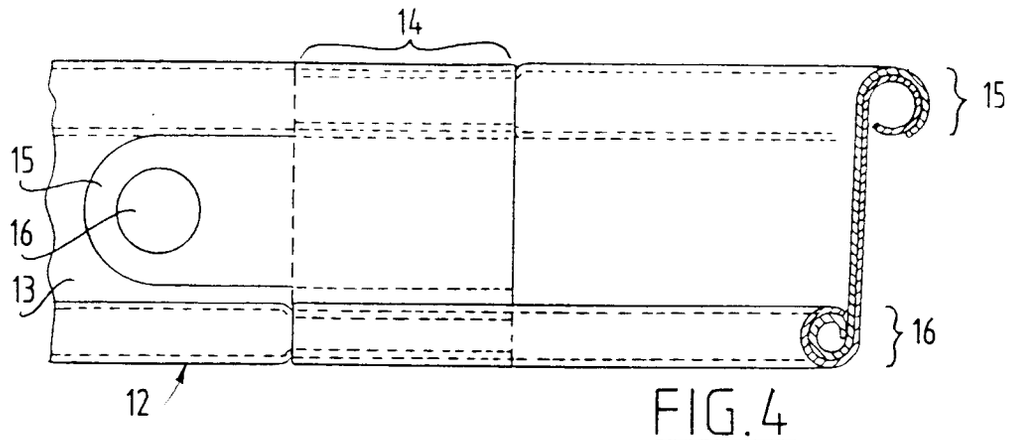


FIG.4

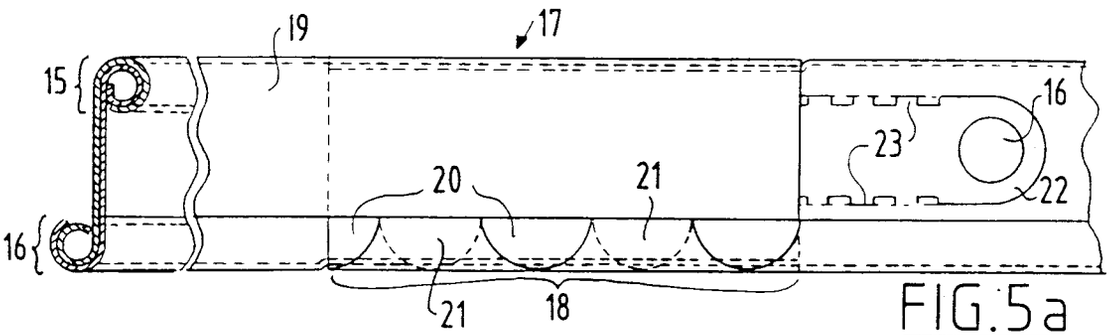


FIG.5a

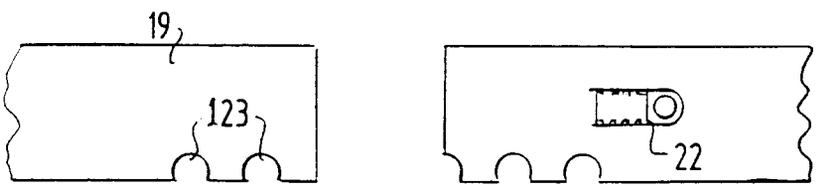


FIG.5b

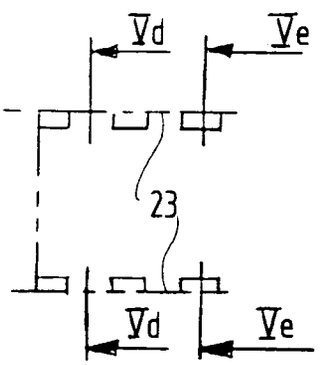


FIG.5c

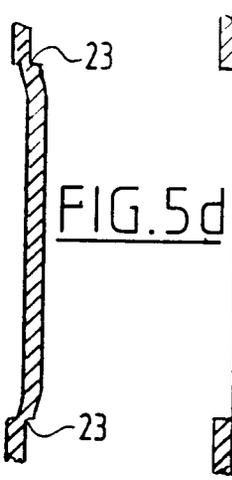


FIG.5d FIG.5e

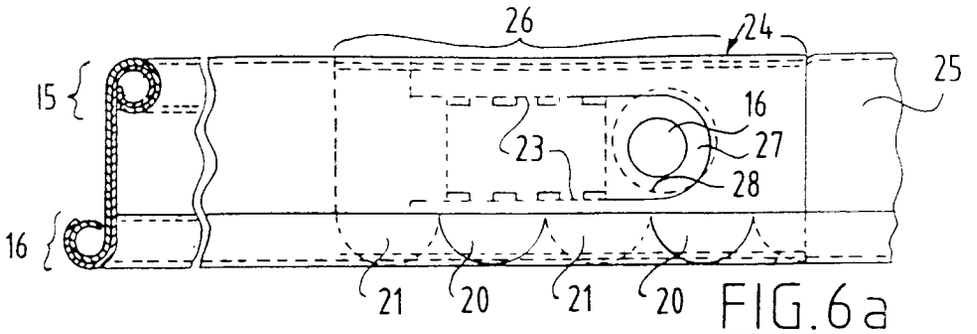


FIG.6a

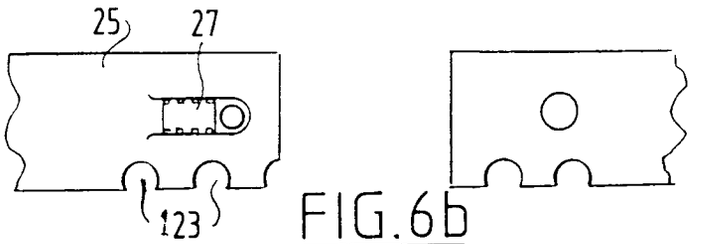


FIG.6b

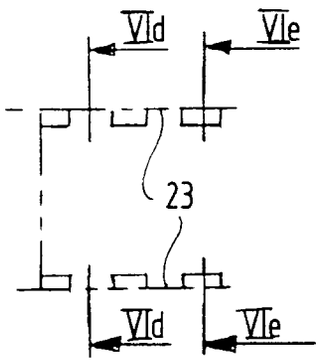


FIG.6c

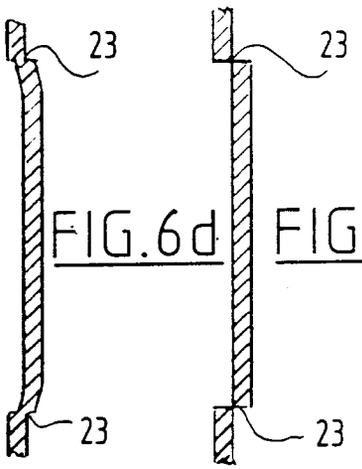


FIG.6d FIG.6e

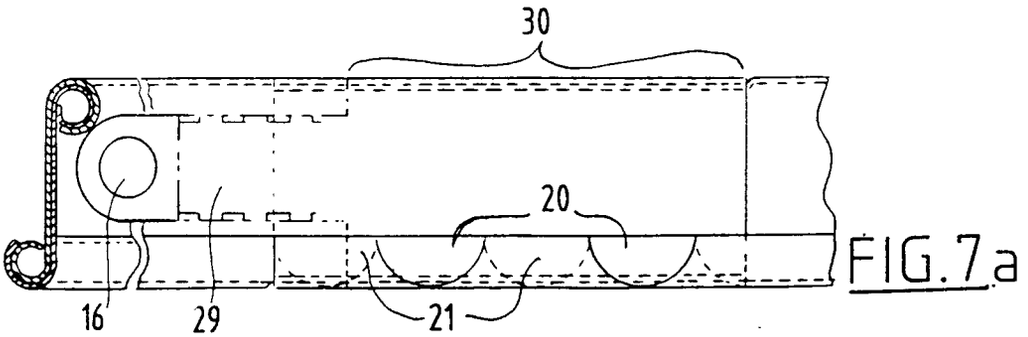


FIG.7a

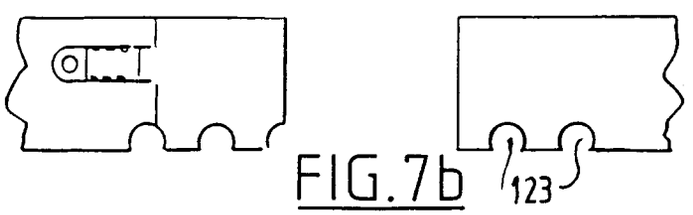


FIG.7b

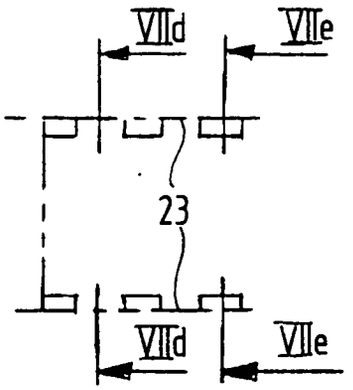


FIG.7c

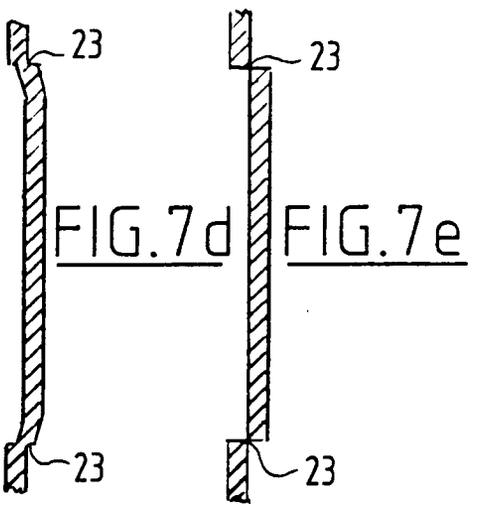


FIG.7d FIG.7e