Body-necking a wall-ironed can

Querschnittsverminderung einer Dose mit gezogenen Wänden

Rétreint de diamètre d’une boîte à paroi étirée

Designated Contracting States:
AT BE CH DE DK ES FR GB IT LI NL SE

Priority: 21.02.1997 NL 1005340

Date of publication of application: 16.09.1998 Bulletin 1998/38

Proprietor: Corus Staal BV
1970 CA Ijmuiden (NL)

Inventors:
• Hogendoorn, Auke
  1702 VT Heerhugowaard (NL)

References cited:
EP-A- 0 733 415
US-A- 3 786 957

Representative: Herman de Groot, Johan Willem
Corus Technology BV
Corus Intellectual Property Department
PO Box 10000
1970 CA Ijmuiden (NL)

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).
The invention relates to a method for manufacturing a metal, body-necked can with an ironed wall, for example one intended for being provided on one open side with an easily opening lid in order thereby to form a beverage can, comprising the stages of reducing the diameter of the can with the ironed wall by necking the wall up a considerable part of the height of the can, to be referred to as body-necking, and applying a neck rim by necking the top rim of the can.

Tests have shown that wrinkling can be prevented and that a simpler manufacturing method is possible if, and the invention is based essentially on this, the invention is possible to form a can by applying an internal overpressure. Furthermore, during body-necking a centring pin is used with a diameter equal to the internal neck diameter of the can.

The neck applied for body-necking gives the can body rigidity and holds it under tension so that wrinkling is prevented during body-necking. The method in accordance with the invention makes it possible to body-neck without a knock-out. However, because of the axial loading of the can during body-necking, the body must be supported during body-necking by applying an internal overpressure. Furthermore, during body-necking a centring pin is used with a diameter equal to the internal neck diameter of the can.

In practice it is found in accordance with the invention that it is possible to form a Ø 66 mm body a can with a circumference of less than Ø 63.5 mm or even Ø 62 mm with a 202 neck. A 202 neck is taken to be a neck with a diameter (including the flange with which the lid is applied) of 2 2/16 inch (= 53.98 mm). The internal diameter of the can neck is then approx. 52.3 mm.

The invention is also embodied in a method for manufacturing a shaped can by inflating a can which is obtained by applying the method in accordance with one of the Claims 1-4.

After pressure loads have been introduced in the material by body-necking, the material is better able to stretch and the can is able to be formed to a considerable extent, for example by inflating.

The method in accordance with the invention has been found highly suitable for cans manufactured from a packaging steel suited to wall-ironing, and manufactured from an aluminium alloy suited to wall-ironing.

The invention will now be further illustrated by reference to the drawings in which:

Fig. 1 shows schematically the successive stages of the method in accordance with the invention, and Fig. 2 shows schematically the inflating of a necked, body-necked body in accordance with the invention.

Fig. 1 shows schematically the result of three sub-processes a, b and c of the method in accordance with the invention. Fig. 1a shows a wall-ironed can with a Ø 66 mm which in Fig. 1b is transformed into a necked can with a 202 neck and a flange. In Fig. 1c the 202 necked can is body-necked in a die (1) into a circular cylindrical body with an outside diameter of less than Ø 63.5 mm or even less than Ø 62 mm. With a hollow centring pin (2) with an outside diameter equal to the internal neck diameter of the can, the can is placed under an internal overpressure for example by using compressed air.

Fig. 2 shows schematically the inflating procedure in a shaping mould (3) of the body-necked, wall-ironed, circular cylindrical body from Fig. 1c into a shaped can.

Claims

1. Method for manufacturing a metal, body-necked can with an ironed wall, for example one intended for being provided on one open side with an easily opening lid in order thereby to form a beverage can,
comprising the stages of reducing the diameter of the can with the ironed wall by necking the wall up a considerable part of the height of the can, to be referred to as body-necking, and applying a neck rim by necking the top rim of the can, characterized in that prior to being body-necked it is first necked at the top rim thereof.

2. Method in accordance with Claim 1, characterized in that the body-necking is carried out with a knock-out with a circular cylindrical shape with an outside diameter corresponding to the internal neck diameter of the neck rim.

3. Method in accordance with one of the preceding Claims, characterized in that a can of Ø 66 mm is necked to a neck with Ø 53.98 mm and then body-necked into a circular cylindrical body with an outside diameter of less than Ø 63.5 mm.

4. Method in accordance with one of the preceding Claims, characterized in that a can of Ø 66 mm is necked to a neck with Ø 53.98 mm and then body-necked into a circular cylindrical body with an outside diameter of less than Ø 62 mm.

5. Method for the manufacture of a shaped can by inflating a can which is obtained by applying the method in accordance with one of the Claims 1-4.
5. Procédé de fabrication d'une boîte façonnée, en faisant gonfler une boîte obtenue en appliquant le procédé selon l'une des revendications 1 à 4.