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(71) Applicant: **VIKING INDUSTRIES LIMITED**
3 Kelso Crescent
Moorebank, N.S.W. 2170 (AU)

(72) Inventor: **Eriksen, Jorgen Bonde**
8, Vestbirkvej, Gammelstrup
DK-8740 Braedstrup (DK)

(74) Representative: **Jensen, Peter Kim et al**
c/o Chas. Hude H.C. Andersens Boulevard 33
DK-1553 Copenhagen V (DK)

(54) **Child proof lid for a container.**

(57) A child proof lid for a container comprising a lid frame (1) adapted to be firmly mounted on the container and a lid disc (26) detachably and supportedly mounted in the lid frame (1), said lid disc having substantially parallel and opposing lateral edges (27, 28) and opposite end portions (33, 34) extending under projecting portions (17, 21) of the frame (1). The projecting portions (17,21) of the frame (1) are firm and a stop means is provided to prevent the displacement of the lid disc (26) in relation to the lid frame (1) in the plane of the lid disc. The lid disc (26) is elastically bendable and supported by protrusions (7, 8) projecting under the parallel lateral edges (27, 18) of the lid disc (26) at a distance from the end portions (33, 34) of the lid disc. A cavity (36) is provided in the lid frame (1) under the end portions (33, 34) of the lid disc (33, 34), said cavity at least at one end portion (34) extending a distance beyond the end portion at least corresponding to the distance which the opposite end portion (33) extends under the superjacent projecting frame portion (17).

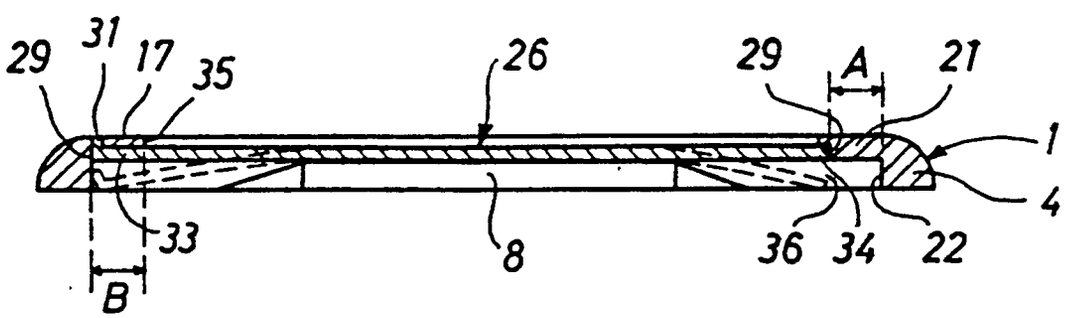

Fig.6

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CHILD PROOF LID FOR A CONTAINER

The invention relates to a child proof lid for a container, said lid comprising a lid frame, firmly mountable on the container and a detachable and supported lid disc mounted in the lid frame, said lid disc having two substantially parallel and opposing lateral edges and opposite end portions extending under projecting portions of the frame.

German Offenlegungsschrift No. 36 43 603 discloses a lid frame of the above type in which the lid disc is supported by a circumferential abutment surface extending from the inner periphery of the lid frame. One of the projecting portions comprises a hinged tongue, said tongue having a downwards facing knob which engages an opening in the lid disc. When the hinged tongue is turned upwards so as to disengage the knob from the opening in the lid disc, the lid disc, having been displaced in its plane, can be removed from the frame. Persons with weak fingers, e.g. caused by arthritis, may find it difficult to turn the hinged tongue upwards and thereby to remove the lid disc.

The object of the invention is to provide a lid of the above type which is inexpensive to manufacture, is mountable on a container without necessitating changes in the normal production line of the container and which can be opened without problems also by people with weak fingers.

The lid according to the invention is characterised in that the projecting portions of the frame are firm, that there is provided a stop means to prevent displacement of the lid disc in relation to the lid frame in the plane of the disc, that the lid disc is elastically bendable and supported by a protrusion projecting under the parallel lateral edges of the lid disc at a distance from the end portions of the lid disc and that there is a cavity in the lid frame under the end portions of the lid disc, said cavity at least at the one end portion extending a distance beyond the end portion corresponding to at least the distance the opposite end portion extends under the superjacent frame portion. In order to remove the lid disc from the lid frame, the lid disc must be pressed downwards close to at least one of its end portions, thereby attaining a curvature whereby the stop means is rendered ineffective. Subsequently, while still being pressed downwards and being curved said lid disc is slid into the cavity extending beyond the adjacent discend portion. The opposite end portion will thereby clear the adjacent projecting end portion and the lid disc can be removed from the frame. Children in the dangerous age will normally not be able to copy such motion pattern and therefore the lid will prevent such children from gaining access to the contents of the container on which the lid is mounted. At the same time the lid has the advantage that it does not require any special finger strength to press and slide the lid disc in order to remove it from the frame and therefore the lid disc can also be removed by persons with arthritic fingers.

According to the invention, the stop means may comprise a boss projecting from each of the end portions of the lid disc, said boss engaging an opening in the adjacent projecting frame portion. As a result, both end portions of the lid disc must be pressed downwards at the same time and the lid disc subsequently be displaced in order to remove the lid disc from the frame. Such motion pattern provides optimum safety that children will not be able to open the lid, without at the same time making it difficult for grown-up persons to remove the disc from the frame.

Moreover, according to the invention the stop means may comprise a boss projecting at the one end portion of the lid disc, said boss engaging an opening in the adjacent projecting frame portion and an edge of each end portion abutting a corresponding abutment surface on the interior of the frame. According to this embodiment both end portions of the lid disc should also be pressed downwards at the same time in order to render possible a displacement and thereby the removal of the lid disc.

Further according to the above embodiment, the end portion not provided with a boss can only just extend under the superjacent projecting frame portion. As a result, the lid disc can be mounted in the lid frame by first sliding the lid end portion provided with a boss under the corresponding projecting frame portion provided with an opening and subsequently, by snap action, moving the other end portion of the lid disc past the other projecting frame portion to abut it. Although the lid disc is easily and quicly mounted in the frame, it is necessary in order to remove the lid disc to press said lid disc downwards at both ends and subsequently to slide it in relation to the frame.

Moreover, according to the invention, the supporting protrusions may be longitudinal strips with a substantially plane supporting surface, said supporting surface gradually changing into downwards sloping surfaces at each end. As a result, the supporting surface provides excellent support for the disc and prevents a downwards deflection of the lid disc in the middle while the downwards sloping surfaces limit the deflection of the ends of the lid disc when pressed downwards.

Finally, according to the invention, the supporting protrusions are situated at a distance under the projecting portions substantially corresponding to the thickness of the disc.

The invention is described in greater detail below with reference to the accompanying drawings in which

Figure 1 is a plan view of a lid frame belonging to a lid acccording to the invention,

Figure 2 is a sectional view of the lid frame taken along the line II-II of Figure 1,

Figure 3 is a sectional view of the lid frame taken along the line III-III of Figure 1,

Figure 4 is a sectional view of the lid frame taken along the line IV-IV of Figure 1,

Figure 5 is a plan view, a rear view and a side view, respectively of a lid disc adapted for the lid frame shown in Figures 1 to 4 above,

Figure 6 is the lid disc shown in Figure 5 mounted in the lid frame shown in Figures 1 to 4 above, and

Figure 7 is another embodiment of a lid according to the invention, comprising a lid frame and a lid disc mounted therein.

Figures 1 to 4 show a lid frame 1 of a first embodiment of a lid according to the invention. In a plan view, the lid frame 1, which is made of plastics such as polypropylen of polyethylene, is substantially rectangular and comprises two substantially parallel frame side portions 2, 3 and two substantially parallel frame end portions 4, 5. Adjacent the bottom of the frame 6 ,a longitudinal strip 7, 8 extends from the interior side 9, 10 of each of the frame side portions 2, 3. Each longitudinal strip 7, 8 has a plane upper supporting surface 11, 12, said upper supporting surface gradually changing into a downwards sloping surface 13, 14, 15, 16 at each end.

A first rib 17 extends inwards from the inner surface 18 of the frame end portion situated to the right in Figure 1 at the upper end of the frame end portion 5. Viewed from the side, the lower surface 19 of the rib 17 is spaced from the supporting surfaces 11, 12, and is parallel to these. An opening 20 is provided in the rib 17 adjacent the inner surface 18 of the frame end portion 5.

Another rib 21 extends from the inner surface 22 of the frame end portion 4 situated to the left in Figure 1 at its upper end. The rib 21 extends parallel to the supporting surfaces 11, 12 and has a lower surface 37, said lower surface flushing with the lower surface 19 of the first rib 17. Furthermore, the other rib 21 has a protrusion 23 on its lower surface 37, said protrusion forming an abutment edge 24 immediately inside the edge 25 of the rib.

Figure 5 shows a lid disc 26 mountable in the lid frame 1 of Figures 1 to 4. The lid disc 26 is of plastics, such as polypropylen or polyethylene and has opposite parallel lateral edges 27, 28 and opposite substantially parallel end edges 29, 30, the end edge shown to the right in Figure 5 however being slightly curved corresponding to the curvature of the inner surface of the frame end portion of the frame situated to the right in figure 1. At the slightly curved end edge 29 a boss 31 extends upwards from the upper surface of the lid disc. The boss 31 is adapted to engage the opening 20 of the rib 17. The lateral edges 27, 28 of the lid disc are placed at a mutual distance corresponding to the distance between the interior sides 9, 10 of the frame side portions 2, 3, while the distance between the end edges 29, 30 of the lid disc corresponds to the distance between the abutment edge 24 of the rib 21 and the inner surface 18 of the frame end portion 5. Furthermore, the lid disc 26 has a thickness substantially corresponding to the distance between the supporting surfaces 11 and 12 of the longitudinal strips 7, 8 and the lower surface of the ribs 17, 21.

When mounted in the frame 1 (cf. figure 6), the lid disc 26 is supported by the longitudinal strips 7, 8 in the middle portion and along its lateral edges, and its end portions 33, 34 extend under the projecting ribs 17, 21 and abut the underside of said ribs. At the same time the curved end edge 29 of the lid disc abuts the inner surface 18 of the frame end portion 5, the end edge 30 of the lid disc 26 abuts the abutment edge 24 of the rib 21 and the boss 31 extends into the opening 20.

In order to remove the lid disc 26 from the frame 1, pressure must be exerted on the lid disc 26 close to both its ends, whereby the disc attains the curvature indicated by the dotted line in Figure 6. The boss is thereby disengaged from the opening 20 and the end edge 29 of the disc is brought out of contact with the abutment edge 24. The lid disc 26 , its ends still being pressed downwards, is subsequently displaced, to the right in Figure 6, until the end edge 29 abuts the inner surface 22 of the frame end portion 4. When pressure is removed from the end portion of the disc situated close to the rib 17 in this position, the end edge of the disc 29 moves past the edge 35 of the rib and the lid disc can be removed from the lid frame 1 by gripping said lid discend portion. In order to render possible the displacement of the lid disc 26 to free said lid disc from the frame as described above, there must of course be a cavity under the end portion 34 extending a distance A beyond the end edge 29 of the lid disc 26 at least corresponding to the distance B which the opposite end portion 32 of the disc extends under the rib 17.

Figure 7 is a longitudinal cross-section corresponding to that shown in Figure 6 of an alternative embodiment of a lid according to the invention. The lid comprises a lid frame 101 and a lid disc 126 mounted therein.

The lid frame 101 has two parallel frame side portions not shown, said frame side portions on the interior side being provided with a longitudinal strip 108, having an upper supporting surface 12. Furthermore, the lid frame 101 has two frame end portions 104, 105, said frame end portions having at their upper end a rib extending inwards from their inner surface 118, 122. An opening 120, 140 has been provided in each of these ribs. The lid disc 126 has a width substantially corresponding to the distance between the interior sides of the frame side portions and has end portions 133, 134 extending under the adjacent rib 121, 117. A boss 141, 131 is provided at each

end portion 134 and 133, said boss engaging the opening 120, 140 of the neighbouring rib 121. Finally, the lid disc 126 rests on the supporting surfaces 112 of the longitudinal strips 108. These supporting surfaces 112 gradually change into downwards sloping surfaces 114, 116 at each end.

The overlapping portions between the ribs 117, 121 of the frame 101 and the corresponding end portions 33, 34 of the lid disc 126 are shorter than the distance between the end edges 129, 130 of the lid disc 126 and the inner surfaces 122, 118 of the frame end portions 104, 105. As a result, the lid disc 126 can be removed from the frame 101 by pressing the disc 126 downwards at its ends and subsequently displacing it towards the frame end portions, until its edge abuts the interior surface of the frame end portion, thereby allowing the other end of the lid disc 126 to pass the edge of the adjacent rib whereby the lid disc can be dismounted from the frame.

Both the embodiments of the lid according to the invention described above are intended to be glued at the bottom 6, 106 of the lid frame 1 onto the outer surface of a container around an opening or a perforation for the formation of an opening in the container. It is however obvious and lies within the scope of the invention to form the frame in such a way that it can be fitted in an opening of a container or fastened to a rim portion of a container.

Claims

1. Child proof lid for a container, said lid comprising a lid frame (1, 101) firmly mountable on the container, and a lid disc (26, 126) detachably and supportedly mounted in the lid frame, said lid disc having two substantially parallel and opposing lateral edges (27, 28) and opposite end portions (33, 34; 133, 134) extending under projecting portions (17, 21; 117, 121) of the frame, **charac terised** in that the projecting portions of the frame (17, 21; 117, 121) are firm and that a stop means is provided to prevent the lid disc (26, 126) from being displaced in relation to the lid frame (1,101) in the plane of the lid disc, that the lid disc (26, 126) is elastically bendable and supported by protrusions (7, 8; 108) projecting under the parallel lateral edges of the lid disc (27, 28) at a distance from the end portions of the lid disc (33, 34; 133, 134) and that the lid frame (1, 101) has a cavity (36) under the end portions of the lid disc (33, 34; 133, 134), said cavity at least at the one end portion (33; 133, 134) extending a distance beyond the end portion, at least corresponding to the distance which the opposite end portion extends under the superjacent projecting frame portion (17, 117, 121).

2. A lid as claimed in claim 1, characterised by the stop means comprising a boss (141, 131) projecting from each of the end portions (133, 34) of the lid disc (126), said boss engaging openings (140, 120) in the adjacent projecting frame portion (117, 121).

3. A lid as claimed in claim 1, characterised by the stop means comprising a boss (31) projecting from the one end portion (33) of the lid disc (26), said boss engaging an opening (20) in the adjacent projecting frame portion (17) and an edge (29, 30) of each end portion (33, 34) abuting a corresponding abutment surface (24, 18) on the interior of the frame (1).

4. A lid as claimed in claim 3, characterised by the end portion (34) not being provided with a boss (31) only just extends under the superjacent projecting frame portion (21).

5. A lid as claimed in claim 1, characterised by the supporting protrusions (7, 8; 108) being longitudinal strips with a substantially plane supporting surface (11, 12: 112), said supporting surface gradually changing into downwards sloping surfaces (13, 14, 15, 16, 114, 116) at each end.

6. A lid as claimed in claim 1 or 5, characterised by the supporting protrusions (7, 8; 108) being at a distance below the projecting frame portions (17, 21; 117, 121) substantially corresponding to the thickness of the lid disc (26; 126).

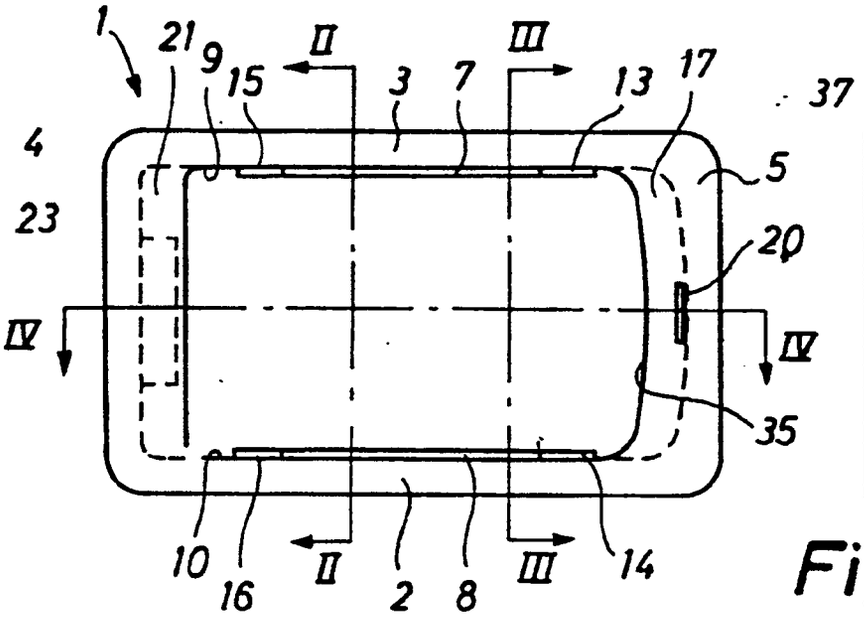


Fig.1

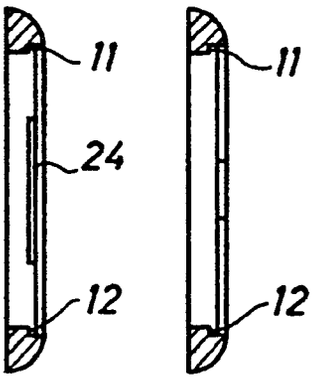


Fig.2 Fig.3

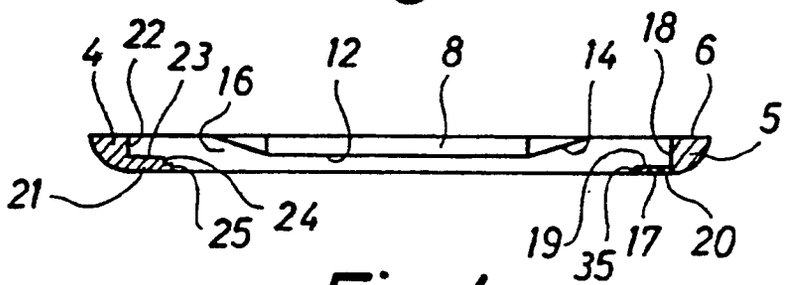


Fig.4

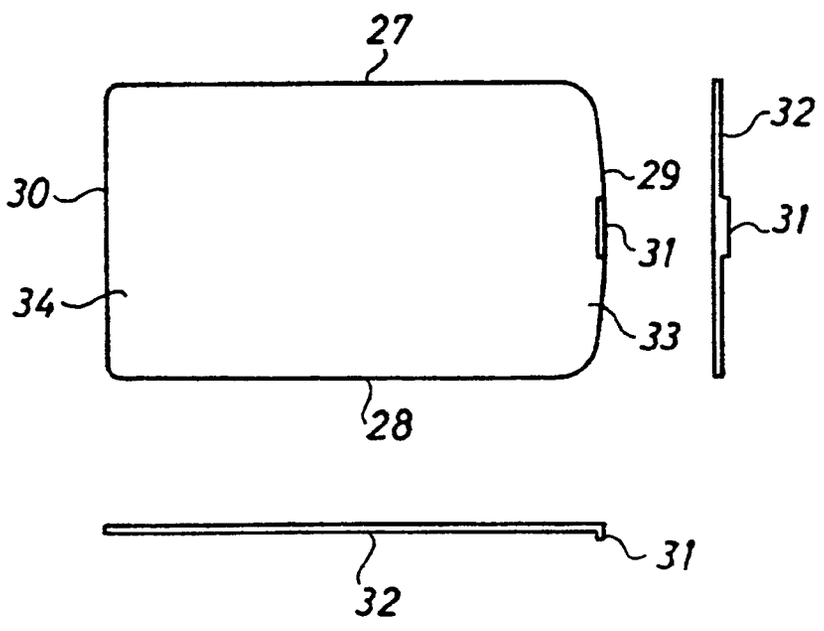
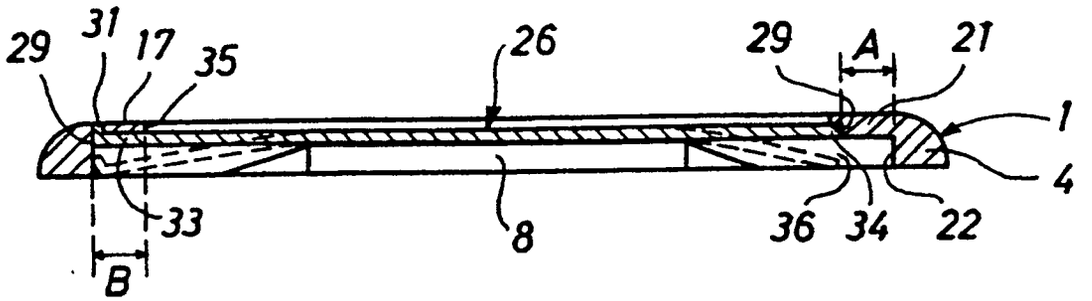


Fig.5


29
31
17
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26
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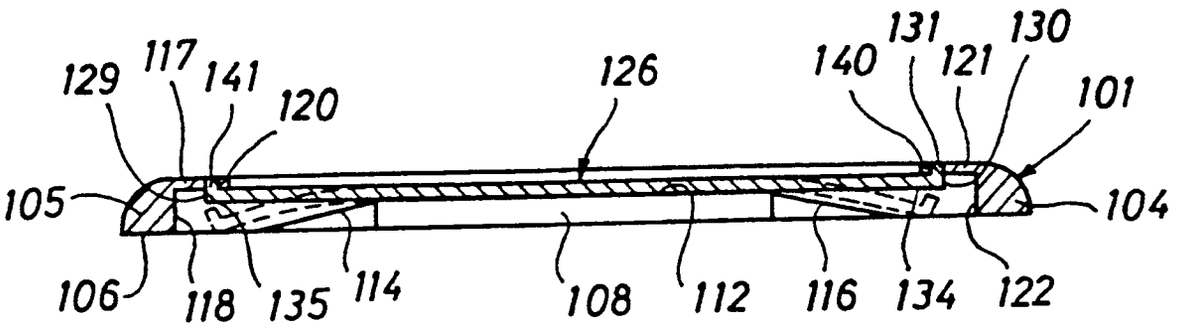
A
21
1
4
33
8
36
34
22
B

Fig.6


129
117
141
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126
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131
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101
105
104
106
118
135
114
108
112
116
134
122

Fig.7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 61 0018

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)
D,A	DE-A-3 643 603 (HENKEL) * the whole document *	1	B65D43/02 B65D55/02
A	DE-C-645 930 (ROMMLER) * page 2, line 115 - page 3, line 5; figure 6 *	1	
A	GB-A-164 617 (BROWNING) * the whole document *		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	30 MAY 1991	NEWELL P.G.

CATEGORY OF CITED DOCUMENTS

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