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

(11) Publication number : **0 645 313 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **94500148.5**

(22) Date of filing : **26.08.94**

(51) Int. Cl.[6] : **B65D 1/14,** B21D 51/26, B21D 39/02

(30) Priority : **09.09.93 ES 9302418 U**

(43) Date of publication of application : **29.03.95 Bulletin 95/13**

(84) Designated Contracting States : **FR GB**

(71) Applicant : **Rodriguez Campillo, Jose**
Francesc Macia 32
E-08915 Badalona (Barcelona) (ES)

(72) Inventor : **Rodriguez Campillo, Jose**
Francesc Macia 32
E-08915 Badalona (Barcelona) (ES)

(74) Representative : **Garcia Cabrerizo, Francisco**
OFICINA GARCIA CABRERIZO S.L.
Vitruvio 23
E-28006 Madrid (ES)

(54) Seam-folding system to compensate the bending of metallic containers.

(57) This invention refers to a seam-folding system to compensate the bending of metallic containers which can be applied during the manufacturing process applicable to all kind of metallic containers of a shape that can be either trunco-pyramidal, prismatic, elliptical or similar to correct the bending produced when the body of the container is expanded and specifically during the seam-folding operation to fix the bottom to the sides of the container. The hook of the ends or corners of the container is housed in the bottom hook with a slight difference in length between them while the hook of the intermediate areas of the container is considerably narrower than the bottom hook. The compensation of this difference in length is performed during the seam-folding operation.

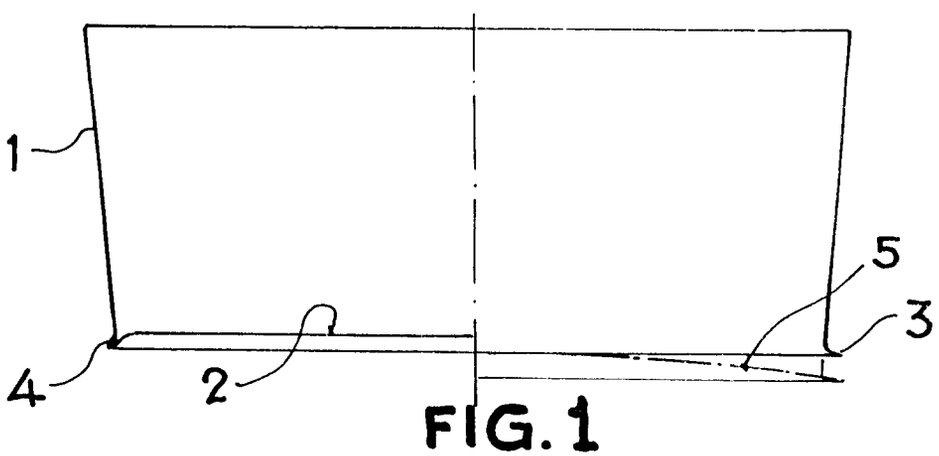

FIG. 1

EP 0 645 313 A2

The invention refers to a seam-folding system to compensate the bending of metallic containers the aim of which is to prevent the usual bending that normally appears in the metallic containers during the expansion operations carried out to obtaining or manufacturing such containers.

The seam-folding system to compensate the bending can be applied to all kind of metallic containers of a shape that can be either trunco-pyramidal, parallelopipedic, elliptical, etc.

As everybody knows, when the body of a metallic container is expanded, a deformation occurs due to stress of the material. Such deformation is called "bending" and happens in the bottom causing an uneven distribution of material in the periphery of the body of the container.

When the containers are manufactured it is necessary to correct such bending since such anomaly may lead to defective seam-folding when the joint between the bottom and the side area of the container is made through seam-folding which entails the subsequent risks of leakage due to a lack of water-tightness in certain containers.

The object of the invention is to absorb or compensate the differences in the length between the hooks at the corners and those intermediate ones produced during the seam-folding of the container and its bottom.

Currently the compensation can be achieved in accordance with the following three stages:

1. To cut the material with the periphery compensated before welding the body and its subsequent expansion.
2. To expand the body of the container with concave expanding tools so that they can proportionately compensate the subsequent deformation.
3. To cut the excess of the body of the container after its expansion.

The preconized seam-folding system to compensate the bending achieves that during the seam-folding operation the defect mentioned-above is corrected which, in turn, will save the operations 1 and 3 referred to above and which are prior to the seam-folding operation.

As far as operation 2 is concerned, it enables a more uniform and straight configuration of the container wall which, in turn, enables to better store such containers.

To complement this description and in an effort to better understand the main characteristics of the invention, a set of drawings is attached to this descriptive report forming an integral part of it and where, as an illustration and without limitation, the following has been represented:

Figure 1 shows a schematic view of the side of a container with one part seam-folded and the opposite one non-seam-folded. In this latter case the relevant bending can be noticed.

Figure 2 shows a plan view of a rectangular container with the seam-folding flange presenting different widths in the intermediate areas and in the corners.

Figure 3 shows in detail a section of a conventional seam-folding with no possibility of compensating the seam-folding since the hook and the loop where it is housed have the same length.

Figures 4 and 5 show section views of a compensating seam-folding made in accordance with the object of this invention.

In such figures, the numbering system correspond to the following parts and elements:

1. Container
1'. Conventional container
2. Bottom of the container (1)
2'. Bottom of the container (1')
3. Flanges
4. Seam-folding
5. Bending
6. Narrower areas of the flanges (3)
6'. Hooks of the areas (6)
7. Wider areas of the flanges (3)
7'. Hooks of the areas (7)
8. Maximum compression area
9. Stepped and corrugated area
10. Height or constant area for the housing of the hooks.

As it can be seen in figure 1, a metallic container (1) presents a bottom (2) and a perimetric flange (3) for seam-folding (4) purposes represented in another area of the same figure which also shows the bending (5) before the seam-folding.

In figure 2 it can be noticed, after carrying out the folding operation, the difference of material between the areas (6) and (7) corresponding to the flanges. After the seam-folding, such flanges become the respective hooks (6') and (7') which maintain the same length differences as those produced when the body (1) of the container was expanded.

Figures 4 and 5 show the sections of the compensating seam-folding according to the invention, while figure 3 shows the conventional seam-folding with no differences of length between its hooks, i.e. those which intervene in the seam-folding between such conventional container (1') and the relevant bottom (2').

Furthermore and in the case of figures 4 and 5, when the seam-folding operation is performed, the intention of the object of the invention is to compensate such difference exactly during such operation, the difference being absorbed inside the seam-folding itself. Thus, in the areas (7) presenting an excess of material such excess remains as shown in figure 5 while in the area (6) where there is less material such material stands as shown in figure 4 where the hook (6') does not totally overlap the hook of the bottom (2) and stands approximately at half the length of such

bottom. In figure 5, the hook (7') completely overlaps the bottom hook (2).

The configuration of the new seam-folding, according to figures 4 and 5, enables to reduce the height of the hook (6') by means of corrugations that shorten its length and, on the other hand, the hook (7') should be kept completely straight, compressed and compact to avoid that the bottom (2) is detached from the body (1) while keeping the referred water-tightness level.

To execute such compensating seam-folding it is necessary to use a mandrel and a series of rollers of a special configuration so that the mandrel should have an area for the maximum compression in the area (8) for the hook (6') and to make a compensating stepped and corrugated area (9) where the hook (7') will be shortened and housed in the area (10) with a constant height along its periphery.

Claims

1. Seam-folding system to compensate the bending of metallic containers which can be applied during the manufacturing process applicable to all kind of metallic containers of a shape that can be either trunco-pyramidal, prismatic, elliptical or similar to correct the usual bending produced when the body of the container is expanded and specifically during the seam-folding operation to fix the bottom to the sides of the container, essentially characterized because the hook of the ends or corners of the container is housed in the bottom hook with a slight difference in length between them while the hook of the intermediate areas of the container is considerably narrower than the bottom hook. The compensation of this difference in length is performed during the seam-folding operation.

2. Seam-folding system to compensate the bending of metallic containers according to claim 1, characterized because the seam-folding hooks present a straight area, compressed and compact, and a stepped and corrugated compensating area.

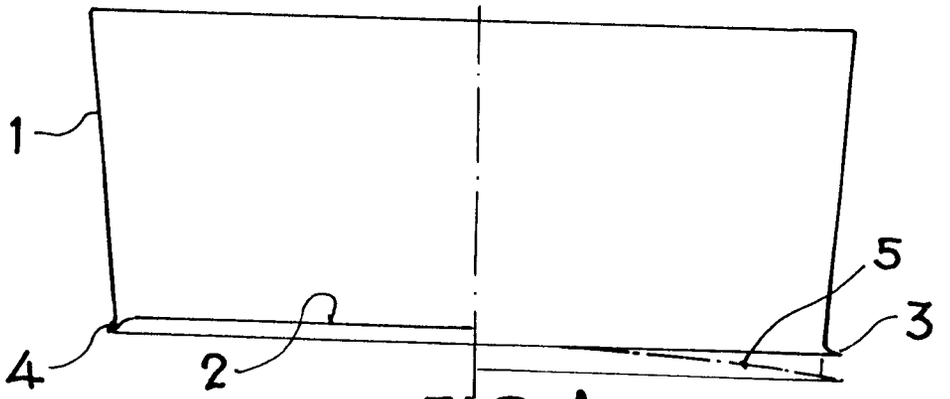

FIG. 1

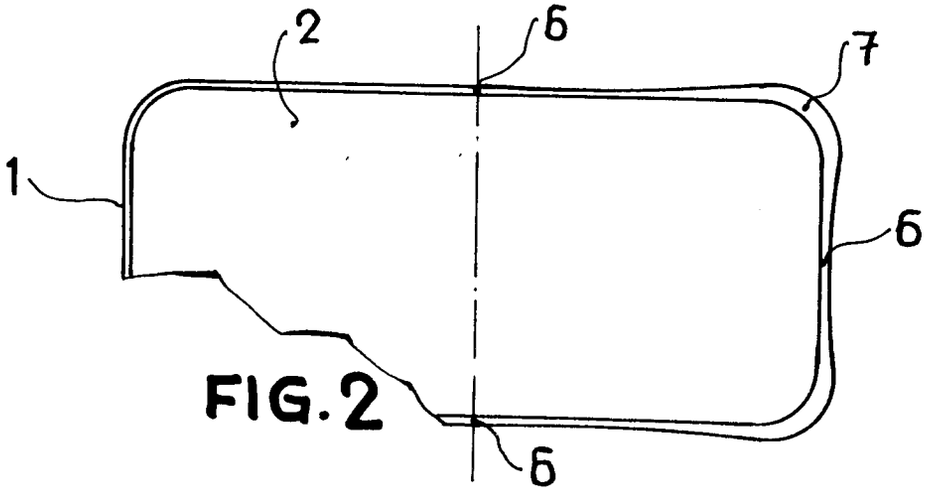

FIG. 2

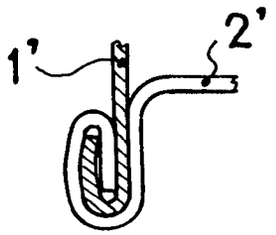

FIG. 3

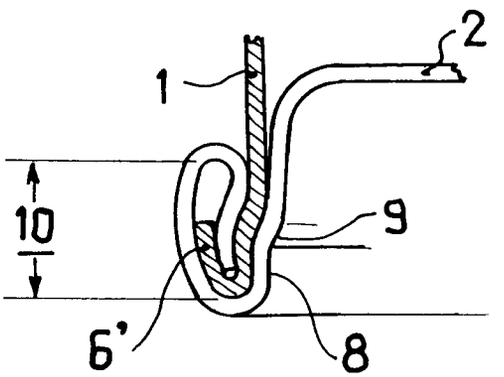

FIG. 4

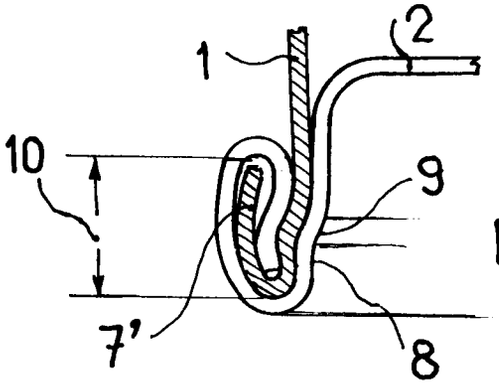

FIG. 5