(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 695 918 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.08.2006 Bulletin 2006/35

(51) Int Cl.:
B65D 43/02 *(2006.01)*

(21) Application number: **05101399.3**

(22) Date of filing: **24.02.2005**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

(71) Applicant: **Crown Packaging Technology, Inc**
Alsip, IL 60803-2599 (US)

(72) Inventors:
- **PHILIPPE, Michel**
  26500, Bourg les Valence (FR)
- **RICHEUX, Jean-Marc**
  69230, St Genis-Laval (FR)

(74) Representative: **Ratliff, Ismay Hilary**
CROWN Packaging Technology, Inc.
Downsview Road
Wantage, Oxfordshire OX12 9BP (GB)

(54) Easy open container and lid structure

(57) A lid structure comprising a metal lid in the form of a disc (20) and a plastics ring (1). A lug (6) on the ring is snap-fitted around the exposed edge (25) of the lid. The lid structure can be fitted onto a filled container by application of a downward force until a lower profile (7) on the ring is forced around a curl or other feature on the top edge of the container. Outward expansion of the lid structure provides further retention on the container.

The plastics ring of the lid structure has one or more weakened regions which can be torn to release the lid structure from the container without the need for any tool.

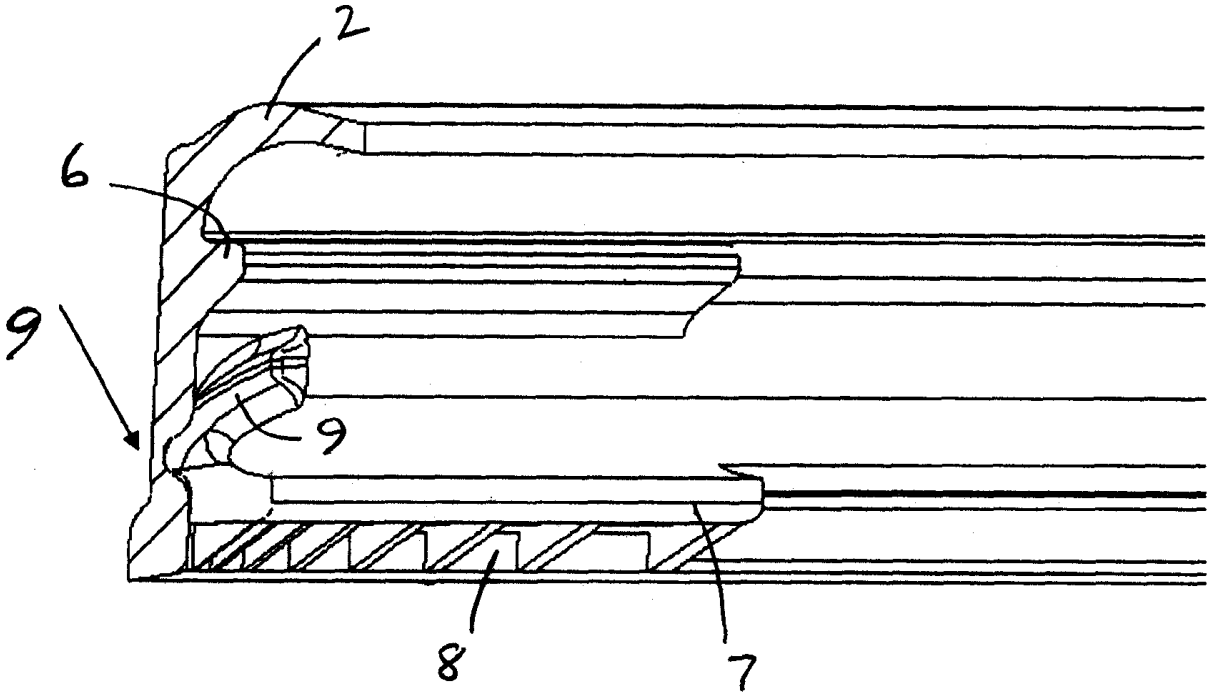

Fig. 3

EP 1 695 918 A1

Description

Technical field

[0001] This invention relates to an easy open container. In particular, but not exclusively it related to a lid structure for an easy open container for packaging liquids such as paint, or solids such as powders.

Background art

[0002] It is known to provide metal containers for packaging paint in which the container has a body with seamed or integral base, a metal ring which is seamed to the open end of the can body, and a press-on lid which can be opened by inserting a lever into a channel at the edge of the ring.

[0003] In an alternative design, the press-on lid has a U-shaped channel for inserting the lever, and a flange, which extends radially outwardly from the channel. A plastics ring is clipped over the raw edge of the lid and extends around an outwardly rolled circumferential edge flange of the can body when the lid is pressed down onto the can body.

[0004] Numerous arrangements of recess have been described but essentially all of these require the insertion of a tool to release an interlock between the lid and container body or ring. These designs rely on the lever opening principle and therefore require some form of tool in order to lever open the container. In some examples, the lever acts against a springy wall of the container, ring or lid so that the container is reclosable and there is minimal distortion of the container on opening.

Disclosure of the invention

[0005] According to the present invention, there is provided a manually removable lid structure comprising: a metal lid, having a centre panel and a outer wall terminating in a generally outwardly extending annulus; and

a plastics ring comprising an inwardly extending annular shoulder and a peripheral skirt depending from the shoulder, the skirt having an inwardly extending lug which clips against the edge of the lid with the shoulder extending over the lid annulus, and a lower profile which is complementary to the profile of the upper edge of a container body to which, in use, the lid structure is to be fixed; characterised by line of weakening along which at least part of the lower profile of the ring is manually deformable or tearable for opening the container to which the lid structure is attached.

[0006] In contrast with lever lids of the prior art, the plastics ring of the lid structure provides openability when the lid structure is fixed to a container, without the need for any tool. After tearing the lower ring profile, the lid structure is removable from the container, such that the container appears to the user to have only two parts.

[0007] The centre panel of the lid may be joined to the outer wall by a generally U-shaped channel. This prevents excessive intrusion of the lid structure into the headspace of the can body. Typically, sealing compound may be provided around the lid annulus and adjacent the outer wall.

[0008] The line of weakening is usually tearable and defines a tamper evident strip or band.

[0009] According to a further aspect of the present invention, there is provided an easy open container comprising: a metal can body having an open top ; the lid structure as described above, with the lower profile of the ring engaging the edge of the can body opening; in which the outer wall of the metal lid is seated within the container body and the outer wall and the container body have complementary outwardly extending beads, and in which, in use, the weakened part of the ring profile is operable manually removing the lid structure from the can body.

[0010] Typically, the can body has an outward curl at the edge of the opening so that the ring engages this can body curl. According to yet another aspect of the present invention, there is provided a method of sealing an easy open container, the method comprising:

placing the lid structure over the open end of a metal container body; applying downward pressure to force the lid and ring combination down onto the container body so that the lower profile of the plastics ring engages the upper edge of the container body and an outer wall of the lid is adjacent part of the container body side wall; and maintaining the downward pressure whilst applying a radially outward expansion force to deform the outer wall of the lid and the adjacent body wall into complementary beads.

[0011] Generally, the method may be used with a lid structure having a U-shaped channel so that an expandable tool may be inserted into the channel for applying radial force to the channel outer wall to form the beads.

Brief description of the drawings

[0012] Preferred embodiments of the invention will now be described, by way of example only, with reference to the

drawings, in which:

[0013] Figure 1 is a perspective view from above of the plastics ring;

[0014] Figure 2 is a perspective view from below of the plastics ring;

[0015] Figure 3 is a side section of the plastics ring, through the cut in area 'C';

[0016] Figure 4 is a side section of the plastics ring, through the cut in area 'D';

[0017] Figures 5 is a schematic side view showing the plastics ring and metal lid assembly;

[0018] Figures 6 to 9 are schematic side views showing the application of the lid structure onto a can body; and

[0019] Figure 10 is a schematic side view of the closed container.

Mode(s) for carrying out the invention

[0020] The plastics ring of figure 1 has an annular shoulder 2 and a skirt having an inner wall 3 and an outer wall 4. A tab feature 5 on the outer wall is provided for gripping by a user when opening a container as is described in more detail below. Lug 6 of the example is a fully circumferential lug for engaging a metal lid to form a lid structure and a lower profile 7 on the inner wall for engaging the container body.

Figure 2 is an underneath isometric view of the ring of figure 1, showing cut regions 'A', 'B', 'C' and 'D'. In the side sections of figure 3 and/or 4, the annular shoulder 2, lug 6 and tab 5 can be clearly identified. Lower profile 7 includes teeth 8 in uncut regions which assist in gripping the container body. The cut in the 'C' area is indicated by reference 9 in figure 3 that of the 'D' area by reference 10 which extends from the tab 5 of figure 4.

[0021] Figure 5 shows the lid structure which combines the plastics ring 1 with a metal lid 20. The lid 20 comprises a centre panel 21, inner and outer walls defining a channel 22, the outer wall 23 leading into an outwardly extending annulus 24, and terminating in a raw edge. As can be seen from the figure, the plastics ring is clipped over the annulus 24 so the shoulder 2 covers annulus 24 and lug 6 covers the edge of the lid at 25.

[0022] In figure 6, downward pressure is applied by tool 40 onto the shoulder 2 to force the lid structure downwardly onto a filled container 30. As the lower profile 7 contacts can body curl 31, the ring 1 pivots outwardly and then snaps around the curl into the position of figure 7. In figure 7, the lid structure is fixed to the can body 30, with sealing compound 26 between the annulus 24 of the metal lid and the top of curl 31. The lower profile 7 of the plastics ring has a shape complementary to that of the curl 31 and provides even contact around the curl.

[0023] The next stage of applying the lid structure provides further engagement between the outer wall 23 of channel 22. A downwardly extending portion 41 of the tool 40 has a radially outwardly extending bead 42 which is moved into contact with the outer wall 23 by applying a radial expansion force. Downward pressure is maintained whilst the expansion force is applied to ensure correct positioning of the bead 42 against the outer wall 23. By maintaining downward pressure during expansion, the compression of the compound is maintained during the expansion. This compression is also maintained after the blocking of the lid in the body and partly by the plastic ring.

The combined forces are applied until complementary beads are formed in the lid wall 23 and can body wall 32, beneath the curl 31. The tool 40 is then retracted radially, with downward pressure maintained (figure 9) and tool 40 removed to leave the finished structure of figure 10.

[0024] The invention has been described above by way of example only and changes may be made to the method of forming the lid structure or of applying it to a container body without departing from the scope of the invention as defined by the claims. For example, although the complementary feature 32 has been described as a "bead", clearly this feature could be series of beads, independent lugs or other complementary feature.

Claims

1. A manually removable lid structure comprising:

a metal lid, having a centre panel and a outer wall terminating in a generally outwardly extending annulus; and a plastics ring comprising an inwardly extending annular shoulder and a peripheral skirt depending from the shoulder, the skirt having an inwardly extending lug which clips against the edge of the lid with the shoulder extending over the lid annulus, and a lower profile which is complementary to the profile of the upper edge of a container body to which, in use, the lid structure is to be fixed;

characterised by line of weakening along which at least part of the lower profile of the ring is manually deformable or tearable for opening the container to which the lid structure is attached.

2. A lid structure according to claim 1, in which the centre panel of the lid is joined to the outer wall by a generally U-shaped channel.

3. A lid structure according to claim 1 or claim 2, further including sealing compound around the lid annulus and adjacent the outer wall.

4. A lid structure according to any one of claims 1 to 3, in which the line of weakening defines a tamper evident strip or band.

5. An easy open container comprising:

a metal can body having an open top with an outward curl at the edge of the opening;
the lid structure of claim 1, with the lower profile of the ring engaging the can body curl;

in which the outer wall of the metal lid is seated within the container body and the outer wall and the container body have complementary outwardly extending beads, and
in which, in use, the weakened part is operable manually removing the lid structure from the can body.

6. A method of sealing an easy open container, the method comprising:

placing the lid structure of claim 1 over the open end of a metal container body;
applying downward pressure to force the lid and ring combination down onto the container body so that the lower profile of the plastics ring engages the upper edge of the container body and an outer wall of the lid is adjacent part of the container body side wall; and
maintaining the downward pressure whilst applying a radially outward expansion force to deform the outer wall of the lid and the adjacent body wall into a complementary bead.

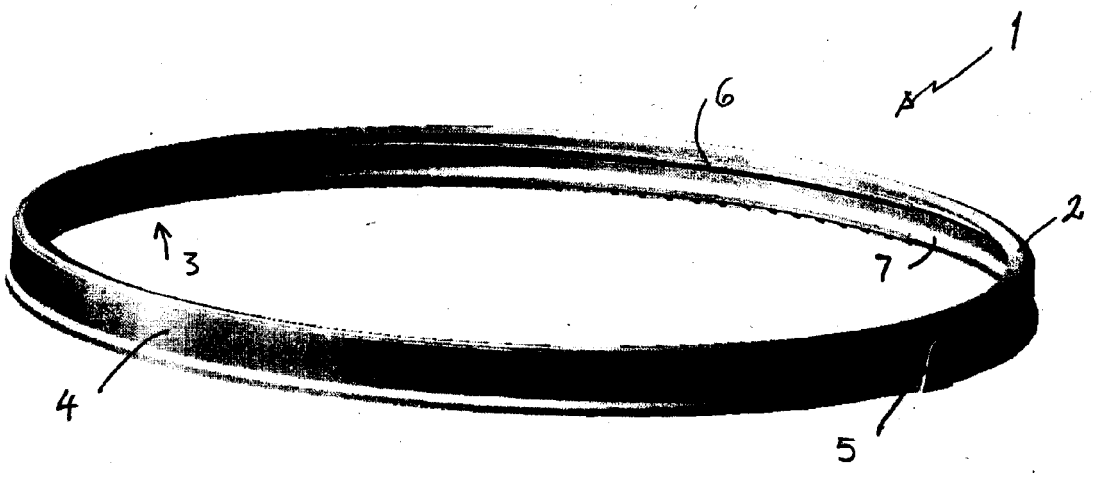

Fig. 1

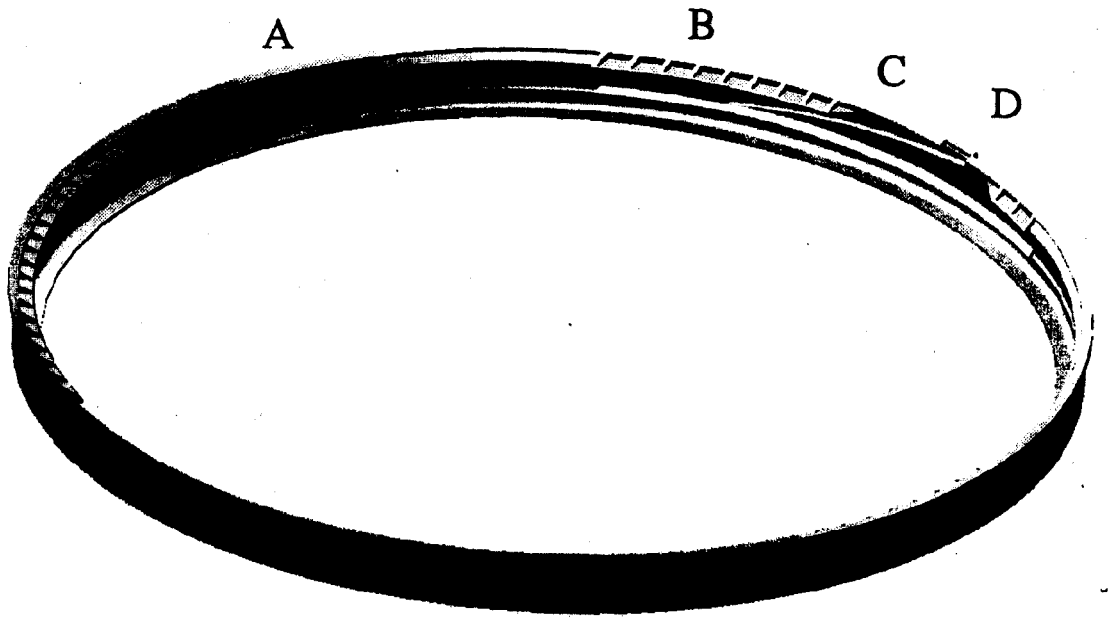

Fig. 2

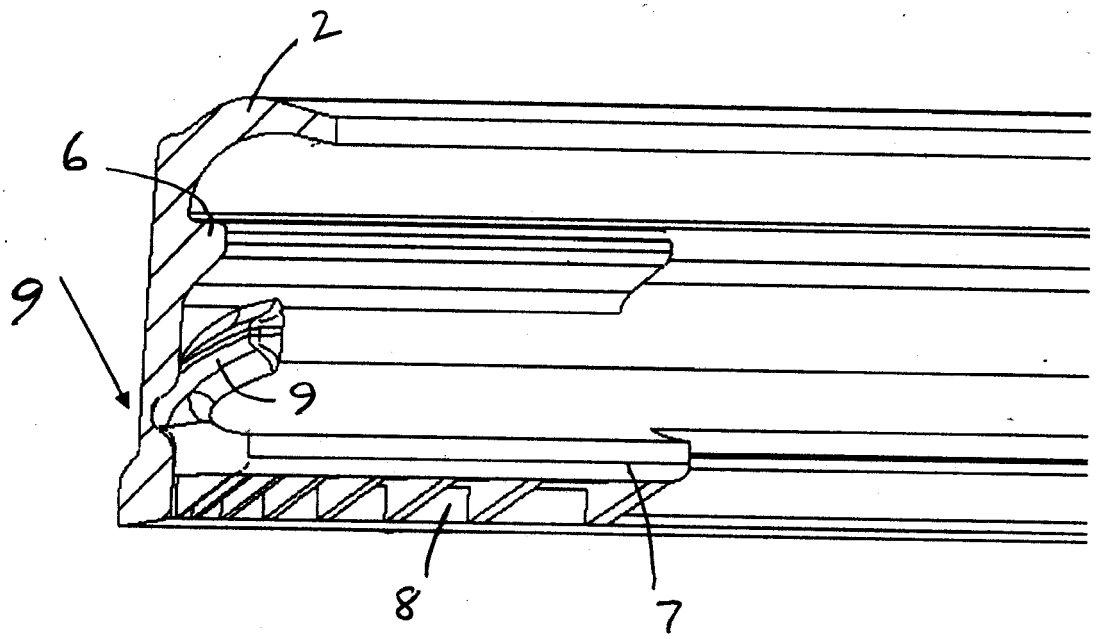

Fig. 3

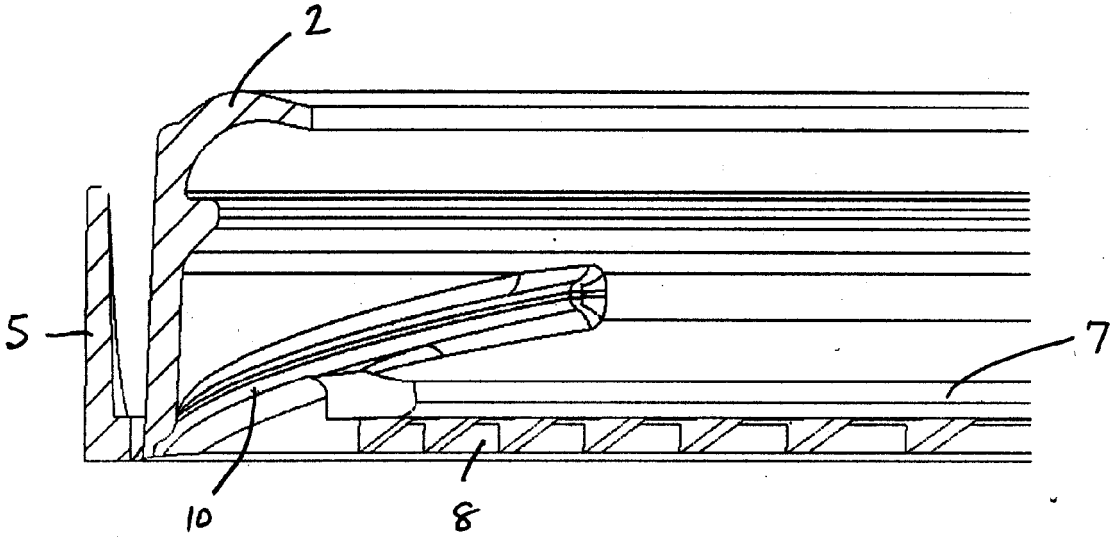

Fig. 4

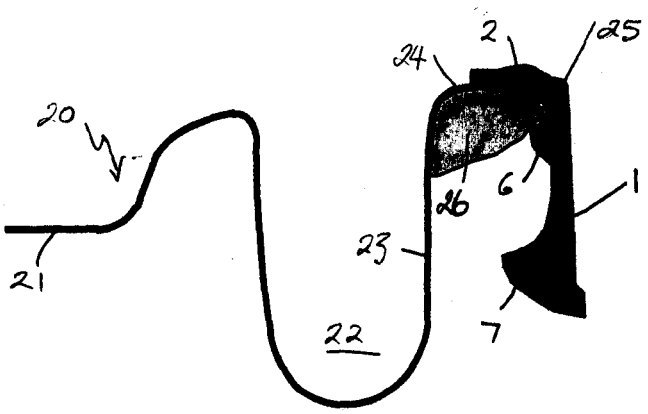

Fig. 5

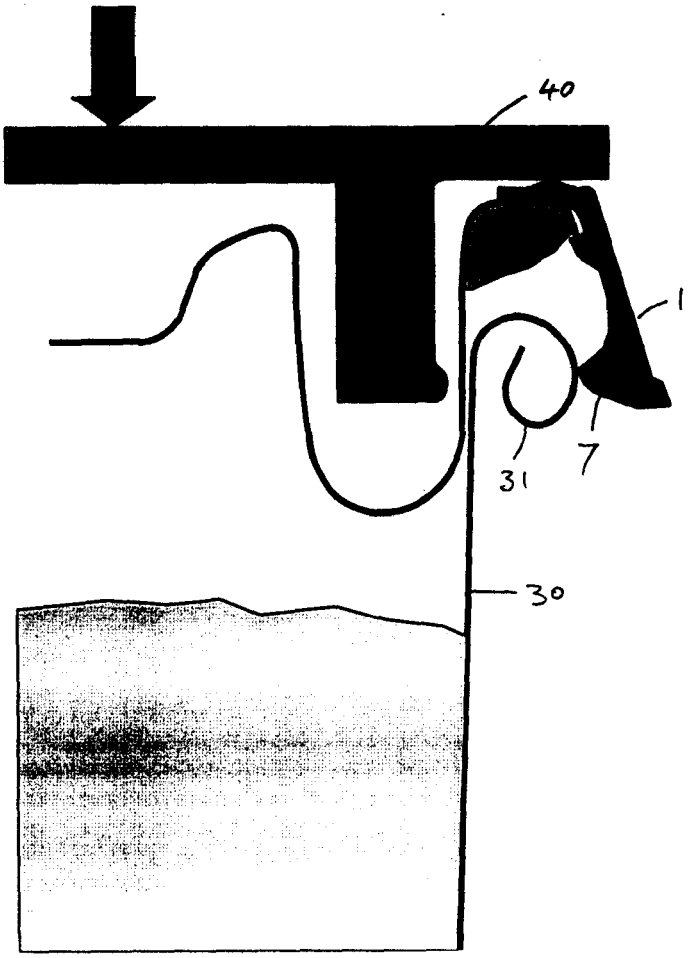

Fig. 6

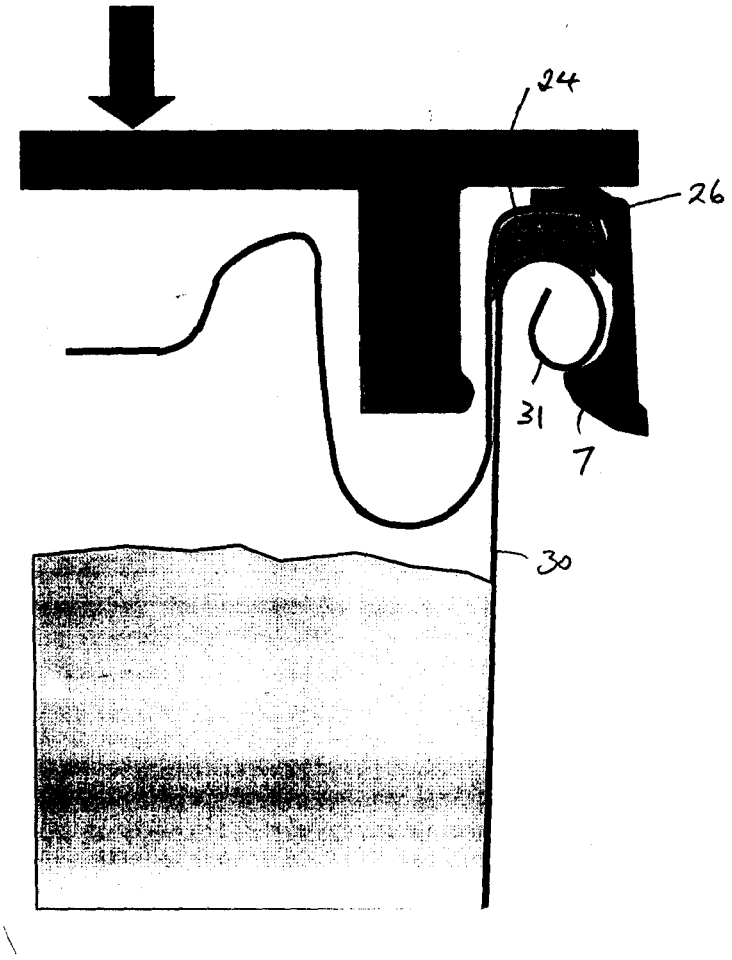

Fig. 7

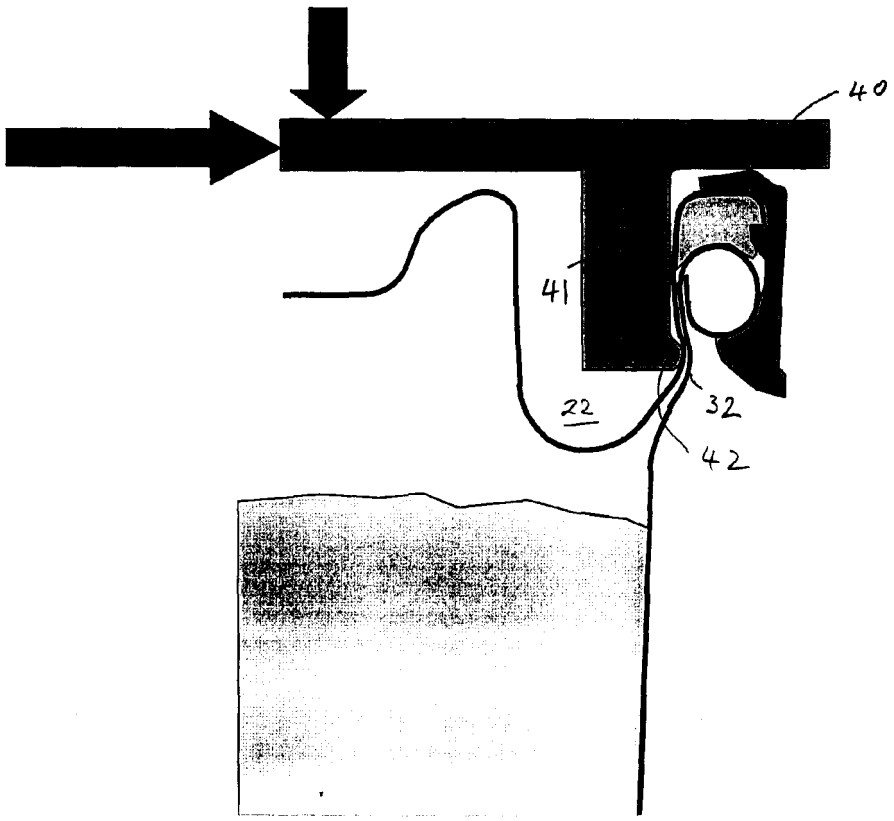

Fig. 8

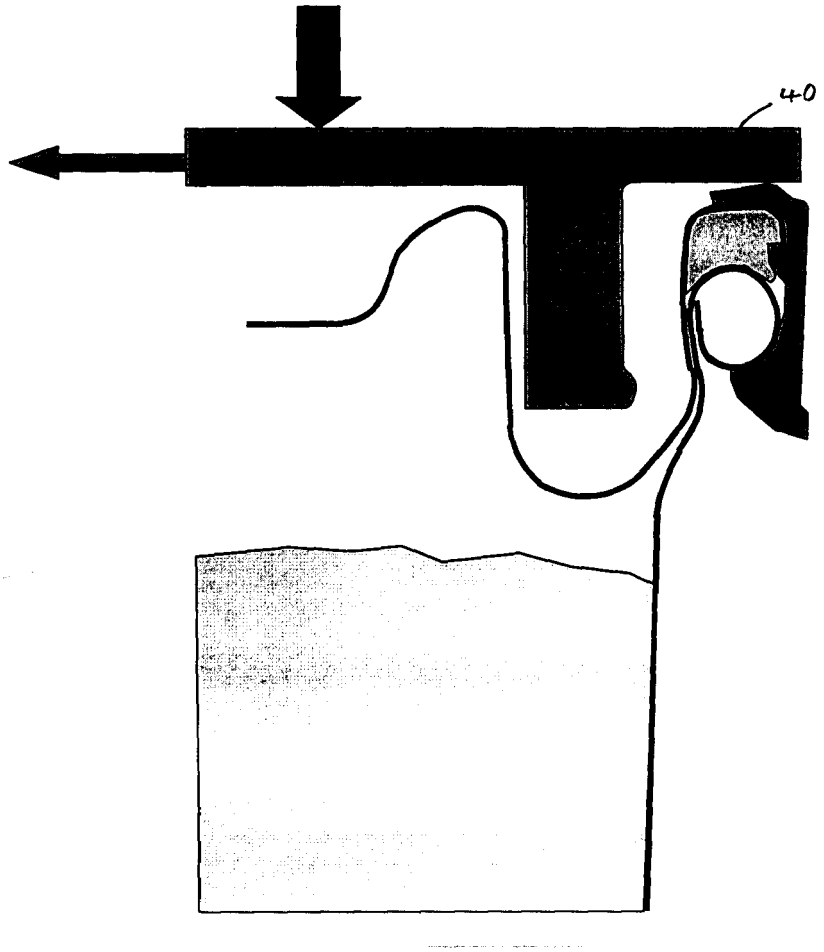

Fig. 9

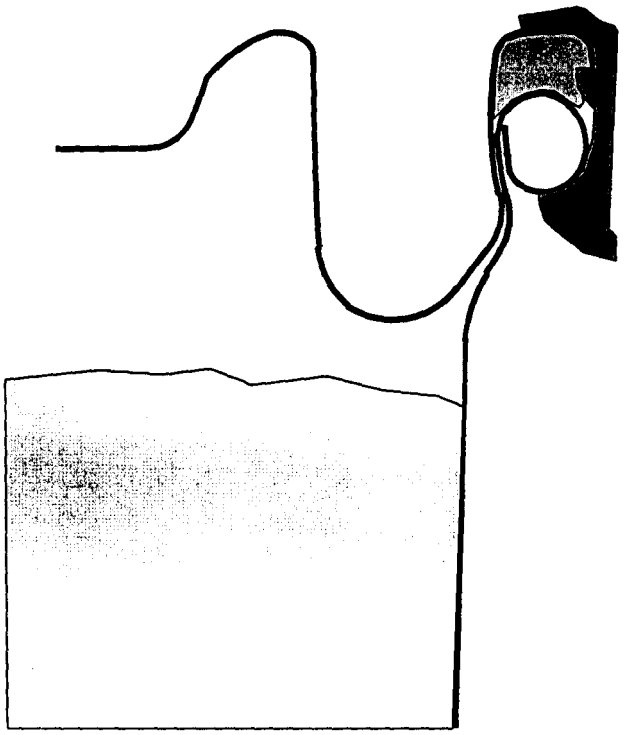

Fig. 10

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 10 1399

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.7)
X	CH 624 356 A5 (BMW-VOGEL AG) 31 July 1981 (1981-07-31)	1-4	B65D43/02
A	* the whole document *	5,6	
A	WO 03/062081 A (GLUD & MARSTRAND A/S; JOERGENSEN, LILIANA, ROMAN; RUPERT, MARIKE, HERM) 31 July 2003 (2003-07-31) * figure 4 *	1	
A	DE 299 20 915 U1 (BLECHWARENFABRIK LIMBURG GMBH) 10 February 2000 (2000-02-10) * figures *	1	
A	US 4 427 128 A (HEYN ET AL) 24 January 1984 (1984-01-24) * figures *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	13 July 2005	Fournier, J

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

3

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 05 10 1399

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-07-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CH 624356 A5	31-07-1981	NONE	
WO 03062081 A	31-07-2003	WO 03062081 A1	31-07-2003
		EP 1467923 A1	20-10-2004
		JP 2005515129 T	26-05-2005
DE 29920915 U1	10-02-2000	NONE	
US 4427128 A	24-01-1984	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82