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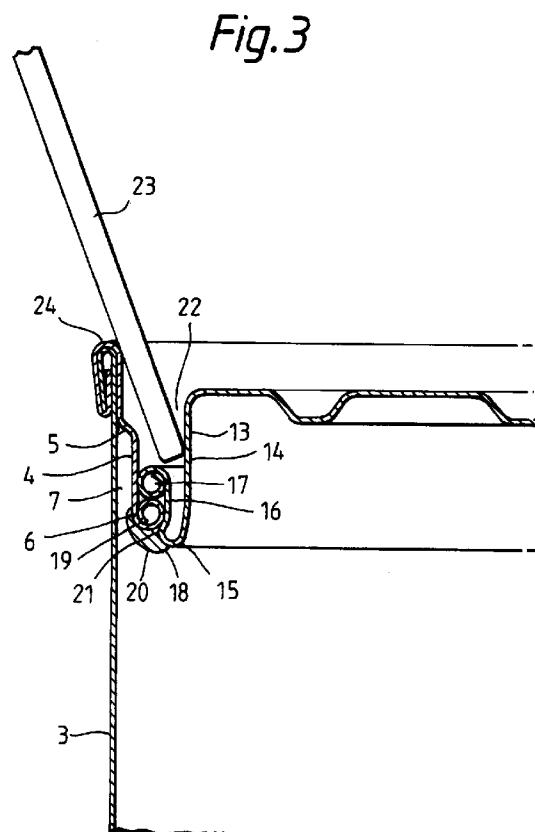
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(54) **Closure for container.**

(57) A lever lid closure for a container, in which the closure comprises a lid (8) located within a ring (4). The lid and ring include outwardly and inwardly facing curls (17, 6) respectively which cooperate to locate the lid within the ring. The ring is spaced inwardly from the side wall of the container to provide abuse resistance, such abuse resistance being enhanced by the cooperating curls. Opening of the container is achieved by inserting a lever (23) into a recess (22) between the ring (4) and an inner wall (14) of the lid (8). The lever pivots about a double seam which joins the ring and container and deforms the inner wall (14) to release the lid from the ring.



This invention relates to closures for containers, and in particular to a type of closure generally known as a lever-lid closure. In these closures a lever, such as a spoon, is used to release the lid from the container. Examples of this type of closure are to be found in WO 92/04247, US 4171063, UK 1536543 and UK 2033880A. It is to this type of closure that the present invention is directed.

Some of the prior art closures detailed above suffer from the disadvantage that rough handling of the container can cause leakage of the contents, or even unwanted removal of the lid. Any dents in the can body can affect the integrity of the lid closure, especially where the lid engages directly with the side wall of the can body. Furthermore, some of the prior art closures require beading in the can side wall to retain the lid. This beading may mean that the design is unsuitable for use with some two-piece cans having relatively thin side walls.

It is an object of the present invention to provide a closure system which reduces or overcomes the above problems.

Accordingly there is provided, in combination, a container having at least one side wall; a ring adapted to be affixed to the container by means of a double seam; and a lid, the lid including a downwardly depending skirt having an inner wall, the lid and ring including locating means cooperating to locate the lid within the ring; and a lever recess into which a lever can be inserted to lever between the ring and the inner wall of the skirt so as to release the lid from the ring; the ring being spaced inwardly from the side wall of the container so as to define a recess therebetween.

The recess acts as a spacer between the locating means and container side wall so that a certain deformation of the side wall is possible without disrupting the locating means.

Preferably, the ring includes the double seam at one end thereof and the locating means at the other end thereof. The use of a ring enables a container with a lever-lid closure to be produced with a double seam which is a particular requirement for two piece cans, for example. Furthermore, the double seam provides a strong pivot point for the lever to act on without distorting at that point.

According to one arrangement, the ring includes a stepped chuck wall adapted to define the recess between the locating means and the side wall of the container. This chuck wall acts as an abuse bead so that it is less likely that any deformation of the side wall would lead to unwanted removal of the lid.

Preferably, the locating means comprises an inwardly facing curl on the ring and an outwardly facing curl on the lid, these two curls cooperating to locate the lid within the ring.

The cooperating curls provide an improved seal with resistance to abuse, particularly due to the

amount of material and area of contact of the locating means. The curls are stiff and thus resist radial force which again assists in maintaining the integrity of the closure.

According to a further aspect of the invention there is provided a lid and ring for a container, the ring including an outer flange adapted to be affixed to a container by means of a double seam, and having an inwardly facing curl; the lid including a centre panel and a downwardly extending skirt comprising an inner wall, a turned portion and an outwardly facing curl; the arrangement being such that the inward and outwardly facing curls cooperate to locate the lid within the ring in a releasable manner, the lid and ring defining therebetween a lever recess in which a lever can be inserted to lever between the ring and the inner wall of the skirt to release the lid from the ring.

Preferably the inwardly facing curl on the ring is at the distal end of the ring from the outer flange and the outwardly facing curl on the lid is at the distal end of the skirt. The inward and outwardly facing curls conveniently lie adjacent one to another when the lid is located within the ring. According to one arrangement the skirt is provided with a projection such that the projection and the outwardly facing curl form together a depression in which the inwardly facing curl can be received. Preferably the projection is formed by crimping the turned portion of the skirt.

The outwardly facing curl preferably lies below the level of the centre panel, and conveniently lies below the portion of the inner wall which is adapted to be contacted by a lever. This arrangement allows access for the lever to be able to remove the lid from the container, whilst maintaining the aperture size of the container. By levering on a portion of the lid panel, such as the inner wall of the skirt, there is therefore no need to be able to obtain access under the outwardly facing curl, as in many prior art designs of lid closure. To facilitate the levering of the lid the inner wall of the downwardly extending skirt is preferably substantially vertical.

The inner wall of the skirt is usually distorted on opening the container, thus providing evidence of tampering if any attempt is made to open the closure. Furthermore, the inner wall is weak in comparison with the double seam, about which a lever will pivot, so that the distortion is controlled and limited to the inner wall.

To improve the integrity of the lid closure there may conveniently be provided a line of sealing compound between the inwardly facing curl and the skirt. Preferably the lid and ring are formed from a single blank of material.

The invention will now be further described, by way of example only, with reference to the accompanying drawings, in which:-

Fig.1 is a schematic sectional view of a lidded container according to the invention;

Fig.2 is a plan view of the container of Fig.1;  
Fig.3 is an enlarged view of a portion of the container of Fig.1, showing how the lid is attached to the container; and

Figs. 4 - 8 are schematic sectional views showing the sequence of manufacture of the lid and ring of Fig.1.

Referring to Figs. 1 - 3, a container shown generally at 1 comprises a base 2 and an integral side wall 3. Attached to the top of the side wall by means of a conventional double seam is a ring 4 comprising a stepped chuck wall 5 and terminating in an inwardly facing curl 6. The stepped chuck wall 5 defines a recess 7 between the curl 6 and the container side wall 3.

The lid of the container is shown generally at 8 and comprises a centre panel 9, and inner and outer raised annuli 10 and 11 separated by a bead 12. Depending vertically from the outer annulus 12 is a skirt 13 comprising an inner wall 14, a turned portion 15, an upstanding portion 16 and terminating in an outwardly facing curl 17. The turned portion is provided with a crimp 18 to define a depression 19 between the crimp and the outwardly facing curl 17. The depression 19 is dimensioned to receive the inwardly facing curl 6 of the ring 4. A line of sealing compound 20 is applied to the region 21 between the inwardly facing curl 6 and the turned portion 15 of the skirt 13.

The ring 4 and inner wall 14 define therebetween a lever recess 22, into which is inserted a lever such as a spoon shown generally at 23. The spoon can be used to lever against the inner wall 14 of the skirt 13 using a region 24 at the top of the ring 4 near the double seam as a fulcrum. The double seam acts as a strong fulcrum whereas the inner wall 14 is relatively weak, thus 5 controlling the deformation. The inward movement of the inner wall 14 flexes the skirt 13 allowing the crimp 18 to pass over the inwardly facing curl 6, thus permitting removal of lid 8.

The lid can subsequently be reattached to the container by pressing back into position, with the inwardly facing curl 6 once again being received in the recess 19 between the crimp 18 and the outwardly facing curl 17. This will act as a cover preventing the ingress of dust etc into the container and limiting any odours from escaping therefrom, but as the integrity of the sealing compound 20 has been destroyed, the reclosed lid may not act as a hermetic seal. Furthermore, the inner wall 14 can be weak enough to ensure that deformation on tampering or opening is permanent, giving evidence of entry.

The manufacture of lid 8 and ring 4 will now be described with reference to figures 4 - 8. Firstly a blank of material is drawn into the shape shown in Fig.4. The drawn blank is then formed into two portions by making an annular cut as shown at 25. The upper part is then formed into the ring 4 by making the inwardly facing curl 6. The other end of the ring 4

has already been provided with a flange 26, generally known as a cover hook, for forming into a double seam with the container side wall. The finished ring is shown in Fig.5.

The remaining part of the blank is provided with the outwardly facing curl 17, and is then reformed, pushing the centre panel etc. of the lid through the level of the curl 17 to form the inner wall 14, turned portion 15 and upstanding portion 16. The reformed lid is shown in Fig.6.

The ring of Fig. 5 and lid of Fig.6 are then assembled, and the crimp 18 is then applied, to further retain the curl 6 against the upstanding portion 16 as shown in Fig.7. Finally a line of sealing compound 20 is applied to produce the finished ring and lid as shown in Fig.8.

It will be seen from the above that the ring and lid can therefore be produced from a single stamping, and although the blank is slightly greater in area than that of a conventional scored full aperture easy open end, the conventional easy open end requires a considerably thicker gauge material. Further advantages over such scored easy open ends include the absence of any dangerous cut edges, a generally increased aperture size, and the ease of opening associated with a spoon leverable lid, as opposed to the force required to open a scored lid. Furthermore, the recess 7 allows for a considerable denting of the side wall of the can without affecting the integrity of the closure.

The lid and ring described above are typically formed of metal such as tinplate, tin free steel, or aluminium, although metal/polymer laminates may also be employed. The container body may be relatively short, such as in a food tray, relatively tall such as in a can, and may similarly be formed of a metal or metal/polymer laminate, or alternatively of plastics material or paperboard. Although the above embodiments have been described with respect to circular containers, it will be appreciated that non-circular shapes such as rectangles, squares or quartics may be accommodated.

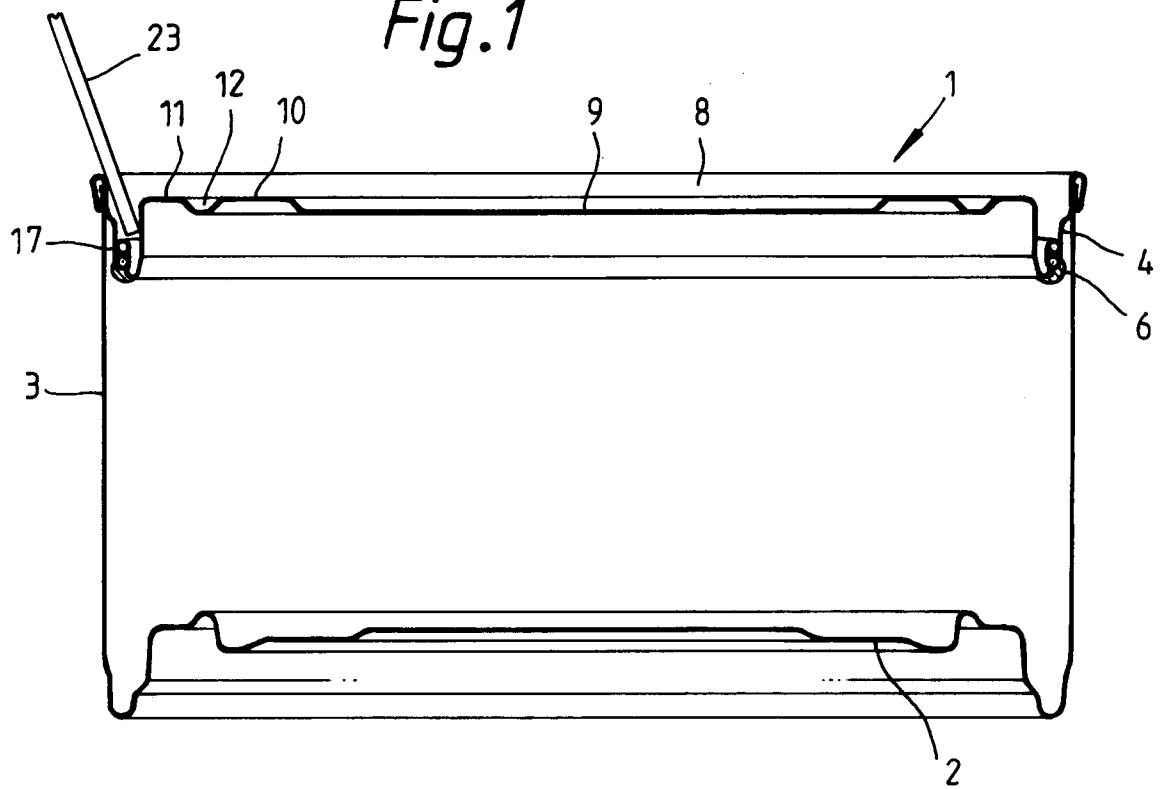
## Claims

1. In combination, a container (1) having at least one side wall (3); a ring (4) adapted to be affixed to the container by means of a double seam; and a lid (8), the lid including a downwardly depending skirt (13) having an inner wall (14), the lid and ring including locating means (6, 17) cooperating to locate the lid within the ring; and a lever recess (22) into which a lever (23) can be inserted to lever between the ring and the inner wall of the skirt so as to release the lid from the ring; the ring (4) being spaced inwardly from the side wall (3) of the container so as to define a recess (7) there-

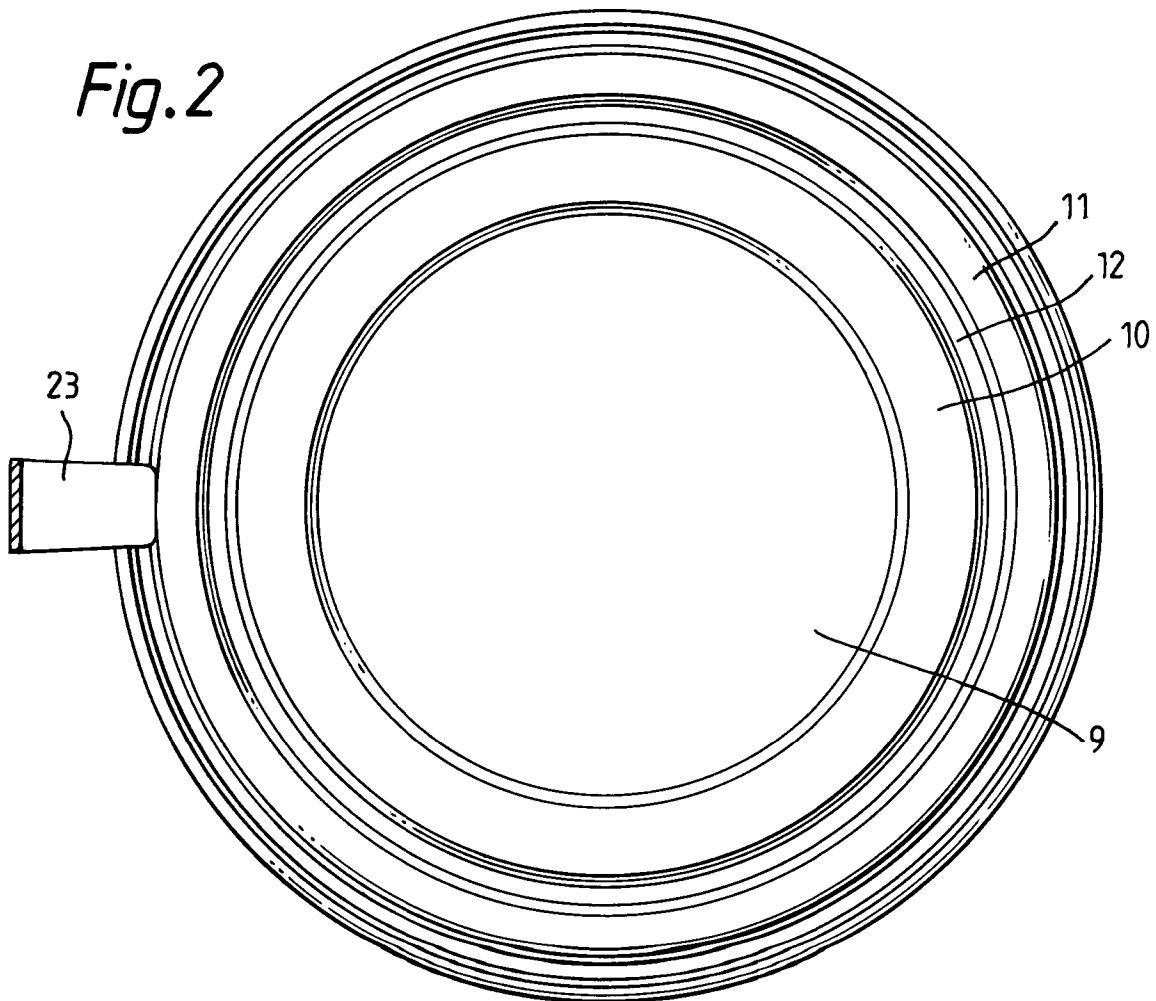
between.

2. A combination according to claim 1, wherein the ring (4) includes the double seam at one end thereof and the locating means (16) at its other end. 5
3. A combination according to claim 2, wherein the ring (4) includes a stepped chuck wall (5) adapted to define the recess (7) between the ring and the side wall of the container. 10
4. A combination according to any of claims 1 to 3, wherein the locating means comprises an inwardly facing curl (6) on the ring, and an outwardly facing curl (17) on the lid, the said two curls co-operating to locate the lid within the ring. 15
5. A lid and ring for a container, the ring (4) including an outer flange adapted to be affixed to a container by means of a double seam, and having an inwardly facing curl (6); the lid (8) including a centre panel (9) and a downwardly extending skirt (13) comprising an inner wall (14), a turned portion (15) and an outwardly facing curl (17); the arrangement being such that the inward and outwardly facing curls cooperate to locate the lid within the ring in a releasable manner, the lid and ring defining therebetween a lever recess (22) into which a lever (23) can be inserted to lever between the ring and the inner wall of the skirt to release the lid from the ring. 20  
25  
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6. A lid and ring according to claim 5, wherein the inwardly facing curl on the ring is at the distal end of the ring from the outer flange and the outwardly facing curl on the lid is at the distal end of the skirt. 35
7. A lid and ring according to claim 5 or claim 6, wherein the skirt is provided with a projection such that the projection and the outwardly facing curl form together a depression (19) in which the inwardly facing curl can be received. 40  
45
8. A lid and ring according to any of claims 5 to 7, wherein the outwardly facing curl lies below the level of the centre panel.
9. A lid and ring according to claim 8, wherein the outwardly facing curl lies below the portion of the inner wall which is adapted to be contacted by a lever. 50
10. A lid and ring according to any of claims 5 to 9, wherein the inner wall of the downwardly extending skirt is substantially vertical. 55

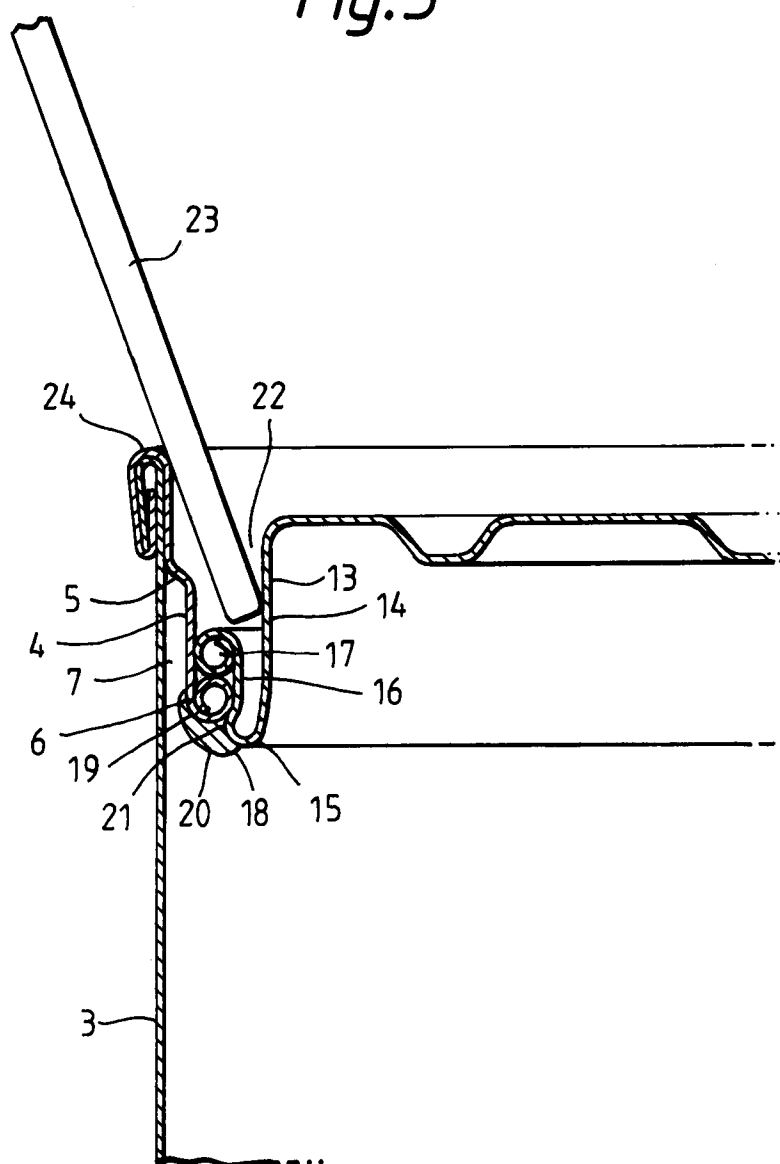
*Fig.1*



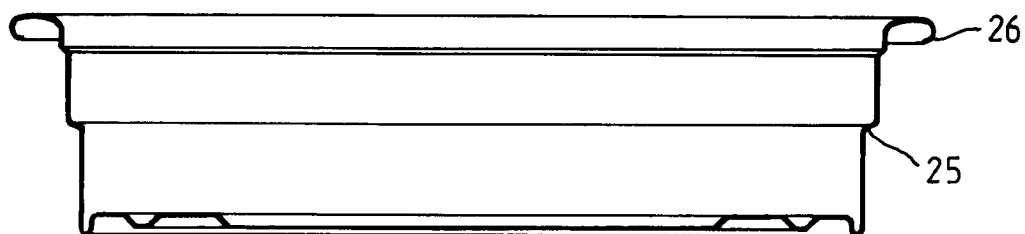
*Fig.2*



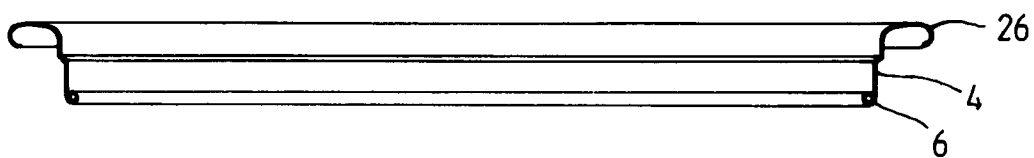
*Fig. 3*



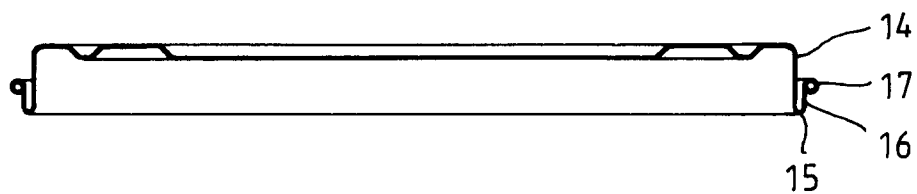
*Fig. 4*



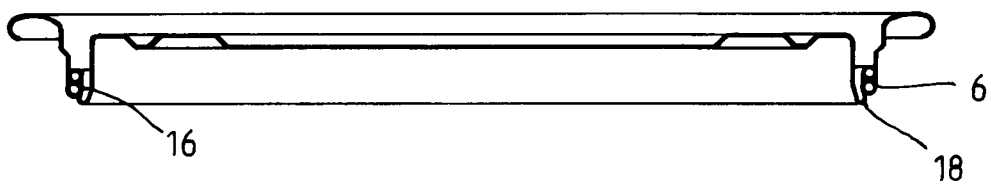
*Fig. 5*



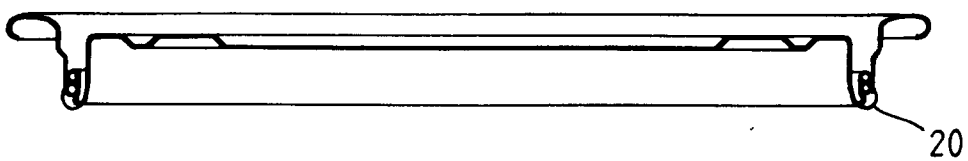
*Fig. 6*



*Fig. 7*



*Fig. 8*





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# EUROPEAN SEARCH REPORT

Application Number  
EP 93 30 9214

| 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,D<br>Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | WO-A-92 04247 (SCHORMAIR)<br>* page 10, line 9 - line 24 *<br>* page 13, line 23 - page 14, line 13;<br>figures 7,8 *<br>---    | 1-3<br>4-10                                          | B65D43/04<br>B21D51/38                       |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US-A-3 105 621 (FRANCIS)<br>* figures 1-5 *<br>---                                                                              | 1,2                                                  |                                              |
| Y<br>A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | US-A-4 087 018 (TEBBUT)<br>* column 2, line 34 - line 54 *<br>* column 3, line 24 - line 30; claim 1;<br>figures 3,7 *<br>---   | 4-10<br>1-3                                          |                                              |
| A,D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | US-A-4 090 004 (TEBBUT)<br>* column 2, line 23 - column 3, line 9;<br>figures 1-8 *<br>& GB-A-1 536 543 (METAL BOX LTD.)<br>--- | 1-10                                                 |                                              |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | DE-U-86 21 177 (K.HUBER VERPACKUNGSWERKE)<br>* page 11, line 12 - line 32; figure 2 *<br>---                                    | 1-10                                                 |                                              |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | FR-A-917 708 (ETAB. J.-J.CARNAUD)<br>* figures 1-6 *<br>---                                                                     | 1                                                    |                                              |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | GB-A-832 383 (METAL BOX CO.LTD.)<br>* figures 1-4 *<br>---                                                                      | 1,5                                                  |                                              |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EP-A-0 024 093 (TANIUCHI)<br>-----                                                                                              |                                                      |                                              |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                 |                                                      |                                              |
| Place of search<br>THE HAGUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                 | Date of completion of the search<br>23 February 1994 | Examiner<br>Berrington, N                    |
| <p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>-----<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                                 |                                                      |                                              |

EPO FORM 1503 (12.82) (P04C01)