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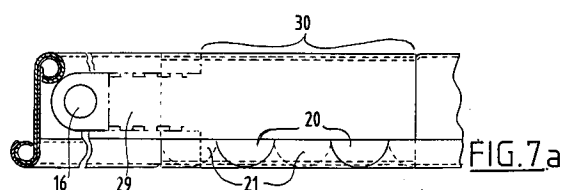
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NL-2517 GK The Hague(NL)**(54) **Closing ring for a metal can with a lid.**

(57) A closing ring (11) for clampingly fixing a lid (8) on the bead (4) of a metal can (1), characterized in that the closing ring (11) comprises a band which engages round the top rim of the lid (8) and the lower edge of the bead (4) and extends over more than the periphery of the bead (4) and the lid (8) such that the ends of the band have in common an overlapping zone (30) where the ends are mutually connected, and that the outer end of the band has a pull tab (29).

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The invention relates to a closing ring for clampingly fixing a lid on the bead of a metal can. Such a closing ring is known.

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.

Generally for this purpose the closing ring according to the invention has the feature that the closing ring comprises a band which engages round the top rim of the lid and the lower edge of the bead and extends over more than the periphery of the bead and the lid such that the ends of the band have in common an overlapping zone where the ends are mutually connected, and that the outer end of the band has a pull tab.

The closing ring is prefabricated and placed with force over a temporarily closed can. Due to the gripping under the bead of the can with simultaneous pressing of the lid thereon, generally via a sealing mass or compound, a very robust clamping seal is realized. The can can be opened by breaking the closing ring. This breakage takes place by gripping the pull tab with force and pulling it sideways. The connection between both ends of the band is hereby broken.

The closing ring can have the particular feature that the ends of the band have a bead in common in the overlapping zone on both axial ends. The beading operation can take place such that the amount of beaded material corresponds to once the material thickness. This construction allows working of comparatively thick material.

The closing ring can have the particular characteristic that the pull tab can be separated from the associated end by breaking a weakening line bounding the pull tab.

In an embodiment in which the weakening line has perforations the advantage is achieved that it is relatively easy to remove the pull tab because the breaking takes place in stepwise manner. The tensile strength of the band is nevertheless great.

An extra strong coupling between the ends is obtained with a variant in which the overlapping ends comprise corresponding, mutually engaging patterns on at least one axial side.

This latter embodiment can for instance have the feature that a pattern is a notched edge, more particularly such that 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 and 8a show views corresponding with figure 4 of alternatives;

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

figures 5c, 6c, 7c and 8b show mutually engaging perforations along the weakening lines;

figures 5d, 6d, 7d and 8c show the section A-A as according to the figures 5c, 6c and 7c respectively; and

figures 5e, 6e, 7e and 8d show the section B-B as according to the figures 5c, 6c, 7c and 8b 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 3 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 5 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 therebetween.

Figure 5b shows similar recesses 23 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.

Figure 8a shows an alternative. In this embodiment the closing ring 30 is mutually adhered with its overlapping ends in the zone 31 by means of a spot weld 31.

Claims

1. Closing ring for clampingly fixing a lid on the bead of a metal can,
characterized in that
the closing ring comprises a band which engages round the top rim of the lid and the lower edge of the bead and extends over more than the periphery of the bead and the lid such that the ends of the band have in common an overlapping zone where the ends are mutually connected, and that the outer end of the band has a pull tab.
2. Closing ring as claimed in claim 1, **characterized in that** the ends of the band have a bead in common in the overlapping zone on both axial ends.
3. Closing ring as claimed in claim 1, **characterized in that** the pull tab can be separated from the associated end by breaking a weakening line bounding the pull tab.
4. Closing ring as claimed in claim 3, **characterized in that** the weakening line has perforations.
5. Closing ring as claimed in claim 2, **characterized in that** the overlapping ends comprise corresponding, mutually engaging patterns on at least one axial side.
6. Closing ring as claimed in claim 5, **characterized in that** a pattern is a notched edge.
7. Closing ring as claimed in claim 6, **characterized in that** the notched edge of the one end comprises lips which engage into recesses in the other end.
8. Closing ring as claimed in claim 3, **characterized in that** the pull tab has a hole on its free end.
9. Closing ring as claimed in claim 8, **characterized in that** a larger, second hole is situated in the band below the hole of the pull tab.
10. Closing ring as claimed in claim 3, **characterized in that** 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.

11. Closing ring as claimed in claim 10, **characterized in that** the additional weakening lines are situated in the region of the overlap.

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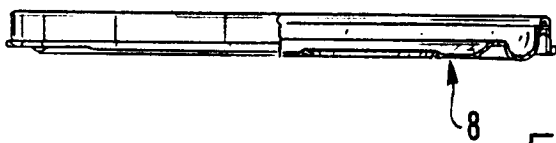


FIG.1

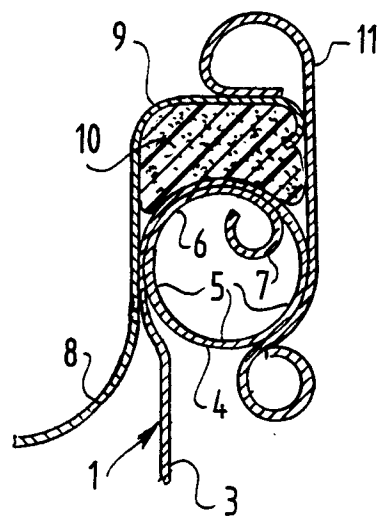
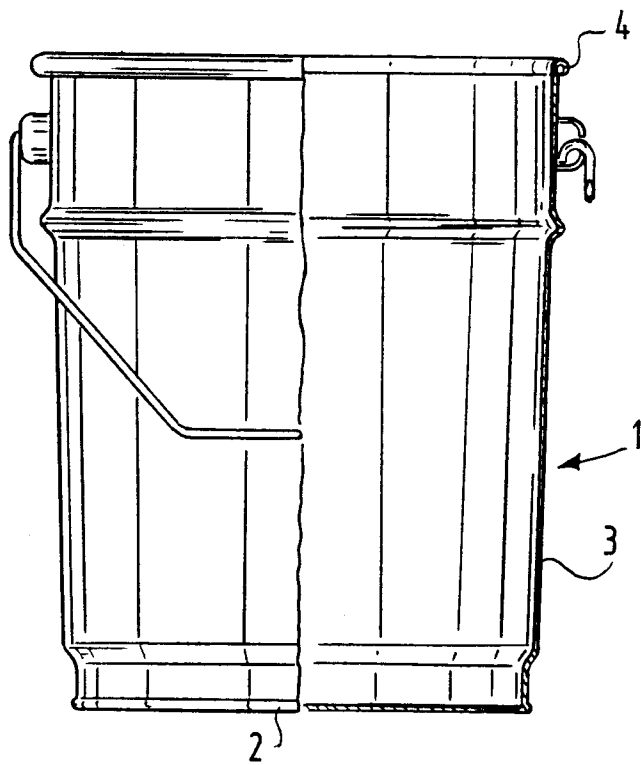


FIG.3

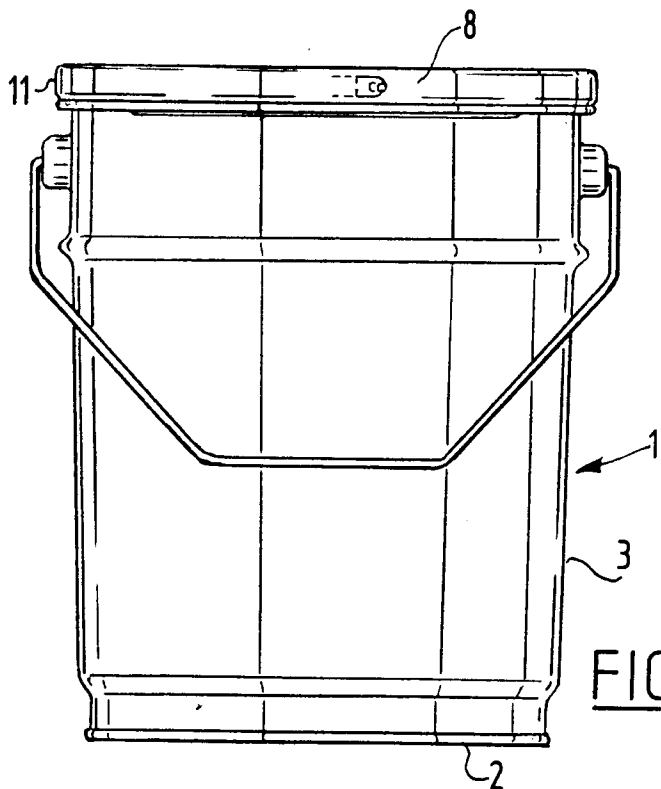
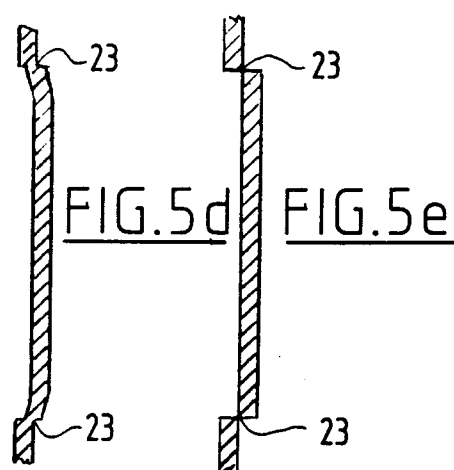
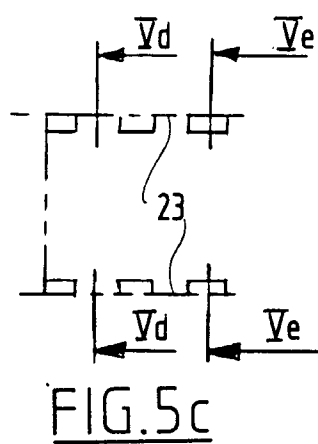
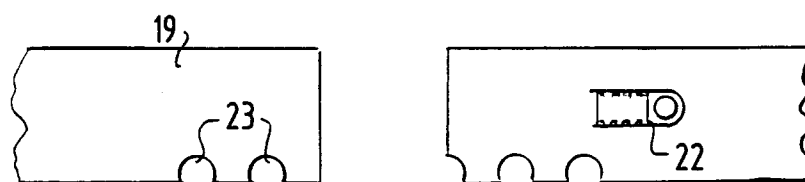
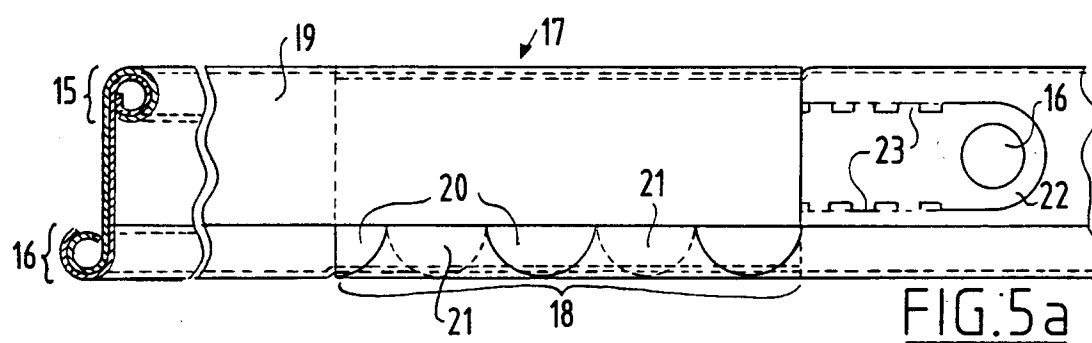
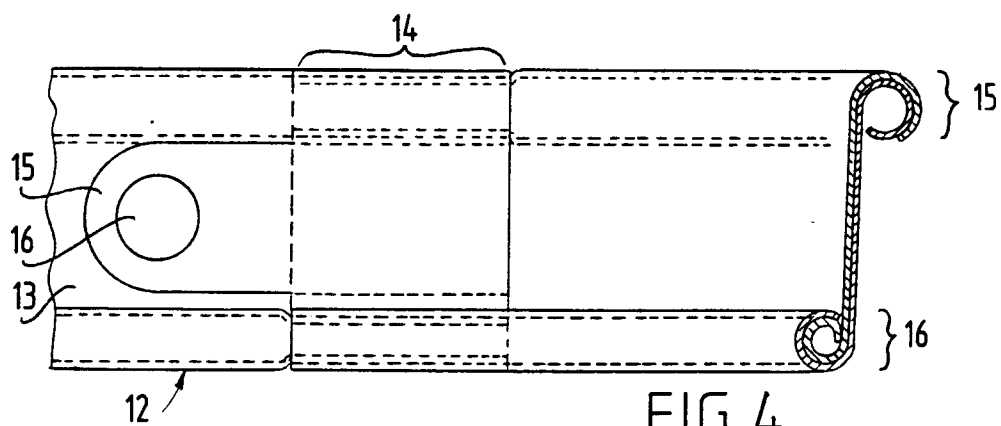
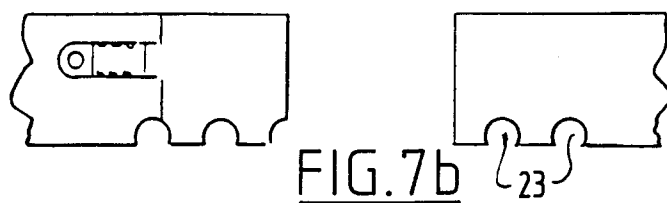
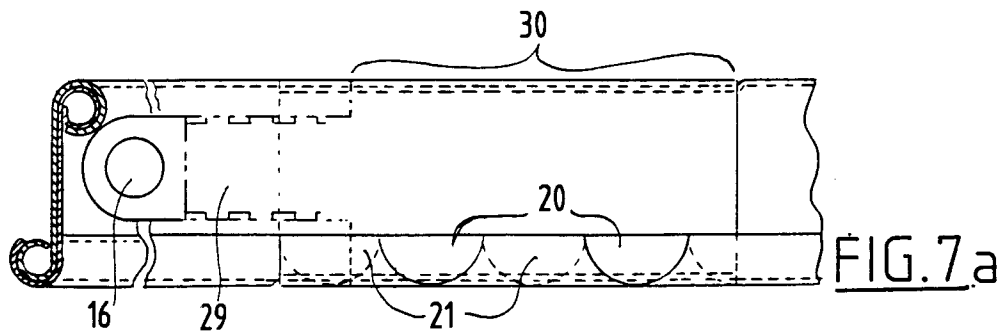
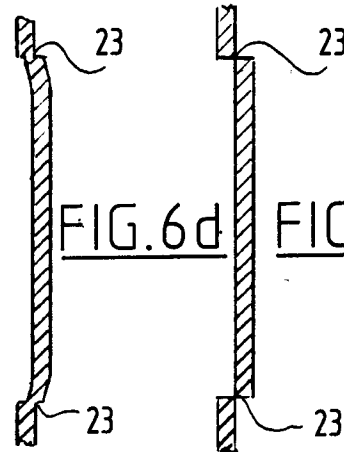
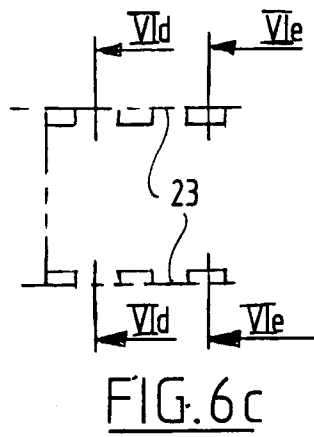
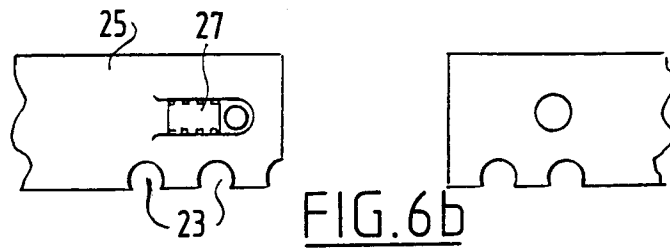
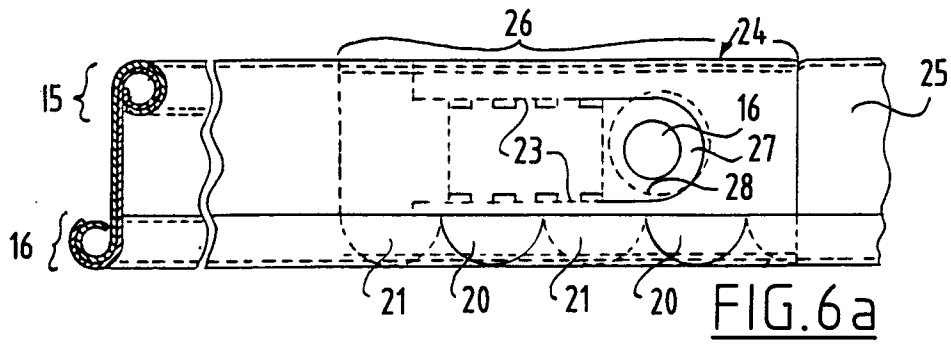
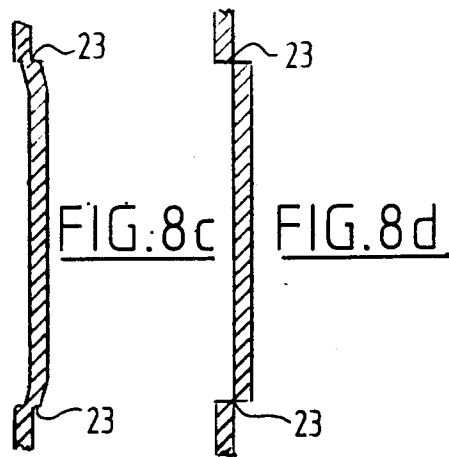
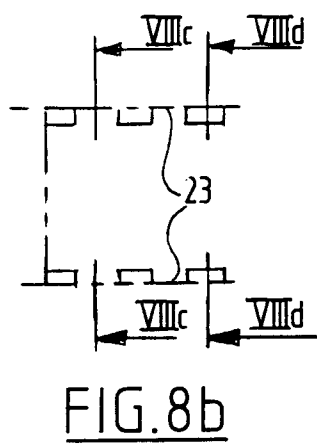
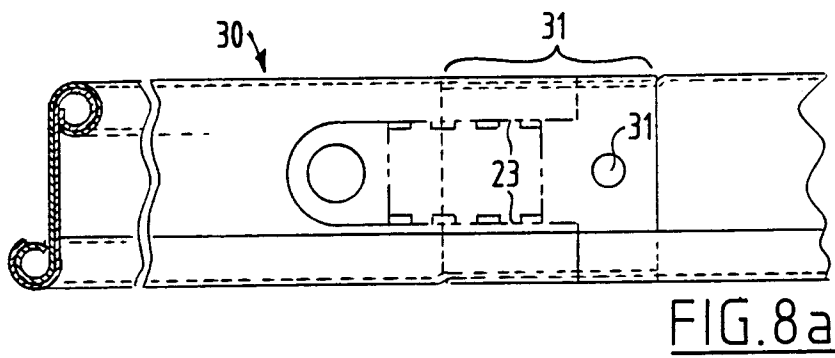
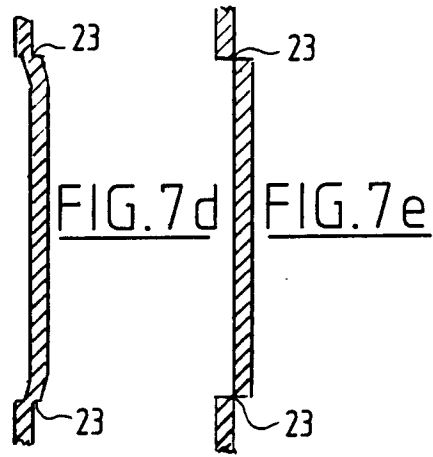
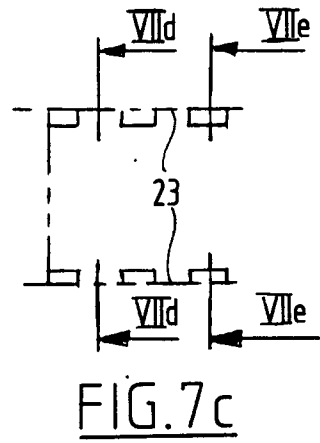


FIG.2









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EUROPEAN SEARCH REPORT

Application Number

EP 92 20 1279

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB-A-743 339 (COOKSON) * page 1, line 71 - line 80; figure 2 * * page 2, line 18 - line 23; figure 5 * ---	1	B65D55/08
X	GB-A-383 568 (FALTSHAUSER) * the whole document *	1,3-4, 10-11	
Y		8	
A		5-6	
X	US-A-2 107 179 (GIBBS) * page 2, left column, line 6 - line 71; figures 1,3-4 *	1-2	
Y		8	
A	DE-B-1 157 137 (J. A. SCHMALBACH AG) * column 1, last paragraph - column 2, paragraph 1; figure 2 * -----	1,5-7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 03 SEPTEMBER 1992	Examiner BRIDAULT A.A.Y.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			