

PATENT SPECIFICATION

1,032,069

1,032,069



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Date of filing Complete Specification: September 1, 1964.

Application Date: December 13, 1963.

No. 49421/63

Complete Specification Published: June 8, 1966.

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Index at Acceptance:—B8 D (1A1, 1A4B2, 1B1, 3B, 7M).

Int. Cl.:—B 65 d.

COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Improvements in or relating to Cans

WE, THE METAL BOX COMPANY LIMITED, a Company Incorporated under the laws of Great Britain, of 37 Baker Street, London, W.1., England, do hereby declare the invention, for which we pray that a Patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to cans, and particularly to cans for containing a liquid, for example paint, of the kind in which the can is arranged to be closed by a lid.

As is well understood, the purpose of a can of the kind above-mentioned is to preserve a very tight seal between the lid and the can. Ideally, the best seal would be obtained by line contact between two cylinders whose axes are parallel but in designing cans the best seal which can be obtained is one in which there is line contact between a cylinder and a plane. Because of this it has, heretofore, been necessary when removing the lever lid from a can progressively to lever round the lid because the effect of levering the lid upwards at any one position around its circumference is to increase the interference between the lid and the mouth-ring of the can, the increase in interference being proportionate to the angle through which the lid is levered.

It is a main object of the present invention to provide a can of the kind above-mentioned which gives a seal comparable with that of the known kinds of can but the lid of which can be removed by levering thereof at one position only.

According to the invention there is provided a can and a lid therefor having a depending skirt, wherein the can has a body, the top of which is provided with a cylindrical neck having a mouth-ring which is defined by or is adjacent to a protrusion the

greatest external diameter of which is slightly greater than the internal diameter 45 of the skirt of the lid, and the skirt is a cylinder, the internal diameter of which is greater than the external diameter of that portion of the neck between the body and said protrusion and which skirt, when the lid is applied to the can, effects an interference fit with the portion of the greatest external diameter of the protrusion and is radially spaced from said neck portion; the difference between the greatest external 50 diameter of the protrusion and the internal diameter of the skirt, the radial spacing between the skirt and said neck portion, the internal depth of the lid, and the natural rigidity of the skirt and mouth-ring being 60 so selected that when the lid has been applied to the can and is displaced by a lever applied beneath any point on the circumference of the rim of the lid, the interference fit between the skirt and said protrusion is eliminated. 65

In order that the invention may be clearly understood some embodiments thereof will now be described, by way of example, with reference to the drawings, accompanying the Provisional Specification, in which:—

Figure 1 is an elevation in half-section through a can according to the invention.

Figure 2 is a section to enlarged scale of a part of Figure 1, 75

Figure 3 is a view illustrating the manner in which the lid is removed from the can, the lid having been partly raised by a lever applied thereto.

Figures 4 to 7 illustrate diagrammatically 80 alternative forms of mouth-ring, and

Figures 8 to 11 illustrate diagrammatically alternative forms of lid.

In the drawings like reference numerals refer to like or similar parts. 85

Referring to Figures 1 and 2, the can

[Price 4s. 6d.]



comprises a can body 1 the top of which is provided with a mouth-ring 2 which defines the mouth 3 of the can and which is arranged to be closed by any one of the lids described below. The mouth-ring 2 is connected to the body 1 in the usual manner by a seam 4 and the bottom 5 of the can, Figure 1, is connected to the body by a seam 6.

10 The mouth-ring is provided on a cylindrical neck portion 7 having at or adjacent the mouth 3 a protrusion 8 the greatest external diameter of which is greater than that of the internal diameter of the skirt, described below, ~~on~~ the lid, thereby to effect a seal between the lid and the mouth-ring when the lid is applied to the can. The relationship between the protrusion and the internal diameter of the skirt of the lid is determined by the actual design of the components and the thickness of the sheet metal used in their manufacture. In the embodiment of the invention shown in Figures 1 and 2 the interference between the portion of greatest diameter of the protrusion and the skirt of the lid is in the range 0.010 to 0.020 inch. As shown in Figures 1 and 2 the protrusion 8 consists of a curl defining the mouth of the neck portion and the curl is an out-turned curl connected with the neck 7 by a substantially S-shaped portion 9 of the neck ring. The curl is a substantially circular curl and the neck 7 extends substantially radially from the curl.

35 The lid comprises a crown 10 and a skirt which depends from the crown, and which is a cylinder, the internal diameter of which is greater than the external diameter of the neck portion 7 and which when the lid is applied to the can, effects an interference fit with the portion of greatest diameter of the protrusion 8 and is radially spaced from the neck portion 7. As shown in Figures 1 and 2, the skirt consists of inner and outer annular walls 11, 12 disposed in spaced radial relation substantially parallel with the longitudinal axis of the lid, and the walls 11, 12 are connected at the ends thereof remote from the crown 10 by a rim 13 engageable as described below by a lever 14. The wall 12 has the opposite end thereof connected with the crown 10 and as shown in Figures 1 and 2 this connection is effected by an arcuate portion 15. That end of the wall 11 which is nearest the crown 10 is intumed towards the wall 12 and is close to the wall 12. As shown in Figures 1 and 2 the internal portion consists of a partial curl 16 a part of which is nested in the arcuate portion 15 of the lid.

When the lid is applied to the can to effect closing thereof an annular space or radial clearance 17 is provided between the inner wall 11 of the lid and the neck 7 and a seal is effected between the protrusion 8

and the curved plane of the wall 11, these two faces being maintained in contact by virtue of the interference fit between the portion of greatest external diameter of the protrusion 8 and the wall 11. This feature assists mechanical application of the lid to a container.

To remove the lid the lever 14, for example a coin, is applied between the top of the seam 4 and the rim 13 of the lid and the lid is pressed upwards and outwards by the lever. During the upward and outward movement of the lid the interference fit between the wall 11 and the protrusion 8 slackens. This is due to the fact that the lid, during its upward movement, is in effect hinged about the contact point 18, Figure 3, between the wall 11 and the protrusion 8 at a position diametrically opposite the position of application of the lever 14. This means that the wall 11 immediately above the position of application of the lever 14 is being moved away from the position 19 on the protrusion 8 along a curved path 20 generated by an arc struck from the point 18 about which the lid is hinged and the portion 21 of the skirt which is directly below and most remote from the hinge point 18 moves toward the neck 7. The combination effect of the internal diameter of the skirt wall 11, the internal depth of the lid, the initial interference fit between the wall 11 and protrusion 8, the radial clearance 17 between wall 11 and the neck 7, and the natural rigidity of the lid and the mouth-ring, ensures that the portion 21 of the lid is, on upward levering of the lid by the lever 14, free to move towards the neck 7, as just described, until both the wall 11 and the protrusion 8 have fully restored to their natural positions, thus eliminating the interference fit between the wall 11 and protrusion 8, at which point complete removal of the lid can be readily effected by hand.

Referring to Figures 4 to 7, the mouth-ring of Figure 4 is similar to that of Figures 1 and 2 but the protrusion 8 consists of an internal curl. In Figure 5 the protrusion 8 consists of an out-turned curl in respect of which the neck portion is substantially tangential, and in Figure 6 the protrusion 8 is an intumed curl with which the neck 7 is substantially tangential. In Figure 7 the protrusion 8 is an external bead formed in the neck 7 to be adjacent to the mouth of the can which is defined by a curl 21.

Referring to Figures 8 to 11, the lid of Figure 8 is similar to that of Figures 1 and 2 but the crown of the lid is flat. The lid of Figure 9 has the inner wall 11 connected to the crown of the lid and the partial curl 16 is formed on the wall 12. In Figure 10 the skirt of the lid consists of one wall only with a rim 13 defined by a curl and in Figure 11 the skirt also consists of a single



ring
wall and the rim 13 is a "raw" edge.
It is found that by constructing the mouth-ring and lid of a can in the manner above described, and with any combination of ring and lids as herein described with reference to the drawings, it is possible to remove the lid by applying the lever 14 to one position only instead of, as has been necessary with liquid-filler cans fitted with lever-type lids prior to the invention, having to apply the lever progressively around the lid.

WHAT WE CLAIM IS:—

1. A can and a lid therefor having a depending skirt, wherein the can has a body the top of which is provided with a cylindrical neck having a mouth-ring which is defined by or is adjacent to a protrusion, the greatest external diameter of which is slightly greater than the internal diameter of the skirt of the lid, and the skirt is a cylinder, the internal diameter of which is greater than the external diameter of that portion of the neck between the body and said protrusion and which skirt, when the lid is applied to the can, effects an interference fit with the portion of greatest external diameter of the protrusion and is radially spaced from said neck portion; the difference between the greatest external diameter of the protrusion and the internal diameter of the skirt, the radial spacing between the skirt and said neck portion, the internal depth of the lid, and the natural rigidity of the skirt and mouth-ring being so selected that when the lid has been applied to the can and is displaced by a lever applied beneath any point on the circumference of the rim of the lid, the

interference fit between the skirt and said protrusion is eliminated.

2. A can according to Claim 1, wherein said protrusion consists of a curl defining the mouth-ring.

3. A can according to Claim 2, wherein the curl is an out-turned curl.

4. A can according to Claim 3, wherein the curl is connected with the neck portion by a substantially S-shaped portion.

5. A can according to Claim 1, wherein the protrusion consists of an external bead formed in the neck portion adjacent to the mouth-ring.

6. A can according to Claim 1, wherein the protrusion consists of a substantially circular curl from which the neck portion extends substantially radially.

7. A can according to Claim 6, wherein the curl is an inturned curl.

8. A can according to any one of Claims 1 to 7, wherein the skirt of the lid consists of inner and outer annular walls disposed in spaced radial relation substantially parallel with the longitudinal axis of the lid, said walls being connected at the ends thereof remote from the crown of the lid by a rim engageable by said lever and one of the walls having the opposite end thereof connected with said crown.

9. A can and a lid thereof according to Claim 1, constructed and arranged to operate substantially as herein described with reference to the drawings accompanying the Provisional Specification.

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5. A can according to Claim 1, wherein the protrusion consists of an external bead formed in the neck portion adjacent to the mouth-ring.

6. A can according to Claim 1, wherein the protrusion consists of a substantially circular curl from which the neck portion extends substantially radially.

7. A can according to Claim 6, wherein the curl is an inturned curl.

8. A can according to any one of Claims 1 to 7, wherein the skirt of the lid consists of inner and outer annular walls disposed in spaced radial relation substantially parallel with the longitudinal axis of the lid, said walls being connected at the ends thereof remote from the crown of the lid by a rim engageable by said lever and one of the walls having the opposite end thereof connected with said crown.

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