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

(11) EP 0 919 482 A1

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
02.06.1999 Bulletin 1999/22

(51) Int Cl.6: **B65D 8/04**

(21) Application number: **98305031.1**

(22) Date of filing: **25.06.1998**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **27.11.1997 JP 326013/97**

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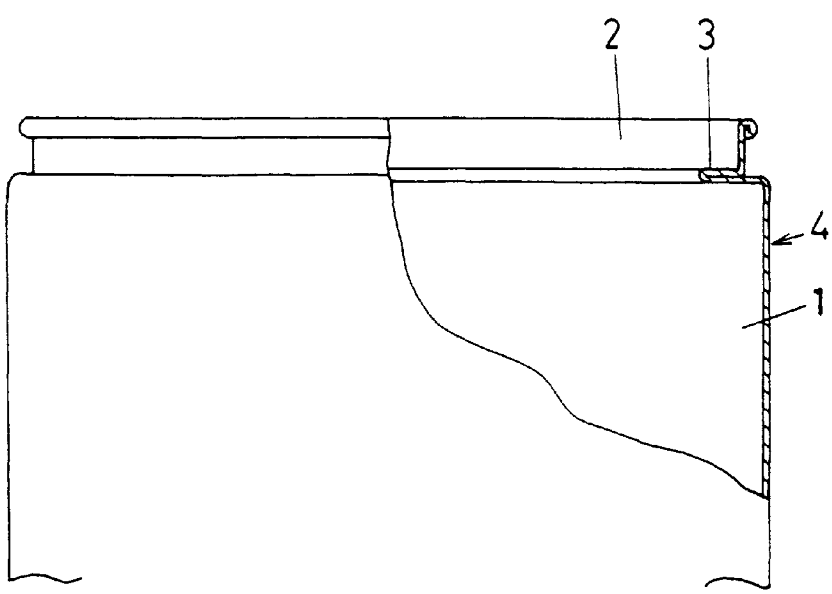
(54) **Metallic can and method of manufacture of same**

(57) A metallic can (4) is disclosed which includes a can shell (1) formed to have an opening (2) on one end or at the top and an annular flange (3) formed as an integral part of the can shell. A method of manufacturing such a metallic can (4) is also disclosed which includes the steps of forming a metallic can shell (1) having an opening on one end or at the top, reducing the diameter of the area of the formed can shell (1) delimiting the opening and elongating that area of the can shell outwardly in parallel with the axis of the can shell, thereby producing a reduced diameter opening (2), pressing the part of the inner can shell wall located near the reduced diameter opening inwardly toward the center of the can shell and thereby providing an annular projection (12b) extending from the inner can shell wall inwardly toward the center of the can shell, and flattening the annular projection (12b) by pressing it in the direction parallel with the axis of the can shell (1), thereby providing an annular flange (3) formed on the part of the inner can shell wall located near the reduced diameter opening as an integral part of the can shell (1).

FIG. 1



Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates generally to a can and a method of manufacturing the same. More particularly, it relates to a metallic can including a can shell with an opening on one end or at the top and an annular flange formed as an integral part of the can shell on its inner side wall in the neighborhood of the opening of the can shell for attaching a separator film or foil sheet to the said annular flange to seal the can hermetically, and a method of manufacturing such a metallic can.

Description of the Prior Art

[0002] The term "scraper" as used herein should be understood to mean any tool that may be used to remove any extra part of a content on a spoon or like by rubbing that part off, when the content is taken out of a can by using the spoon.

[0003] There is known a conventional metallic can that has an annular flange on the inner wall side of the can shell in the neighborhood of the opening on one end thereof for attaching a separator film or foil sheet to the said annular flange. For the known metallic can, the annular flange is provided separately from the can shell during the can manufacturing process, and is then fitted around the inner side wall of the can shell and secured thereto.

[0004] One disadvantage of the conventional metallic can is that the annular flange and the can shell are made of a different material and are produced separately from each other. This increases the usage of the material. In particular, the can manufacturing process involves two different steps, i.e., the step of forming an annular flange and the step of attaching it to the can shell formed separately from it. An additional disadvantage, which is associated with the above disadvantage, is that the manufacturing costs for the final metallic can products must be increased.

SUMMARY OF THE INVENTION

[0005] In order to circumvent the above-mentioned disadvantages, an object of the present invention is to provide a metallic can that includes an annular flange formed on the inner side wall of a can shell near the opening of the can shell as an integral part thereof by adding the process for forming the said annular flange into the manufacturing process of said can.

[0006] One aspect of the present invention is to provide a metallic can product that includes an annular flange that is formed on the inner side wall of a can shell near the top opening of the can shell as an integral part thereof.

[0007] Another aspect of the present invention is to provide a method of manufacturing a metallic can product, including the steps of reducing the diameter of the area of a formed metallic can shell delimiting an opening on one end thereof by elongating that area outwardly in parallel with the axis of the can shell for thereby providing a reduced-diameter opening, pressing the portion of the can shell wall located near the reduced-diameter opening inwardly toward the center of the can shell for thereby providing an annular projection extending from the inner can shell wall inwardly toward the center of the can shell, and flattening the annular projection by pressing it in the direction parallel with the axis of the can shell for thereby providing the annular flange on the inner can shell wall as an integral part of the can shell.

[0008] According to the method of the present invention, an annular flange may be formed as an integral part of a metallic can shell on the portion of its inner side wall located near the top opening, and this formation may be performed as a part of the existing manufacturing process during which a metallic can shell is formed. Thus, such metallic can, including the integral annular flange, may be produced efficiently in the successive manner on the same production line used in the existing manufacturing process. As there is no need to form the annular flange separately from the can shell as in the prior art, material may be saved, and the manufacturing cost may be reduced accordingly.

[0009] According to the method of the present invention, the area of the can shell delimiting the top opening may be reduced diametrically by elongating that area outwardly in parallel with the axis of the can shell. Thus, the thickness of the area delimiting the opening can remain unchanged, and no deformation such as wrinkles can occur on that area.

[0010] For forming the annular flange according to the method of the present invention, an annular projection may be formed by elongating the part of the can shell wall located near the opening by pressing that part inwardly toward the center of the can shell, such that the annular projection extends from the inner side wall inwardly toward the center of the can shell. Therefore, no deformation such as wrinkles can occur on the outer can shell side wall.

[0011] Finally, the annular projection may be flattened by applying the pressure upon it in the transverse direction. The annular flange thus obtained has the double construction including the upper and lower parts formed like a U shape. Thus, it has the highly strong construction.

[0012] It may be appreciated that the method according to the present invention, during the manufacturing process, avoids that the area of the can shell delimiting the opening be unnecessarily thickened, or any deformation such as wrinkles that would affect the appearance of the outer side wall of the can shell. Rather, the highly strong annular flange can make the opening area more strong enough to resist any external force. Thus, the method of the present invention allows for use of any can material that is comparatively thin.

[0013] The method according to the present invention may include an additional step of curling the area of the can shell delimiting the reduced-diameter opening in the usual manner known per se, before or after the step of forming the annular projection.

[0014] Furthermore, the method according to the present invention may include an additional step of mounting a bottom plate on the area of the can shell delimiting an opening on the other end or bottom in the usual manner also known per se, following the preceding steps described above.

[0015] According to the metallic can that may be obtained as described above, it includes the annular flange formed as an integral part of the can shell and extending inwardly from the inner side wall located near the opening. As the annular flange may be formed from the base can material, it can save material. Despite that, the area of the can shell delimiting the opening can be strengthened, and no deformation such as wrinkles can occur on the outer can shell wall. Thus, the good appearance can be retained.

BRIEF DESCRIPTION OF DRAWINGS

[0016]

Fig. 1 is a front view of a part of top opening of metallic can according to a particularly preferred embodiment of the present invention, shown partly cutaway and with some parts omitted;
Fig. 2 (a) to Fig. 2 (f) illustrate the process of manufacturing a metallic can according to a particularly preferred embodiment of the present invention; and
Fig. 3 is a front view illustrating the details of the use of the metallic can according to a particularly preferred embodiment of the present invention, shown partly cut-away and with some parts omitted.

DETAILS OF THE PREFERRED EMBODIMENTS

[0017] Several preferred embodiments of the present invention are described below in further detail.

(Embodiment 1)

[0018] A first preferred embodiment of a metallic can according to the present invention is described by referring to Figs. 1 and 3.

[0019] The metallic can, generally shown by 4, includes a can shell 1 having an opening 2 on one end or at the top, and an annular flange 3 that is formed as an integral part of the can shell 1 such that the annular flange 3 extends from the inner wall of the can shell 1 inwardly toward the center of the can shell in the neighborhood of the opening 2. When the metallic can 4 is used, the can 4 includes a bottom plate 16 on the other end thereof opposite the opening 2, and a separator sheet 5, such as film, foil and the like, covering the opening 2 and having its peripheral margin attached to the annular flange 3 by any adhesive or like. The content is thus hermetically enclosed inside the can shell 1. The opening 2 may be closed by a can cover. The closure may be performed by pressing the can cover 6 onto the can shell (Fig. 3).

[0020] The part designated by 7 in Fig. 3 is a sealing band formed on the lower side of the peripheral wall 20 of the can cover 6, that is to say, a sealing band 7 is formed under the thinner wall portion 25 of the peripheral wall 20. The cover 6 can only be removed from the can shell 1 by detaching the sealing band 7 from the entire can cover 6.

(Embodiment 2)

[0021] The process of manufacturing a metallic can according to an embodiment of the present invention is described by referring to Fig. 2 (a) through Fig. 2 (f). First, a thin blank 8 (Fig. 2 (a)) for producing a metallic can may be formed to a cylindrical can shell 1 in the usual manner (Fig. 2 (b)). The peripheral area of the can shell 1 which delimits an opening 2a on one end thereof may then be elongated outwardly in parallel with the axis of the can shell, that is, in the direction of arrow 9 in Fig. 2 (b). This elongation may occur by reducing the diameter of the opening 2a until a reduced diameter opening 2 can be obtained (Fig. 2 (c)). Next, a curled portion 10 may be formed by curling the peripheral edge delimiting the opening 2 (Fig. 2 (d)). Then, the part of the can shell wall located nearer to the opening 2 may be pressed in the direction of arrow 11, that is, in the direction in which it can be elongated in such a manner as to be pushed from the can shell wall inwardly toward the center of the can shell. An annular U-shape recess 12a may thus be formed (Fig. 2 (e)). When it is viewed from the side of the inner can shell wall, the annular U-shape recess 12a is the annular projection 12b (Fig. 2 (e)). Then, the annular projection 12b may be sandwiched between lower mold 13 and an upper mold 14, and may be pressed by the upper mold 14 against the lower mold 13 in the direction of arrow 15 (Fig. 2 (e)). An annular flange 3 may thus be obtained as an integral part of the inner can shell wall (Fig. 2 (f)). In this way, a metallic can 4 may be completed (Fig. 2 (f)).

[0022] As seen from Fig. 2 (a) to Fig. 2 (f), the annular flange 3 is formed like a double construction having upper and lower parts pressed tightly like the U shape.

[0023] The step of curling the peripheral margin 10 as described above may be performed, following me step of forming the annular flange 3.

[0024] Following the above described steps, if it is requested, a bottom plate 16 may be mounted to the bottom opening on the side opposite the side on which the opening 2 is provided, and this mounting may be performed in the conventional, usual manner. A can shell may be now finished according to the request.

[0025] Usually, the metallic can 4 obtained as described above may be used as follows. The peripheral margin of the separator film 5 (for example, aluminum foil) may be attached to the annular flange 3 of the metallic can 4 by adhesive or like. The separator film 5 covers the opening 2 of the can shell, sealing it or the content therein hermetically as shown in Fig. 3. Then, a cover 6 with an integrally formed scraper (for example, as described in the applicant's co-pending European patent application claiming priority from Japanese patent application no. 9-335913, the contents of which are incorporated herein by reference) or any other conventional cover may be mounted onto the opening 2 by pressing the cover upon the opening 2. A set of a can 4 with the separator film 5 attached to the annular flange 3, a cover 6 mounted on the can 4 and a bottom plate 16 is offered to the commercial market. A user of this set may use a metallic can 4 by putting a content into the can shell through the bottom open side opposite the opening 2, mounting the bottom plate 16 onto the bottom open end by curling, and keeping the content hermetic as shown in Fig. 3.

Claims

1. A metallic can (4) comprising:

   a can shell (1) having an opening (2) on one end thereof; and
   an annular flange (3) formed on the inner wall side of said can shell near said opening as an integral part of said can shell.

2. A method of manufacturing a metallic can (4) including a can shell (1) having an opening (2) on one end thereof and an annular flange (3) formed as an integral part of the can shell, the method comprising the steps of:

   reducing the diameter of the opening (2a) on one end of the can shell and at the same time elongating the area of the can shell (1) delimiting the opening outwardly in parallel with the axis of the can shell, for thereby providing a reduced diameter opening (2);
   pressing the part of the peripheral wall of the can shell located near said reduced diameter opening (2) inwardly of the can shell (1) and thereby forming an annular projection (12b) extending from the inner side wall of the can shell inwardly toward the center of the can shell (1); and
   flattening said annular projection (12b) by pressing it in the direction parallel with the axis of the can shell and thereby providing said annular flange (3) on the inner side wall as an integral part of the can shell.

3. The method as defined in Claim 2, wherein the peripheral margin of the area of the can shell (1) delimiting the reduced diameter opening is curled before the annular projection (12b) is formed or after the annular projection (12b) is formed.

FIG. 1

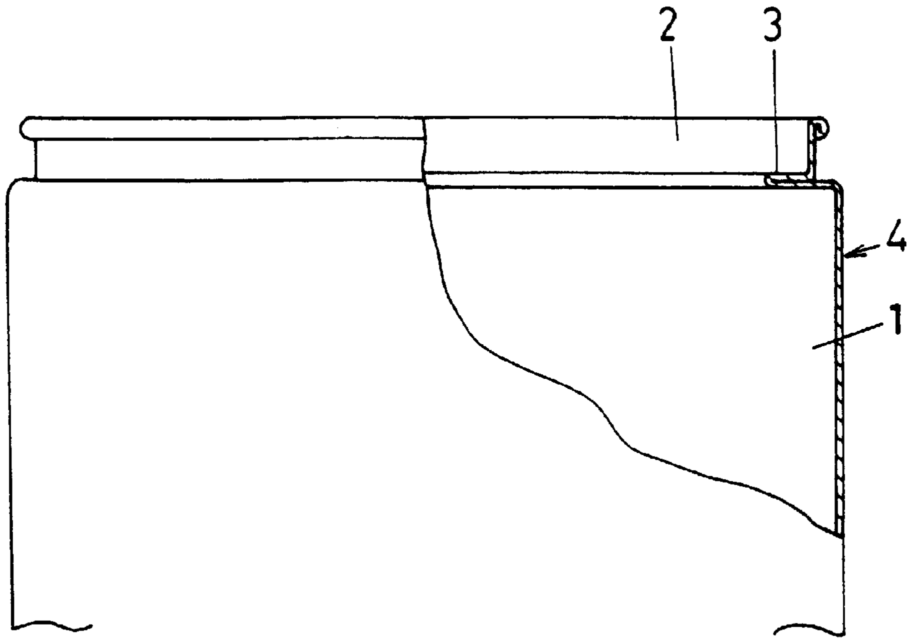
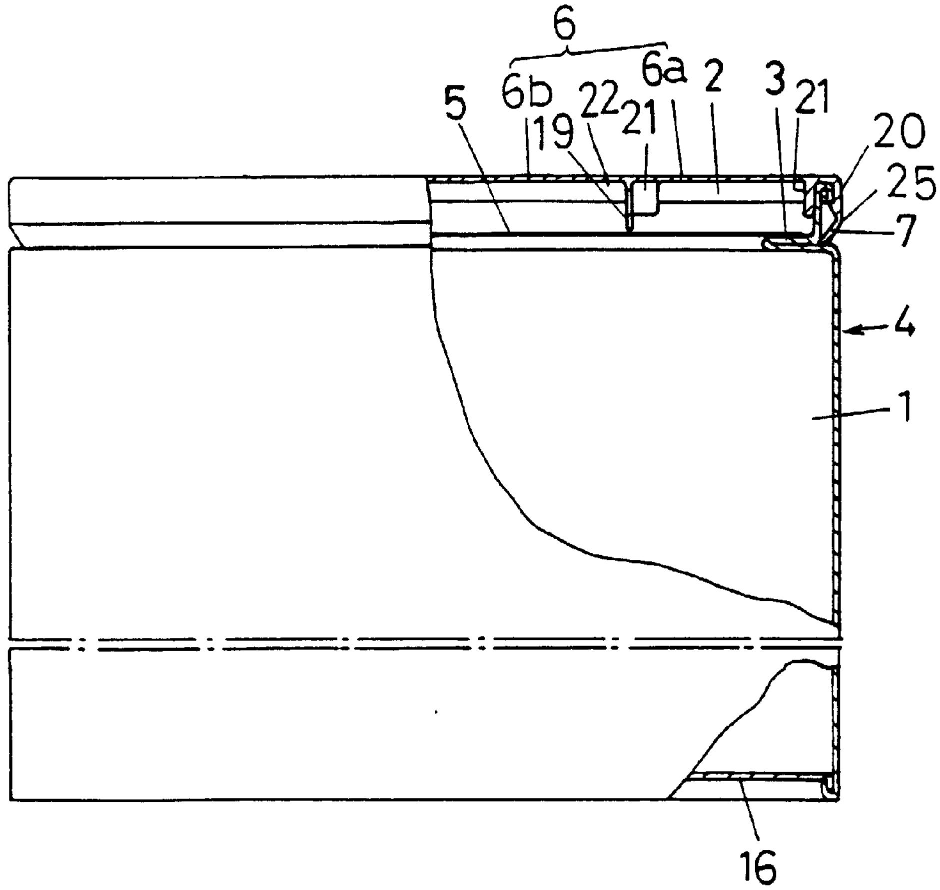


FIG. 3



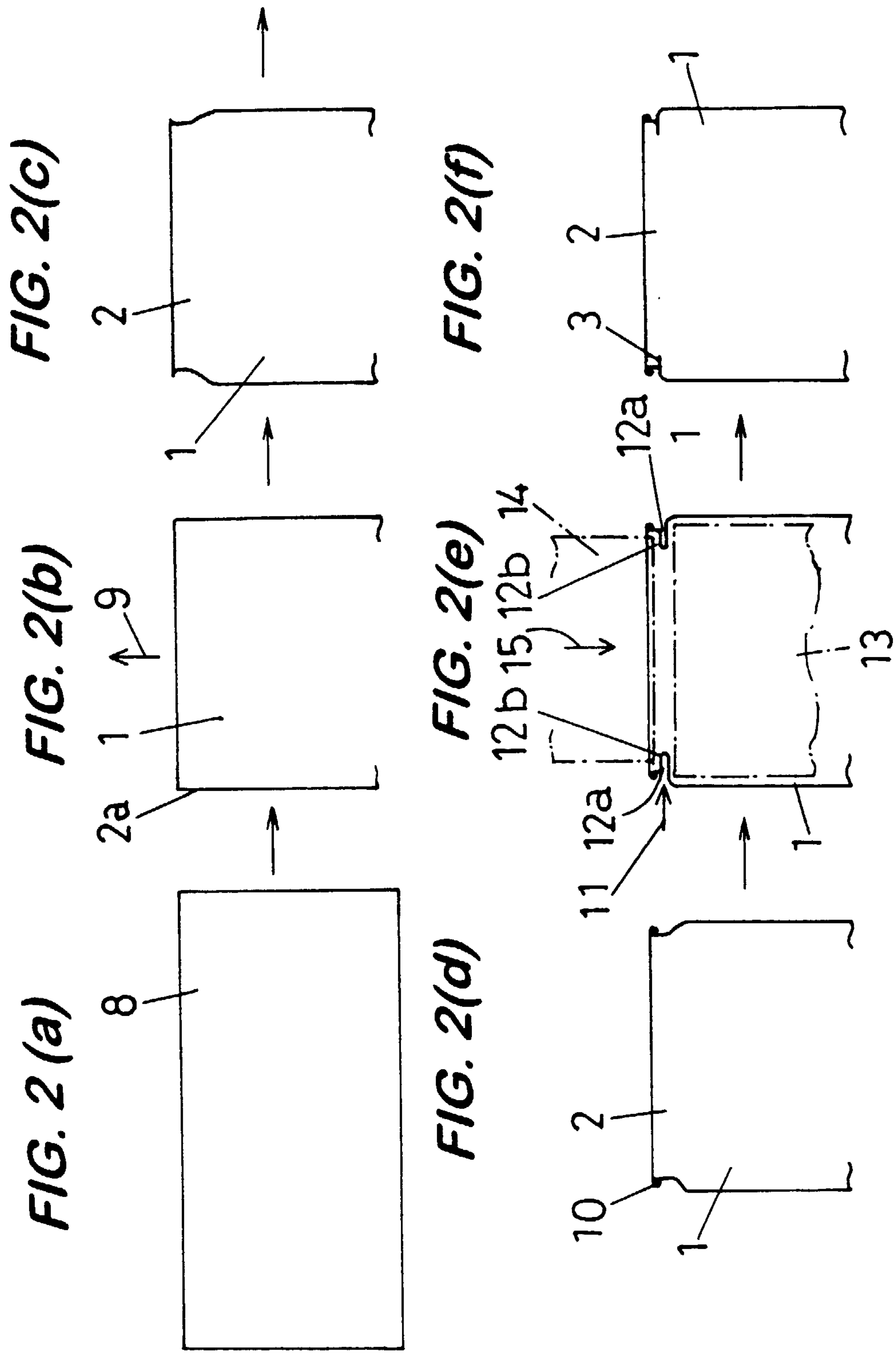


FIG. 2 (a)

FIG. 2(b)

FIG. 2(c)

FIG. 2(d)

FIG. 2(e)

FIG. 2(f)

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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 5031

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	FR 2 639 561 A (CARNAUD) 1 June 1990 * page 3, line 10 - page 6, line 9; figures 1-8 *	1-3	B65D8/04
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TECHNICAL FIELDS SEARCHED (Int.Cl.6)
B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10 March 1999	Martens, L

CATEGORY OF CITED DOCUMENTS

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