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

(11) Publication number: **0 112 691**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **83307615.1**

(22) Date of filing: **14.12.83**

(51) Int. Cl.³: **B 65 D 43/04**, B 44 D 3/00

(30) Priority: **17.12.82 GB 8235928**

(43) Date of publication of application: **04.07.84 Bulletin 84/27**

(84) Designated Contracting States: **BE CH DE FR IT LI NL SE**

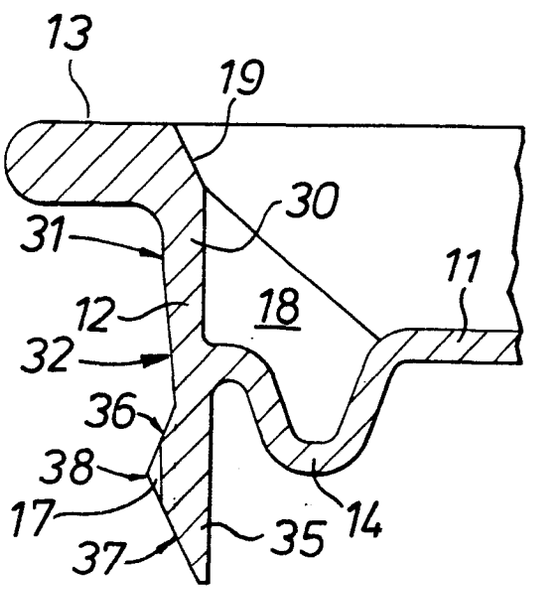
(71) Applicant: **MARDON ILLINGWORTH LIMITED, Forest Works Coxmoor Road, Sutton-in-Ashfield Nottinghamshire NG17 5LH (GB)**

(72) Inventor: **Dudzik, Henryk, 4 Small Holdings Old Mill Lane, Forest Town Mansfield Nottinghamshire (GB)**

(74) Representative: **MacGregor, Gordon et al, ERIC POTTER & CLARKSON 14 Oxford Street, Nottingham, NG1 5BP (GB)**

(54) Container lid.

(57) The lid is of the type intended for plug-fitting in a container mouth and has a top (11) and a skirt (12) provided with a flange (13) to permit levering of the lid out of engagement with a container. The lid is a one-piece plastics moulding and the skirt is formed with a cylindrical part (31) adjacent the flange for forming a first seal with the lip (22). A resiliently flexible free end part of the skirt has a frusto-conical surface (36), which engages with the inner end (25) of the lip to define a second seal, spaced from the first seal. Recesses (17) are provided at the radially outer edge of the surface (36), to permit air to escape, as the skirt slides down the lip (22) during fitting of the lid in the container.



EP 0 112 691 A2

CONTAINER LID

This invention relates to a container lid of the type having a top, a skirt which plug fits into a container mouth and a peripheral flange which projects outwardly of the skirt, over a lip of the container mouth, in use, to permit insertion of a tool under the flange for levering off the lid from the container.

The invention is especially, but not essentially, concerned with lids for paint containers. Such lids are usually pressed from sheet metal, but plastics moulded lids have recently been introduced. These have tended to be reproductions in plastics of the lid constructions previously devised for manufacture in metal. Some problems have accordingly arisen, including problems of airtight sealing of the lid in the container mouth and of removing the lid from the container.

The present invention provides a container lid of the type having a top, a skirt for plug-fitting in an annular lip defining a container mouth, and a peripheral flange projecting outwardly of the skirt for engagement by a tool for levering off the lid from the container, characterised in that the lid is a plastics moulding and in that the skirt is formed with first and second axially spaced annular sealing surfaces, the first annular surface being formed near the flange for sealing with the inner periphery of the lip, and the second annular surface being obtusely angled relative to the first annular surface, as viewed in cross-section, for sealing with the inner end part of the lip, the portion of the skirt, provided with the second annular surface, being capable of resilient flexing movement relative to the first annular surface during insertion of the skirt into the lip.

Preferably, the top of the lid joins the skirt at a position adjacent the second surface of the skirt. Advantageously an annular channel is provided in the top adjacent

the skirt for strength.

It is also preferred that the top is inset and a multiplicity of gussets are provided between the skirt and the top and spaced around the top. This inhibits flexing of the first surface of the skirt and facilitates levering off of the lid, in use.

It is also preferred that the outermost peripheral part of the second surface of the skirt is provided with at least one recess. This ensures that air can escape from the container as the lid is pushed into position, but the recess is below the second seal between the second surface and the inner edge of the lip in the fully engaged position.

The free end part of the portion provided with the second surface preferably has an external bevel to assist insertion of the skirt into the container lip.

Reference is now made to the accompanying drawings, wherein:-

Figure 1 is a perspective view of a lid according to the invention with a portion broken away;

Figure 2 is an enlarged detail sectional view of the lid; and

Figures 3, 4 and 5 show three stages of inserting the lid into a container lip.

The lid illustrated is a one-piece plastics, injection moulding and comprises a top 11 of disc form encircled by a skirt 12. The top of the skirt 12 is provided with a radially outwardly projecting peripheral flange 13.

As shown in Figure 5, the lid is for plug-fitting into a container. The particular container shown is for holding paint, or similar liquid material, and has a cylindrical body 20 provided with a radially inwardly directed flange 21 which is downturned to define a lip 22. The lip has a cylindrical surface 23 co-axial with the body 20 and has a radiussed outer edge 24 and a radiussed inner edge 25. The flange 21 is shaped to define a drip-receiving channel 26.

The skirt 12 of the lid is plug-fitted in the lip 22 with the skirt flange 13 seating on the container flange and

extending over the drip channel 26. The lid can be removed by means of a tool inserted in the drip channel and under the skirt flange, to lever the lid off the container.

Lids of this basic general form and containers of this form are very common.

As shown in Figures 1 and 2, the top 11 of the lid is provided with a strengthening peripheral channel 14 adjacent the joint line of the top with the skirt. The top adjoins the skirt approximately midway between the axial ends of the skirt. The skirt has a first annular portion 30 with a cylindrical outer surface 31 adjacent the flange 13. The cylindrical outer surface 31 merges into a frusto-conical outer surface 32 which reduces in diameter away from the cylindrical outer surface at a shallow angle thereto; approximately 5^{o} in this example. The first annular portion 30 of the skirt adjoins a second annular portion 35 and the top 11 adjoins the first portion 30 at a position adjacent the second portion 35.

The second annular portion 35 has a frusto-conical outer surface 36 adjacent the frusto-conical surface 32 of the first portion, this frusto-conical surface 36 of the second portion increasing in diameter away from the first portion and adjoining the latter at an obtuse angle as viewed in section; approximately 155^{o} in this example. The free end part of the skirt, defined by the second portion 35, has a bevelled outer surface 37 reducing in diameter towards the free end and adjoining the frusto-conical surface 36 in a peripheral line 38.

The material is such that the second annular portion 35 of the skirt is capable of resilient flexing relative to the first annular portion 30, the joint of the top 11 with the skirt serving to rigidify the first annular portion of the skirt adjacent the second annular portion.

The second annular portion 35 has elongate recesses 17 (Figure 1) provided along the peripheral line 38 at spaced intervals.

Gussets 18 are spaced at frequent intervals around the

top 11 of the lid and each gusset extends across the channel 14, to the inner periphery of the channel, from the first annular portion 30 of the skirt 12. Each gusset terminates adjacent the flange 13 where the edge 19 between the flange and the skirt is bevelled.

The gussets rigidify the upper part of the lid and prevent flexing of the first annular portion 30 of the skirt. This facilitates levering off of the lid.

As shown in Figure 3, to insert the lid in the container lip 22, the bevelled surface 37 at the free end of the skirt is first engaged with the radiussed outer edge 24 of the lip 22. This facilitates entry of the skirt into the lip mouth with inward flexing of the second annular portion 35 of the skirt, as shown in Figure 4. As is apparent from Figure 4, as the second annular portion moves down the lip, air escapes from the container between the lip and the recesses 17 to avoid a piston effect.

The lid is pushed down until its flange 13 seats on the flange 21 of the container (Figure 5). In this position, the cylindrical outer surface 31 of the first portion 30 seals with the inner peripheral surface of the lip 22. The obtusely angled frusto-conical outer surface 36 of the second annular portion 35 extends beneath the lip, due to the resilient outward movement of the second annular portion, and this surface 36 seals with the radiussed inner edge 25 of the lip, so that a double seal is formed. In this position, the recesses 17 lie below the lip 22 and do not affect the seal.

CLAIMS

1. A container lid of the type having a top (11), a skirt (12) for plug-fitting in an annular lip (22) defining a container mouth, and a peripheral flange (13) projecting outwardly of the skirt for engagement by a tool for levering off the lid from the container, characterised in that the lid is a plastics moulding and in that the skirt is formed with first (31) and second (36) axially spaced annular sealing surfaces, the first annular surface (31) being formed near the flange (13) for sealing with the inner periphery of the lip, and the second annular surface (36) being obtusely angled relative to the first annular surface, as viewed in cross-section, for sealing with the inner end part of the lip, the portion (35) of the skirt, provided with the second annular surface, being capable of resilient flexing movement relative to the first annular surface during insertion of the skirt into the lip.

2. A container lid according to Claim 1, wherein the top (11) of the lid joins the skirt (12) at a position adjacent the portion (35) provided with the second annular surface.

3. A container lid according to Claim 2, wherein the top has an annular channel (26) around its periphery and adjoining the skirt.

4. A container lid according to Claim 2 or 3, in which the top is inset within the skirt and a multiplicity of gussets are provided between the skirt and the top and spaced around the top.

5. A container lid according to any preceding claim, in which the outermost peripheral part of the second surface (36) is provided with at least one recess, positioned, so as to be below the second seal in the fitted position of the lid in the container.

6. A container lid according to any preceding claim, wherein said first surface (31) is substantially cylindrical and is spaced from the second surface (36) by an intermediate frusto-conical surface (32) which reduces in diameter

from the first surface towards the second surface.

7. A container lid according to any preceding claim, wherein the free end part of the portion (35) having the second surface (36) has an external bevel (37).

8. A container lid according to Claim 7, wherein the bevel (37) joins the second surface (36) to define a triangular apex (38) as viewed in cross-section.

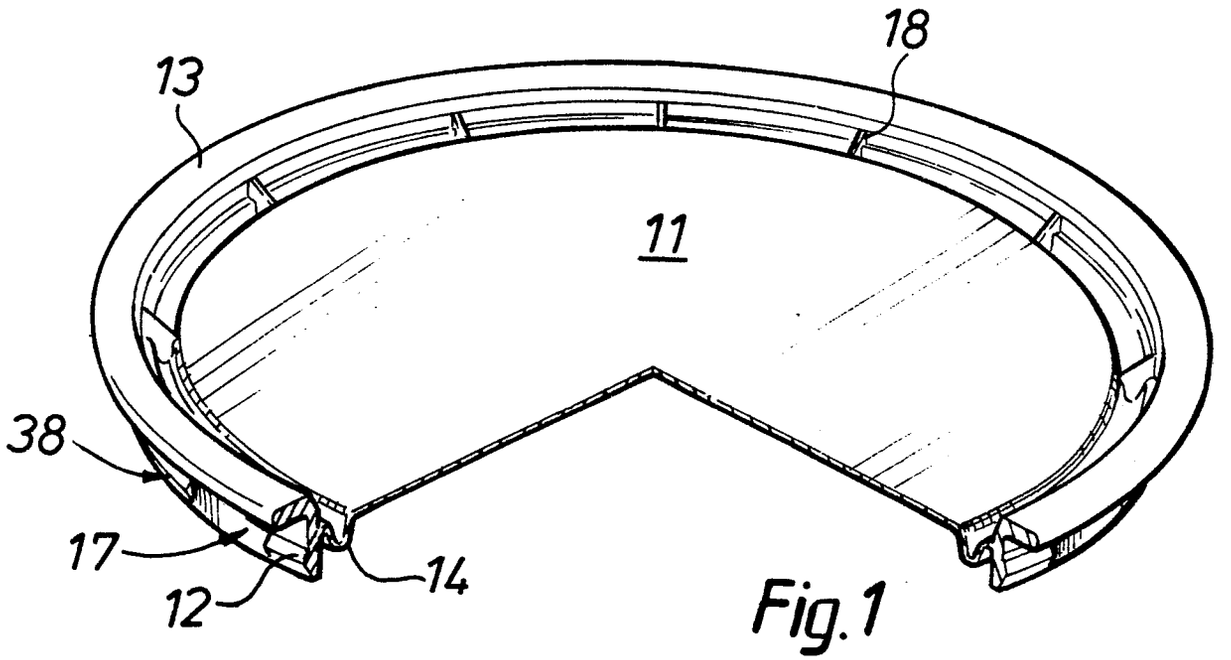


Fig.1

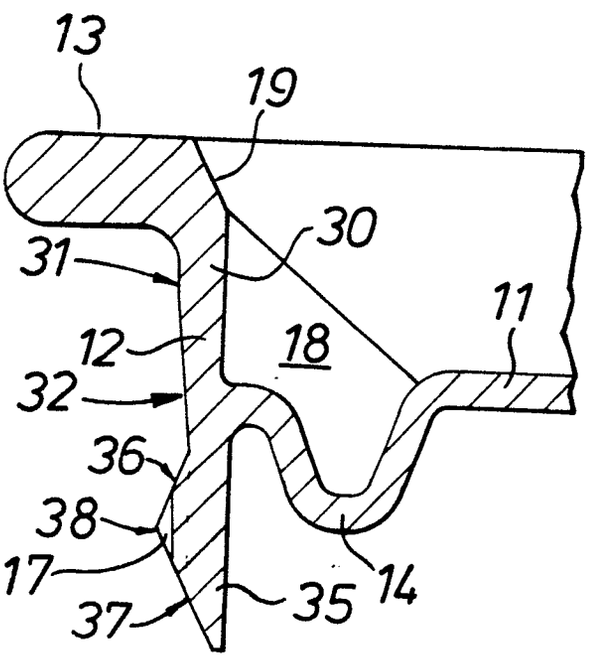


Fig.2

0112691

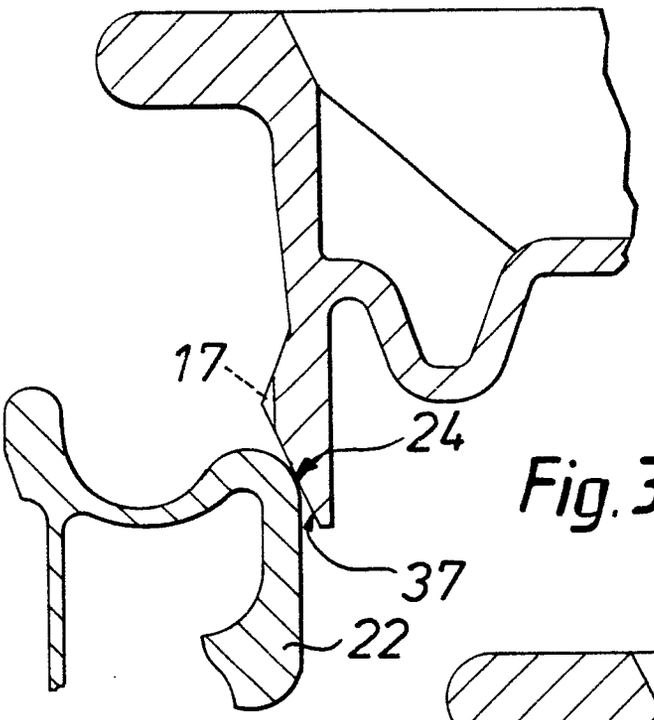


Fig.3

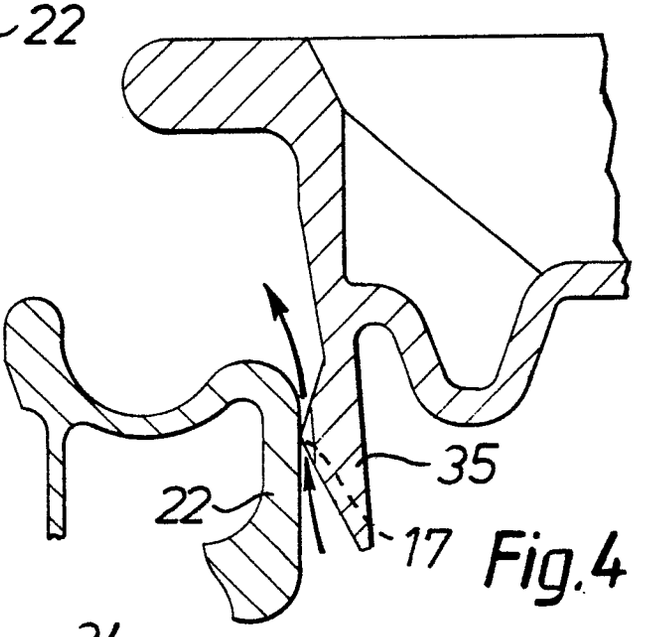


Fig.4

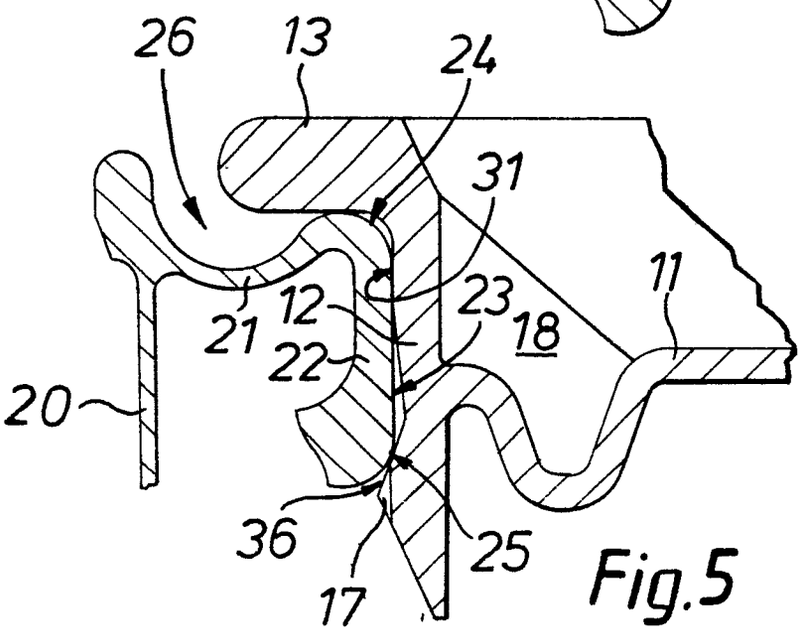


Fig.5