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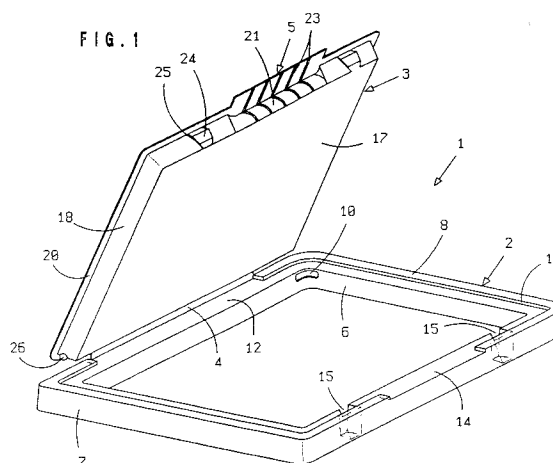
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(54) **Opening-closing device comprising a lid hinged to a frame designed to engage the rim of a container.**

(57) An opening-closing device with a lid (1) is obtained by thermoforming from thermoformable sheet material and comprises a relatively rigid perimeter frame or framework (2) bounding an internal space and designed to engage the rim of a container body, a lid (3) which can be seated removably in the space within the frame (2) and which is linked integrally thereto by means of at least one flexible portion (4) acting as a hinge, means (18, 26, 10) for retaining the lid in the closed position and an operating grip (5) for the lid (3) placed on the side opposite the hinge (4).



This invention relates to an opening-closing device with a lid for containers in general and in particular for containers thermoformed from plastics material.

In the manufacture of containers which are thermoformed from thermoformable sheet material the production of hollow container bodies such as trays, bowls, beakers, cups, etc., and lids for application to and removal from a container body, as well as containers with lids, or container bodies attached to a corresponding incorporated lid by means of one or more hinge strips which may be weakened along predetermined lines of bending are known.

The production of containers with lids by thermoforming sheet or strip material implies that the lid should necessarily have the same thickness as the body of the corresponding container. For many applications this is undesirable given that relatively small thicknesses may be sufficient for the lids, while it is desirable to have a container body of greater thickness, on account of requirements for robustness, structural stability and aesthetics, e.g. to avoid bulging. Obviously if a sheet of thicker thermoplastic material is used this objective can be achieved in any case, but with a considerable wastage of thermoformable material.

The main object of this invention is to provide an opening-closing device with a lid obtained by the thermoforming of thermoformable material, which can be applied to a container body for loose products, in general both before and after the container body has been filled.

Another object of this invention is that the said opening-closing device with a lid of thermoformable material may be applied either to containers of plastics material or containers of other materials.

A further object of this invention is that the said opening-closing device should be suitable for acting as an advertising vehicle for the contents of promotional gift articles.

Not the last object of this invention is that the opening-closing device with a lid according to the invention should be relatively simple and easy to manufacture, be highly reliable and have a limited cost.

These and other objects which will be more apparent below are accomplished through an opening-closing device with a lid obtained by thermoforming which comprises a relatively rigid perimeter frame or framework which is designed to engage the rim of a container body, a lid which can be located removably in the space within the frame or framework and which is firmly anchored thereto by means of at least one flexible portion acting as a hinge, means for retaining the lid in a closed position and a grip for operating the lid located on the opposite side from the hinge.

Advantageously the lid is configured as a shallow tray in order to act as an advertising vehicle and in order to contain promotional gift objects, which can be

assembled onto the container body after it has been loaded or filled with the loose product.

The invention is further described below with reference to the appended drawings, in which:

Figure 1 is a perspective view of a thermoformed opening-closing device with a lid according to the invention in a partly open position,

Figures 2 and 3 are lateral views of the opening-closing device in Figure 1 for two different positions of the lid,

Figure 4 shows a plan view of the opening-closing device in Figures 1 to 3 in an open position,

Figure 5 is a view in lateral elevation of Figure 4, Figures 6 to 11 show cross-sectional views taken along the lines VI-VI, VII-VII, VIII-VIII, IX-IX, X-X and XI-XI respectively in Figure 4,

Figure 12 shows a plan view of an opening and closing device with a lid sealed and capable of acting as an advertising vehicle with four pencils contained therein and held together by a film of transparent material,

Figures 13 and 14 are seen in cross-sections taken along the lines XIII-XIII and XIV-XIV respectively in Figure 12.

Figure 15 illustrates a view from above of a closed opening-closing device fitted to a container body of thermoformed material,

Figure 16 is a view from below of the container with the opening-closing device in Figure 15,

Figure 17 is a view in cross-section along the line XVII-XVII in Figure 15, but with the lid in the completely open position,

Figure 18 shows a view along the line XVIII-XVIII in Figure 15 on a magnified scale and in cross-section,

Figure 19 is a view in cross-section along the line XIX-XIX in Figure 16,

Figures 20 and 21 show views along the lines XX-XX and XXI-XXI in Figure 16 on a magnified scale and in cross-section respectively, and

Figures 22 and 23 show lateral views in elevation and plan view respectively of a variant of the opening-closing device with a lid according to the invention.

In the appended drawings identical or similar parts or components have been identified using the same reference numbers.

With reference to the figures listed above, an opening-closing device with a lid 1 is obtained by thermoforming from thermoformable sheet material, e.g. polypropylene, polyethylene and the like, and comprises a relatively rigid perimeter frame or framework 2, a lid 3 which can be seated removably on frame or framework 2 and which is integrally combined therewith by means of a flexible portion 4 acting as a hinge, and an grip 5 for operating the lid, located opposite hinge 4.

Perimeter frame or framework 2 is constructed

with a double wall, an inner wall 6 and an outer wall 7, which are joined together by a covering or top section 8 so as to form an uninterrupted annular groove or recess 9 (Figure 8) which opens downwards. Inner wall 6 has a number of transverse recesses 10 spaced about the framework, e.g. four located at the corners in the case of a rectangular frame or framework with linked corners such as those in Figures 1 to 21. Top section 8 instead has a peripheral rebate 12 which extends all the way round the framework and faces the interior thereof.

In the area where hinge 4 is attached, e.g. along most of the long rear side in the case of a frame 2 of rectangular configuration, rebate 11 has a wider portion 12 which includes all the top section 8 and also extends at 13 over almost the full height of outer wall 7 (Figures 4 and 6), while along the long front side rebate 11 extends forward in an area 14 designed to contact and receive part of operating grip 5. A recess 15 is provided at the two ends of front rebate area 14, and this extends in the direction of the thickness or height of frame or framework 2 and preferably has two opposite lateral walls 16 which are flared upwards and undercut.

Lid 3 is formed of a substantially flat wall 17 which has a configuration and overall dimensions slightly less than the space bounded by inner wall 6 of frame or framework 2. Wall 17 has a projecting perimeter edge 18, which rises from wall 17 with a small recess, bounds an outer cavity 19 and ends in a peripheral flange 20.

Along the length of the edge adjacent to frame or framework 2 flange 20 forms a single body with hinge 4, while it has a substantially uniform thickness equal to the height of rebate 11 in frame 2 over its entire extent, so that in the closed position it is flush and coplanar with top section 8 of the frame. Along the front, opposite that linked to hinge 4, lid 3 has a grip 5, which is formed partly from an outward and inward widening 21 of flange 20 and partly from a length 22 of edge 18 which is inclined so as to enter cavity 19 in order to delimit together with widened flange 21 an undercut section which is accessible from outer cavity 19 so that it can be grasped by the tips of the fingers.

Advantageously, impressions, e.g. bound by transverse ribs 23, can be provided to help the fingers grip the undercut portion of the grip.

Grip 5 is flanked by two projections 24 projecting from edge 18, which are slightly tapered in the direction from flange 20 towards wall 17 and have sides 25 undercut into a dovetail to engage slidably, removably and firmly a corresponding recess 15 in frame or framework 2. Recesses 15 act as both holding and guide members for projections 24 and are capable of ensuring a stable lock between the two even under severe operating conditions, e.g. when the container is subjected to lateral and/or vertical compression forces which deform it to some extent.

At its posterior corners adjacent to hinge 4, peripheral edge 18 has a projection or boss 26, which is designed to contact and mate with a corresponding adjacent recess 10 in frame or framework 2 in order to position the lid correctly in the closed position and hold it firmly (Figure 14).

The opening and closing device with a lid 1 described above can be fitted to the perimeter of a container body, e.g. a tray 27, which is also produced by thermoforming, or a container of any other suitable material, such as metal, wood, plastics, glass and the like, which has the same configuration in plan and has an edge or rim 28 which can be inserted into annular groove 9.

To this end container 27 may have a rim 28 comprising an inner side 29, an outer side 30 and a transverse top surface 31 dimensioned in such a way as to mate accurately with inside wall 6 and outside wall 7 and the top section 8 of frame or framework 2 respectively (Figures 15 to 21). At corner recesses 10 in the frame, rim 28 has corresponding re-entrants to make a snap connection with the outer surface of a corresponding recess so as to permanently and automatically clip the frame on container 27 without the need for welding, gluing, riveting or any other (certainly more costly) means of attachment between frame 2 and container 7.

Advantageously, container 27 has a peripheral projecting shoulder 32 below rim 28 which serves to compensate for the thickness of inner wall 6 of the frame, which may abut against it, so that the inside face of wall 6 of the frame forms a continuation of the inner wall of container 27 when in use, without any interruptions or discontinuities, so as not to provide an obstacle to removal of the contents.

As may be seen from Figures 4, 6 and 17, hinge 4 is a little shorter than the long side of frame 2 and lid 3 and has two longitudinal lines of weakness, one 34 adjacent to outer wall 7 of frame 2 and the other 35 in an intermediate position far from line 34 of a length equal to the width of outer wall 7, so as to allow a marginal section 36 which forms a widening of flange 20 to bend and support rebated area 14. Also hinge 4 allows the lid to open fully, even by more than 180 degrees. In fact lid 3 can be tilted back and kept open by gravity as a result of its own weight, which is extremely advantageous for loading, filling or emptying the container without obstruction (Figure 17).

Figure 12 shows how an opening and closing device with a lid 1 according to this invention can also be used as a promotional or advertising vehicle, e.g. by prepacking an inserted gift, e.g. pencils 40, which can be held in position e.g. using a conventional film of transparent heat welded material. It will be noted that this pre-packaging may be performed separately, and, preferably, before device 1 is fitted to a container 27, which in this case should be prefilled with product. Thus the pre-packaging of device 1 does not

interfere with either fitting the lid onto container 27 or with filling the latter.

An opening and closing device with a lid 1 as described above is perfectly flat at the top along wall 8 of the frame when in the closed position as flange 20 of lid 3 is seated in rebate 11.

Figures 22 and 23 illustrate one example of an embodiment in which device 1 has a circular perimeter instead of a polygonal perimeter for application to a cylindrical or frustoconical container 27.

It will be noted that in order to open lid 3 all that is necessary is to place the tips of the fingers alongside ribs 23 in the undercut portion and gently lift widened flange 21 of the grip from beneath using the thumb, pressing with the fingers against the undercut wall in order to raise it.

The opening and closing device with a lid described above is susceptible of many improvements and variants within the scope of the protection defined by the contents of the following claims.

Thus for example frame or framework 2 may also lack outer wall 7.

In addition to this, lid 3 may be sealed to frame or framework 2 by welding with heat welded film thus avoiding the need to wrap the whole comprising container body 7 and opening-closing device 1 with heat welded and heat-shrinking film (for a secure seal).

As will be seen, the opening and closing device with a lid described above fulfils all the objects specified above and can be fitted simply and quickly to many types of containers without the need to perform complicated fixing operations. It also provides an almost hermetical seal, with the result that it is also indicated for products which must preserve their aroma over a period of time, or products which contain volatile components.

Claims

1. An opening-closing device with a lid obtained by thermoforming, which comprises a relatively rigid perimeter frame or framework bounding an internal space and designed to engage the rim of a container body, a lid which can be seated removably in the space within the frame and which is linked integrally thereto by means of at least one flexible portion acting as a hinge, means for retaining the lid in the closed position and an operating grip for the lid placed on the side opposite the hinge.
2. A device according to claim 1, characterised in that the said perimeter frame has the structure of a double wall bounding an uninterrupted annular groove or recess designed to receive the upper edge of a container body.

3. A device according to claim 2, characterised in that the said frame has a plurality of recesses or projections on its inner wall which are transverse to its inner wall and which are spaced along the frame and designed to make a snap connection to corresponding projections or seats provided along the edge of the container body.
4. A device according to claims 2 or 3, characterised in that the said groove or recess is bounded by two inner and outer side walls, and a top wall, which has a rebate on its outer face which extends along the entire length of the frame and faces the interior thereof.
5. A device according to any one of claims 1 to 4, characterised in that the said grip is located on the opposite side with respect to the hinge.
6. A device according to claim 5, characterised in that the recess has a widening in the vicinity of the hinge and the operating grip which affects the full width of the top wall.
7. A device according to any one of claims 4 to 6, characterised in that the said recess also extends over the outer wall of the frame in the vicinity of the hinge.
8. A device according to any one of the foregoing claims, characterised in that the said lid is formed of a panel or wall having a configuration and overall dimensions which are slightly smaller than the space within the frame and which has a slightly recessed projecting perimeter edge which together with the panel bounds an outer cavity and ends in a peripheral flange.
9. A device according to claim 8, characterised in that the flange is connected to the said hinge or forms a single body therewith along the part thereof adjacent to the said frame.
10. A device according to claim 9, characterised in that the said flange has a uniform thickness substantially equal to the height of the rebate in the frame, so that when the lid is in the closed position it is flush and coplanar with the said top wall of the frame.
11. A device according to claims 9 or 10, characterised in that the said operating grip is constructed partly by a both outward and inward widening of the said flange and partly by a length of the said edge of the lid which is inclined so as to be recessed towards the outer cavity in such a way as to create an undercut area together with the widened flange which is accessible from the outer

cavity so that it can be engaged by the tips of the fingers.

12. A device according to claim 11, characterised in that the said grip is provided with impressions providing a better purchase for the fingers. 5

13. A device according to any one of the foregoing claims, characterised in that the said means for retention in a closed position also comprise a recess provided from the part of the inner space within the said frame in a section away from and opposite the hinge and extending in the direction of the thickness or height of the frame and provided with two opposing recessed and undercut side walls, and one or a corresponding projection projecting from the said projecting edge of the lid and configured so as to taper slightly from the flange towards the wall or panel of the lid, with undercut sides so as to engage slidably and removably nest in a corresponding recess in the frame. 10
15
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14. A device according to claim 13, characterised in that the said retaining means comprise at least one projection or recess in the said edge of the cover in an area adjacent to the hinge in order to mate with a corresponding recess or projection provided in the inner side of the frame for more correct positioning and stable retention of the lid in the closed position. 25
30

15. A device according to any one of the foregoing claims, characterised in that the said flexible hinge portion comprises a strip-like portion constructed in a single piece with the outer wall of the said frame and the flange of the lid and has two parallel lines of weakness, one against the outer wall of the frame and the other at a distance therefrom substantially equal to the height of the frame. 35
40

16. A container when fitted with an opening and closing device with a lid according to any one of the foregoing claims. 45

17. A container according to claim 16, characterised in that it has a rim capable of being seated in the said groove of the frame and having recesses or projections for forming a snap connection thereto. 50

18. A container according to claim 17, characterised in that it has a peripheral shoulder adjacent to the edge on which the frame is seated, so as to provide a smooth inner wall without any breaks in continuity between the container and the frame. 55

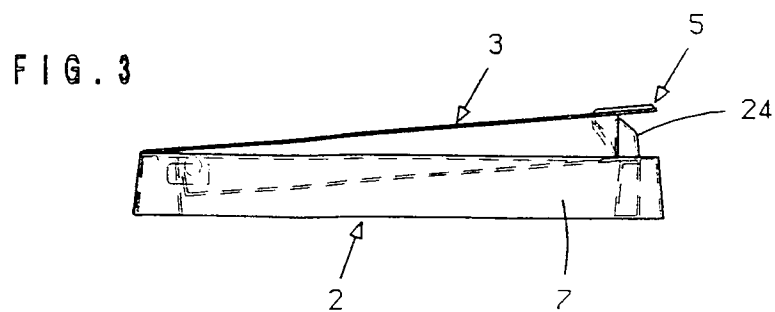
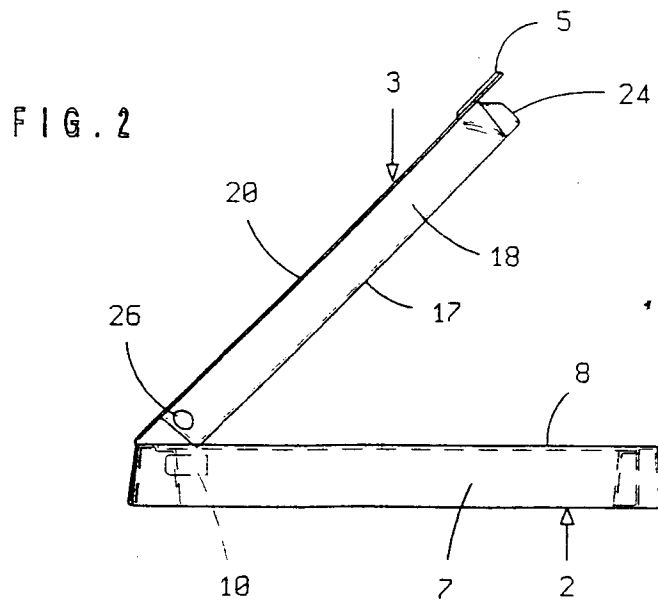
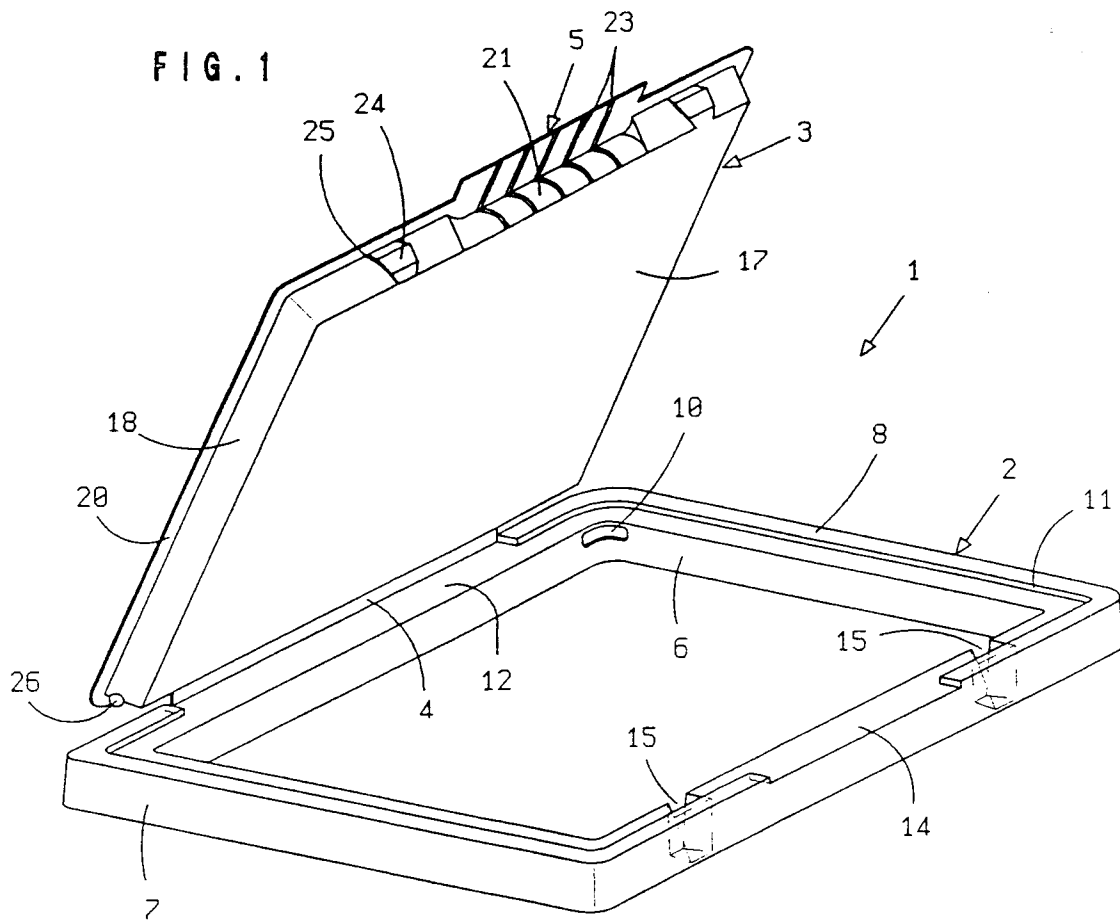


FIG. 5

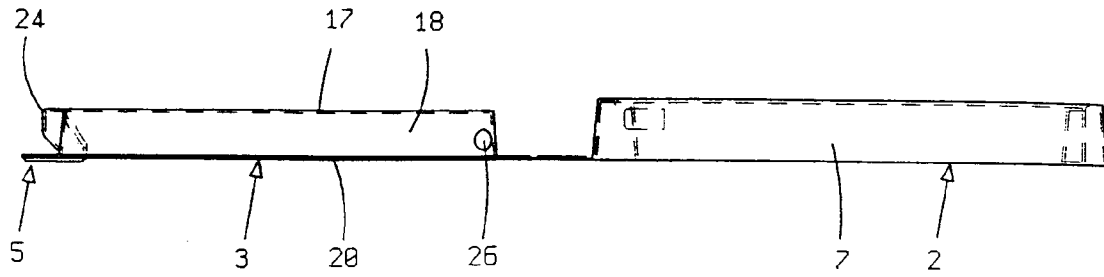


FIG. 4

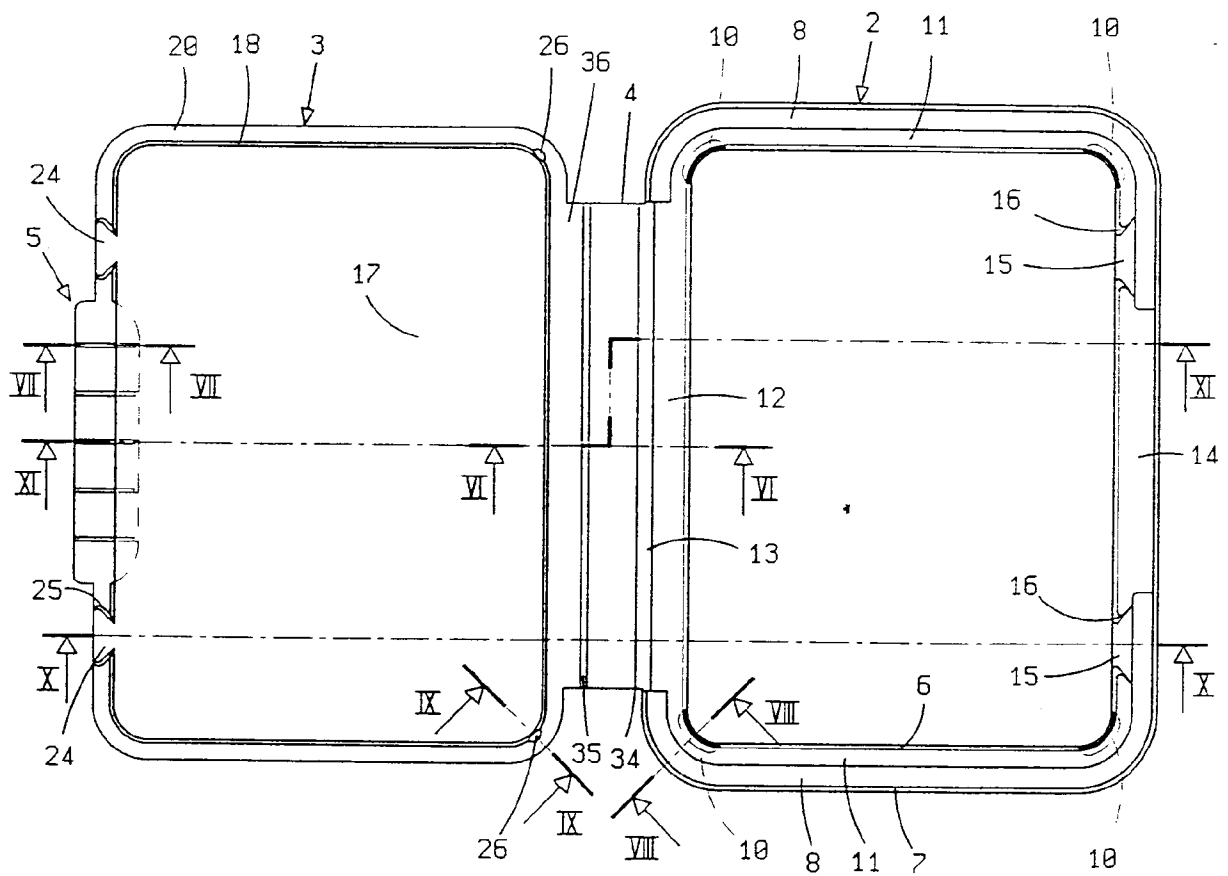


FIG. 6

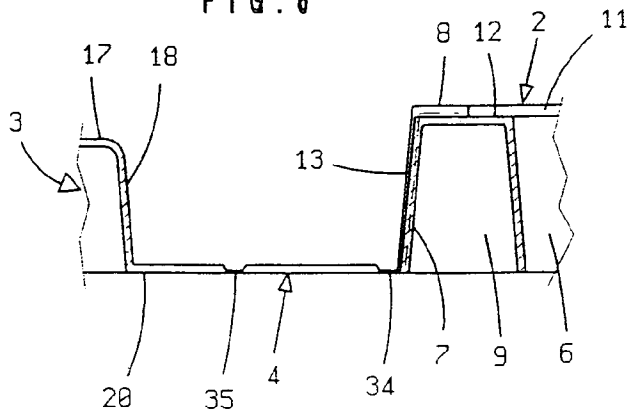


FIG. 7

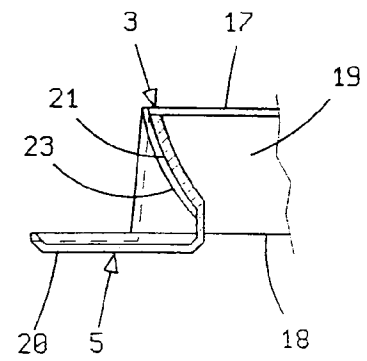


FIG. 8

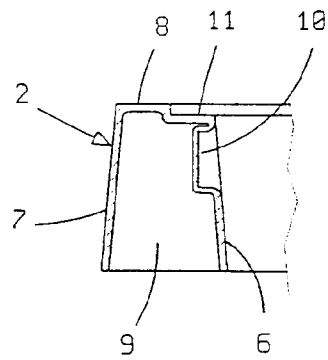


FIG. 9

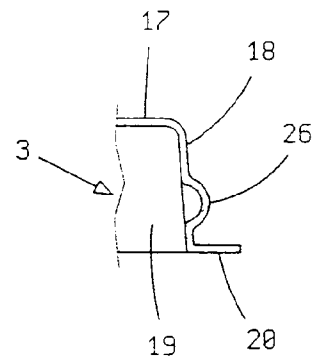


FIG. 10

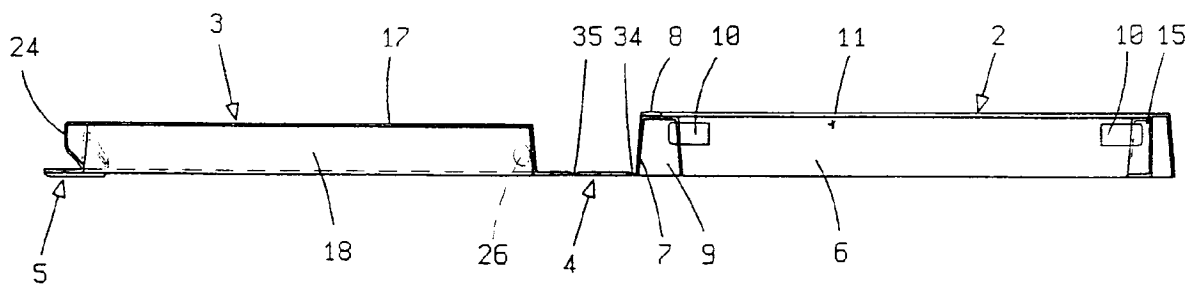


FIG. 11

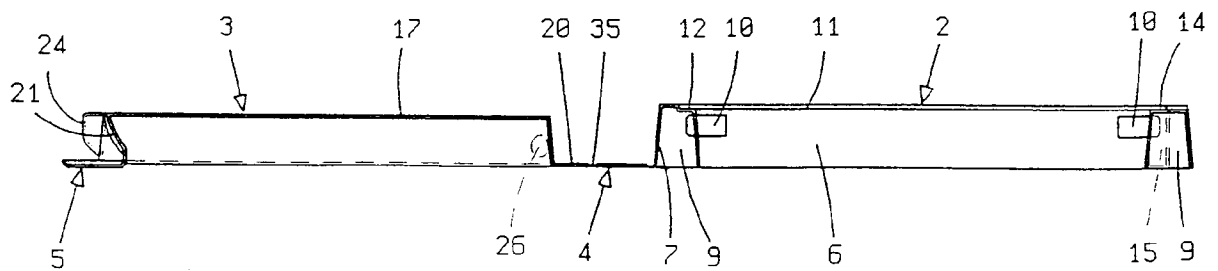


FIG. 14

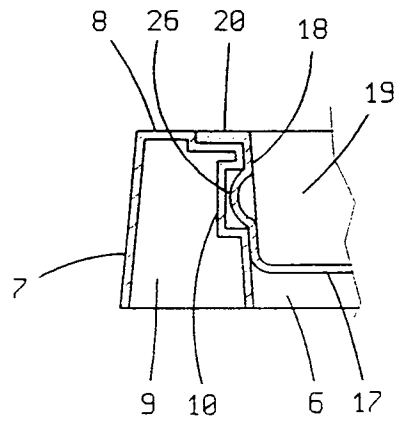


FIG. 13

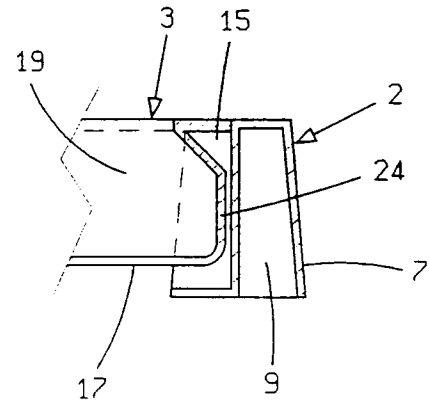


FIG. 12

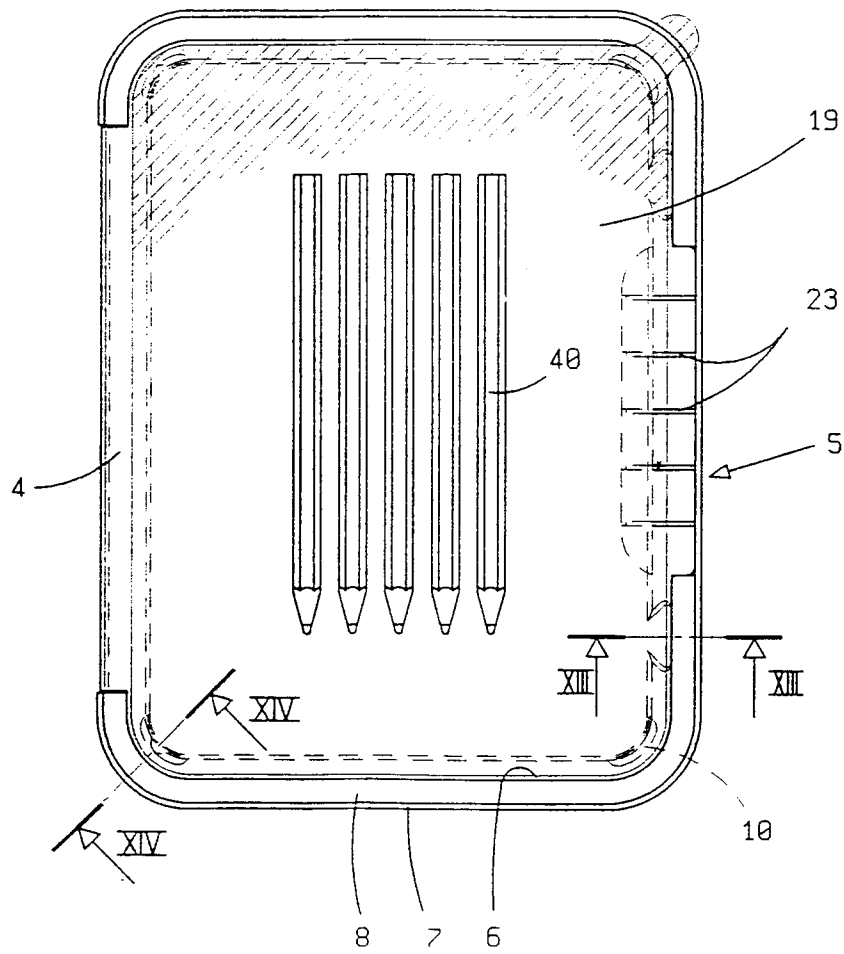


FIG. 17

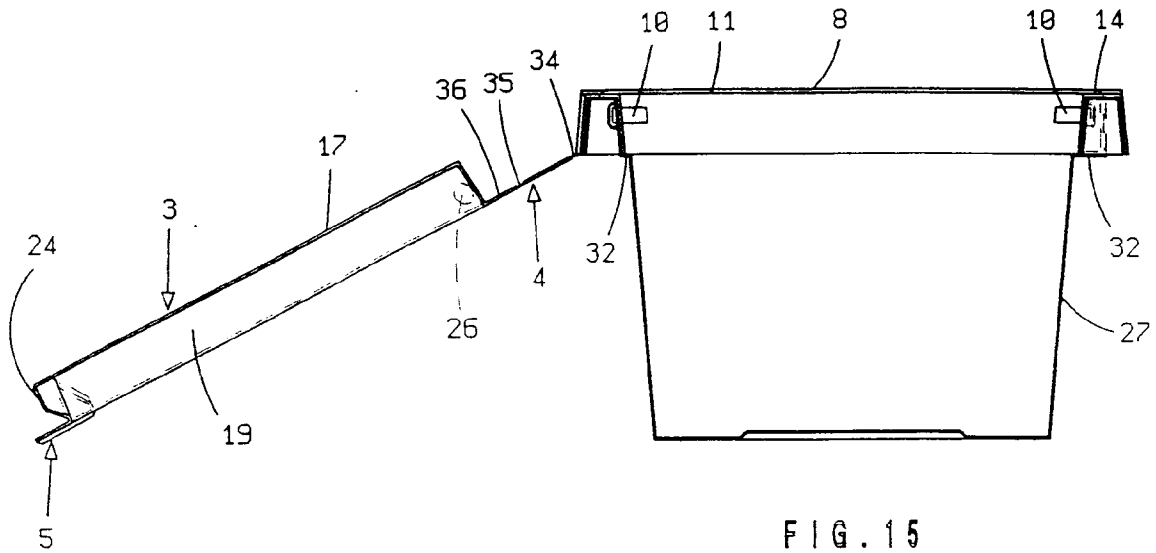


FIG. 15

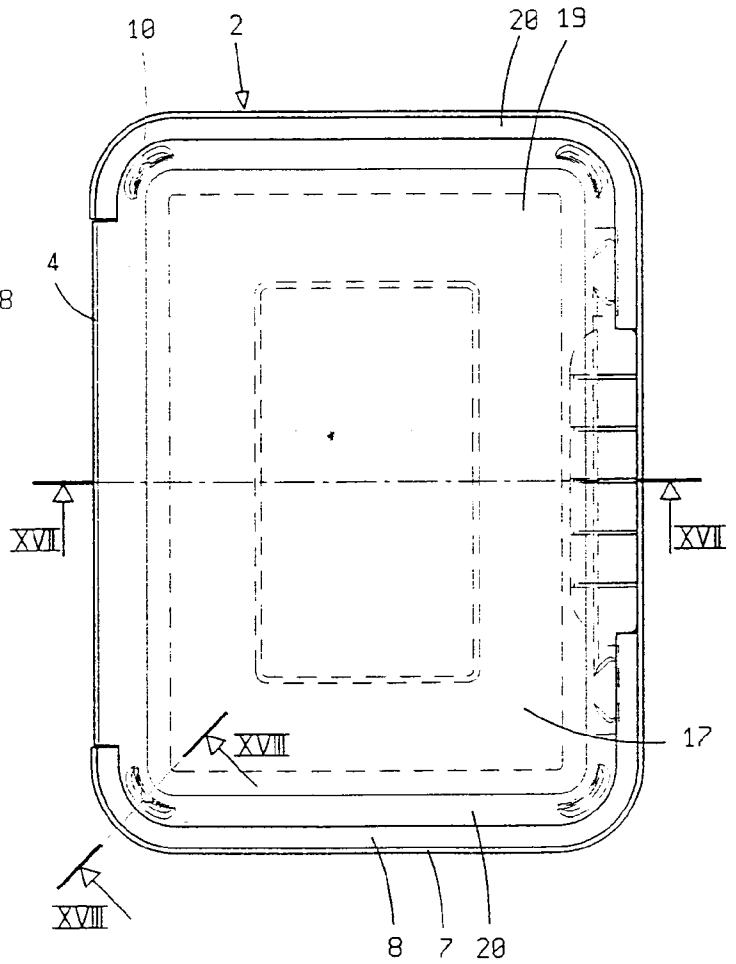


FIG. 18

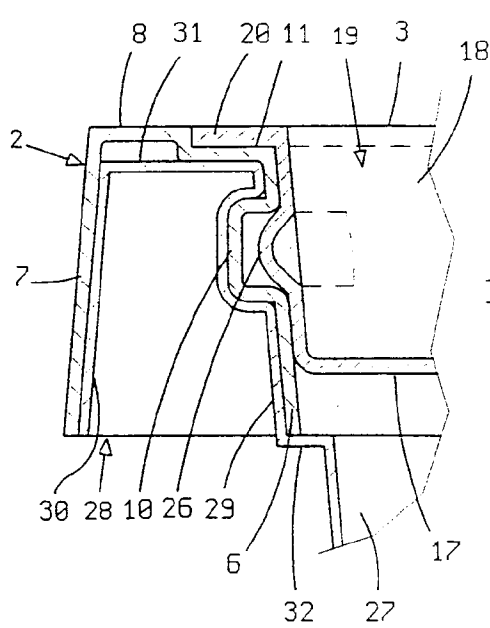


FIG. 19

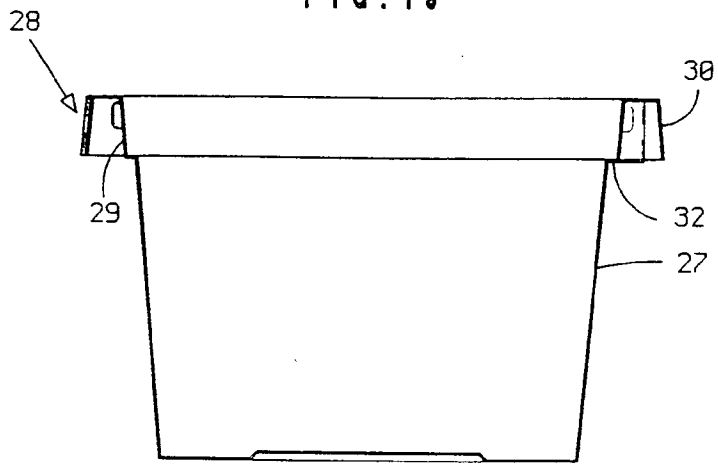


FIG. 20

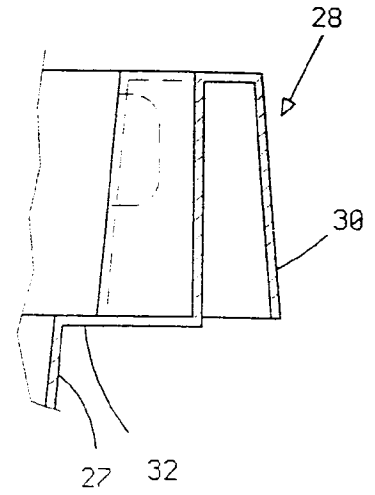


FIG. 16

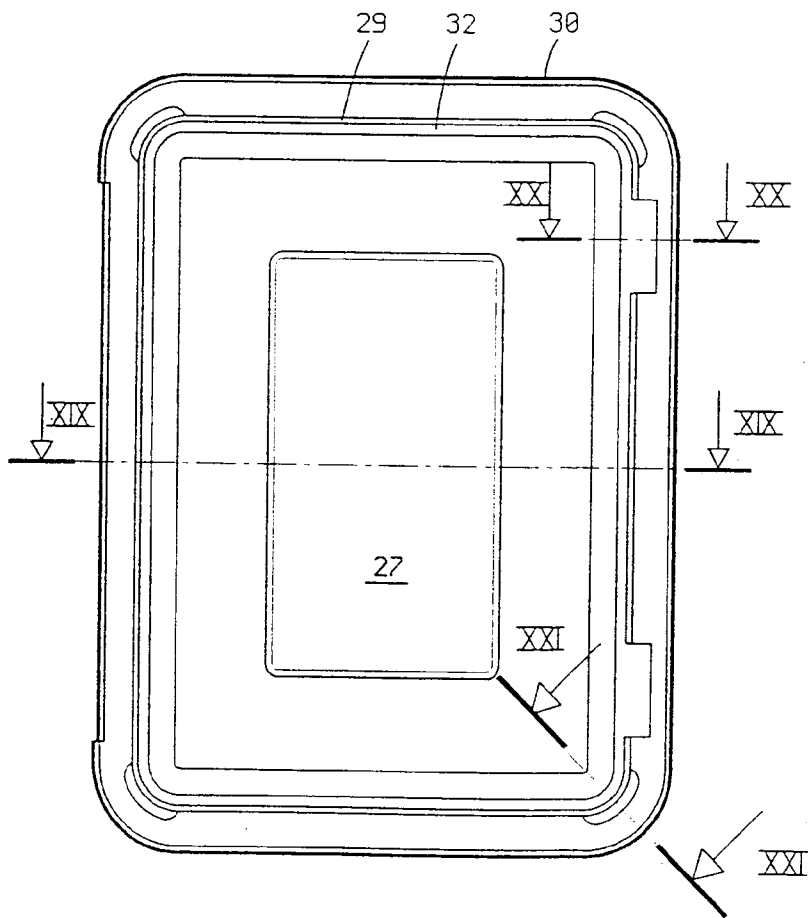


FIG. 21

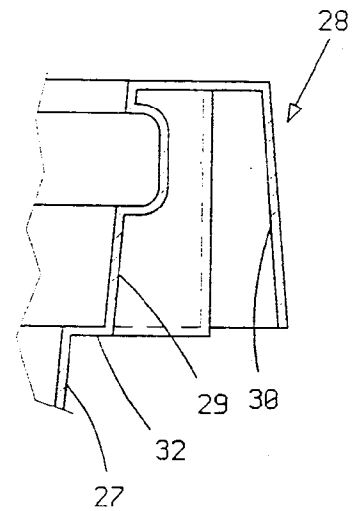


FIG. 22

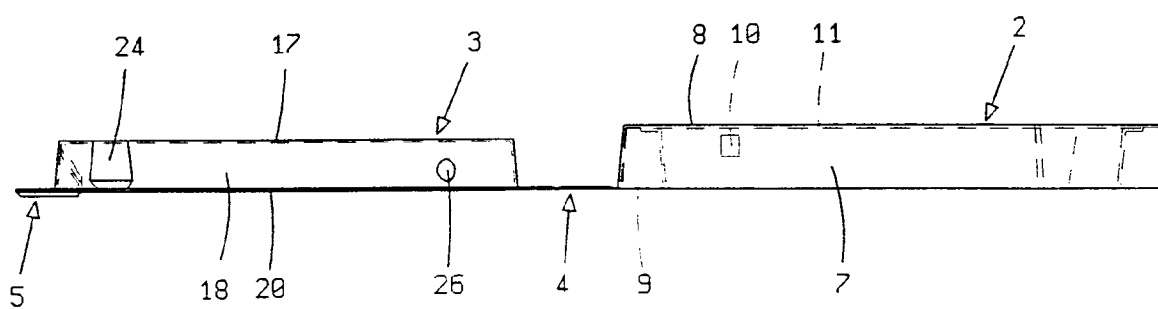
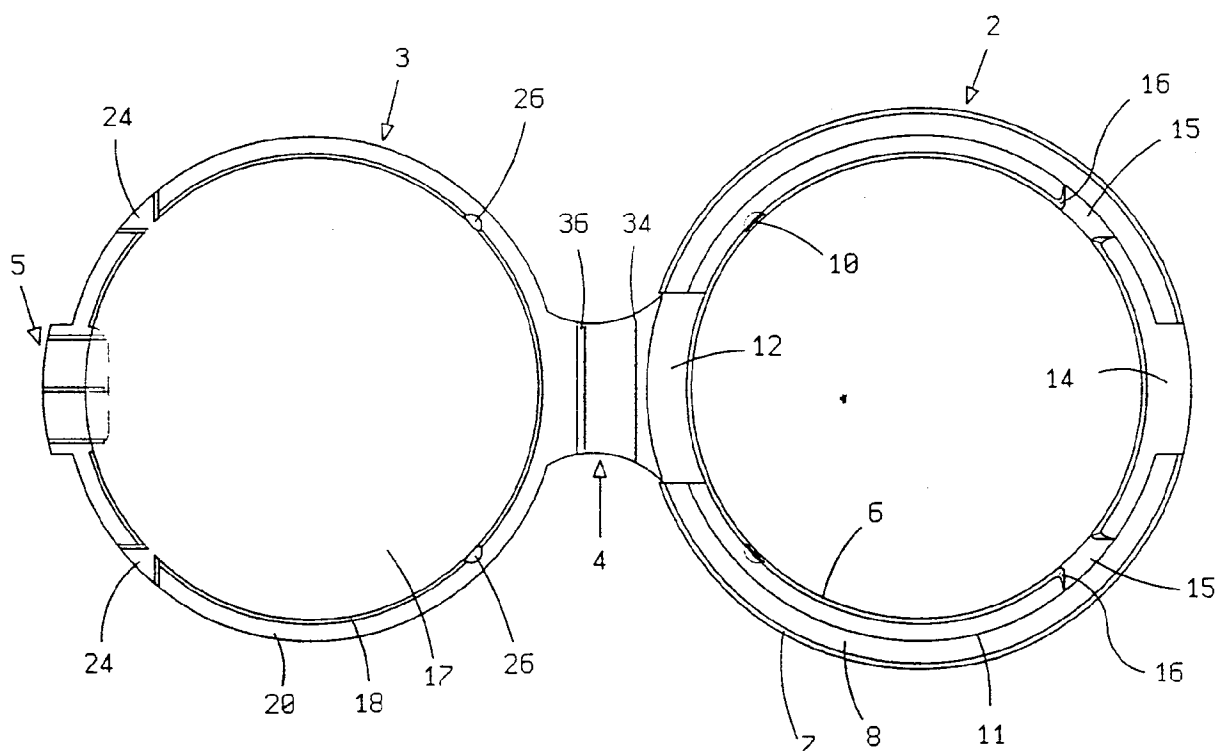


FIG. 23





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 9042

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.6)
X	EP-A-0 072 294 (JUILLET)	1,2,5,8,9,15,16	B65D43/16
A	* page 4, line 15 - page 5, line 31; figures 1-5 *	3,4,10,11,18	

X	WO-A-93 17920 (CHRISTENSSON)	1-3,5,8,9,16,17	
A	* page 4, line 20 - page 6, line 9; figures 1-7 *	4,14,15,18	

X	EP-A-0 370 982 (CHRISTENSSON)	1-6,8,9,16,17	B65D
A	* column 3, line 32 - column 4, line 13; figures 1,2 *	7,10,11,13,18	

X	DE-A-40 06 518 (SCHIMANSKI)	1,2,4,5,7-10,16	
A	* column 3, line 66 - column 5, line 40; figures 1-6 *	3,6,11-15,17,18	

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search		Date of completion of the search	Examiner
THE HAGUE		27 March 1995	Vantomme, M
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			

EPO FORM 1503 (03.92) (P04C01)