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Stabilized, cubic, flexible container

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(56) Related Art
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Abstract

Stabilized, flexible, cubic container in which the stabilization is achieved by a continuous, tubular basic part which is provided with punched-out sections and is preferably in the form of a gusseted tube, of which the non-filled volume is provided in the corner regions with outer material adaptions, of which the inner, open edges are connected with sealing action to the basic part in an overlapping manner directly behind the punched-out sections.

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COMPLETE SPECIFICATION

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INVENTION TITLE:

Stabilized, cubic, flexible container

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

Various attempts have been made in the packaging industry to stabilize large-volume boxes, pliable-walled, i.e. semi-rigid, folding containers or foldable bulk containers (FIBC).

It is primarily the action of the side-wall surfaces bulging beyond their predetermined surface area which should be prevented. In particular in the case of outer packaging having compliant wall surfaces, it could be established that these did not withstand the pressure of free-flowing dry products.

It was possible to avoid said disadvantages to a sufficient extent in boxes by providing an octagonal insert.

In the case of flexible containers, usually produced from strong fabrics (FIBC), additional wall parts sewn in over the corners had an advantageous pressure-relieving effect. In many cases however, as a result of product protection, use is to be made of film liners which, with an inner chamber formation of the container, cannot be designed appropriately as far as the walls are concerned. It has thus been necessary in such cases to stabilize the film liner itself. The low wall thickness of films meant that only welding was considered for production purposes. The stabilization has been achieved by a round strap (inner ring) with a particular restraining force being welded in separately. You are referred to EP-A1-0 276 878 in this respect. In this method, an already preformed flexible liner has to be opened somehow in order to weld an inner ring to the insides of the film. This laborious, and not always reliable, adaption operation is indeed avoided by the production method given in US-A-5 618 255, because the strap and outer bag are first of all

connected in the open, flat state, but the subsequently necessary formation of a gusseted tube of a number of meters in width and length has proven to be obviously difficult. The concluding formation of the inlet and outlet stub requires separate production.

All the production methods which have been devised up until now for this purpose are thus extremely time-consuming and thus costly. In many cases, it is not possible to achieve the necessary strength for a weld seam for the event where the latter is subjected to tensile stressing.

In accordance with the invention, there is provided a stabilised, flexible container, comprising a continuous, seamless, tubular basic part, which is provided with punched-out sections with outer material adaptions, of which inner, open edges are connected with sealing action to the basic part in an overlapping manner directly behind the punched-out sections, wherein the tubular basic part is in the form of a gusseted tube and the punched-out sections are each arranged in a region of a gusset of the gusseted tube.

The material adaptions may be flat materials which are attached firmly to the basic tube and are connected with sealing action thereto, as is described in specific terms hereinbelow. In contrast to the previous or subsequent introduction of a stabilising strap, this type of construction achieves the stabilisation with the continuous inner tube as the starting point for production. This basic concept has the advantage that all other production steps can start on the outside of a seamless basic tube. A further advantage over other production methods lies in the avoidance of a large number of weak points, which may occur when a strap is welded in subsequently on the inside, for example tearing of the seams by tensile stressing with peeling action, weld faults and positional inaccuracies, as well as contamination by a tube being opened. In contrast, the stabilising column of the continuous basic tube according to the invention is not weakened by any inner seams. Shifts in position are not possible either, for the very reason that no strap is introduced. The inner surface of the basic tube is protected from contamination since the tube does not

have to be opened. Moreover, the outer material adaptions in the form of flat films or half-tubes ensure a low amount of particles for production. All the subsequently provided adaptions are attached to said basic tube from the outside.

The basic tube, which even as a gusseted tube constitutes a tubular element, has to have a sufficient number of suitable punched-out sections in order to ensure, during a later filling operation, friction-free material throughflow into the pocket-forming outer material adaptions. The same applies for the emptying operation.

In the next step, the film tube is provided, over the individual gussets, with material webs from the outside. These may be in the form of either 8 flat films or 4 half-tubes. Half-tubes are produced by a laterally slit film tube or by flat films folded congruently one above the other. A slight opening in the half-tubes allows in each case one side to be positioned above and beneath the film of the basic tube. This means that the outer material adaptions form outer pockets which, by means of an appropriate longitudinal weld over the entire length of the subsequent container, are connected to the basic tube, or the respective tube gusset, at the top and bottom in an overlapping manner directly behind the punched-out sections. These supplementary outer pockets then fill the corner area of subsequent container, insofar as this area cannot be reached by the inner, reduced-volume film tube. Indeed, this must not happen since it is only possible for a film tube to absorb the high pressure of the free-flowing contents when in this form as a film tube in the interior with much smaller dimensioning than the outer periphery of the container. The rest of the filling area in the corners is enclosed by the outer pockets formed and is subjected to considerably lower pressure there. If, instead of providing 4 half-tubes, use is made of 8 flat films, which later have to be welded closed at the still-open outer edges, the web guidance and the processing is particularly straightforward and reliable.

Finally, the basic tube, supplemented with outer material adaptions, in the form of a gusseted tube, is subjected, in the flat state, to a known contour-welding operation at the corners, a so-called bottleneck being formed as a result. This

bottleneck serves both as a filling stub and as an outlet stub and forms a unit with a tubular element, that is to say with the stabilizing basic tube.

It is primarily plastic films which are suitable materials to use here. However, it is also possible to use other materials (e.g. paper). A suitable connecting method to use in the case of plastics is preferably welding, but other connection methods using seams and adhesive bonding are also possible.

Containers which are stabilized in this way are suitable not just for large containers, but also for smaller containers if the contents thereof cause a change in shape as a result of the wall bulging. In many cases up until now it was only possible to avoid this bulging effect by using strong-walled outer packaging. It is now possible for the desired cubic package shape to be maintained even with just thin protective packaging.

The shaping of a stabilized inner sleeve is variable. Different side lengths are likewise possible, as are filling and outlet stubs of any desired shape. Correct dimensioning of the inner tube column can achieve very good stability, with the result that in this case, if appropriate, it is possible to dispense with outer packaging completely.

Further details and advantages of the invention can be gathered from the designs illustrated in the drawings, in which:

Figure 1 shows a plan view of a basic tube in the flat state with punched-out sections and outer material supplements;

Figure 2 shows a section, taken along section line A-B of Figure 1, through a basic tube, in the flat state, which in this case is in the form of a gusseted tube with material supplements in the form of half-tubes;

Figure 3 shows a section through a basic tube according to Figure 2 in the opened-out state along with a detail;

Figure 4 shows a section, taken along section line C-D of Figure 1, through the basic tube illustrated in Figure 2, said basic tube being in the flat state;

Figure 5 shows a basic tube according to Figure 4 in the opened-out state;

Figure 6 shows a section, taken along section line A-B of Figure 1, through a basic tube, in the flat state, which is in the form of a gusseted tube and has material supplements in the form of 8 flat films; and

Figure 7 shows an opened-out container with inlet and outlet stubs according to the invention.

In the production of the container according to the invention, a tubular structure 1, which is drawn off from a roll and is preferably a gusseted tube, is provided with lateral punched-out sections 2 which are supplemented by material adaptions 3. Supplementing is carried out such that the material web covers the punched-out sections to a sufficient extent (Figure 1). To aid understanding, this is illustrated specifically in the following Figures 2 and 4, with the aid of the section lines A-B and C-D of Figure 1.

When a gusseted tube 1 is used as the basic element, overlapping by material adaptions 3 in the form of flat films 3A or half-tubes 3B at the respective gussets is advantageous (Figure 2; Figure 6). The inwardly open ends of the half-tube have to be connected to the surface of the basic tube 1 from the outside. When flat films are used, these must additionally be closed at the outer edges. The type of material connection 4 and 4a depends on the web material selected. In the opened-out state, the tubular basic tube 1, along with the material adaption 3 connected to its outside, forms a square surface area in cross-section (Figure 3). The points of connection 4 are illustrated in a detail of Figure 3.

The position of the punched-out sections with the overlap is illustrated with the aid of the section line C-D in Figure 1. The section is shown in Figure 4. The points of connection to the outside of the basic tube 1 are to be understood as running throughout as a seam, with the result that the material adaptions 3, which form pockets in the folded-out state, can only be filled with, and emptied of, product via the punched-out sections. The product cannot emerge into the pocket-forming material adaptions 3 since the web ends are connected to the basic tube 1 by continuous seams 4 or, in the case of flat films 3A being used, are subsequently welded closed at the outer edges 4A. This is illustrated in Figure 6. Depending on the desired size and nature of the container, the start and end of a multi-layer material web produced in this way may open out into an inlet stub and outlet stub 6, 7 as is illustrated in Figure 7. These stubs form an integral part of the basic tube 1. The cubic nature of the container is particularly clear in this formation. The action of bulging beyond the square basic surface area is prevented by the basic tube 1 since the latter is restricted in diameter to the edge of the basic surface area. Most of the dynamic pressure of the contents is absorbed in this tube column. The rest of the contents are distributed, via the punched-out sections, into the outer pockets, which permit just negligible bulging. If such a container is placed in a flexible or pliable-walled outer container (e.g. FIBC or corrugated-cardboard box), the straight-walled surfaces of the latter delimit the cubic form completely.

The reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that that prior art forms part of the common general knowledge in Australia.

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Stabilized, flexible container, comprising a continuous, seamless, tubular basic part, which is provided with punched-out sections with outer material adaptions, of which inner, open edges are connected with sealing action to the basic part in an overlapping manner directly behind the punched-out sections, wherein the tubular basic part is in the form of a gusseted tube and the punched-out sections are each arranged in a region of a gusset of the gusseted tube.

2. Container according to Claim 1, wherein the outer adaptions form four pockets which are formed, by way of weldable adaptions, from eight flat webs which are connected with sealing action to the basic part at the inner, open edges and are additionally closed at the outer, open edges.

3. Container according to Claim 1, wherein the outer adaptions form four pockets which are formed, by way of weldable adaption, from four half-tubes which are connected with sealing action to the basic part at the inner, open edges.

4. Container according to Claim 1, 2 or 3, wherein the material of the tubular basic part is a plastic film, which is produced from the same material as the outer adaptions.

5. Container according to Claim 4, wherein the material of the tubular basic part is a special plastic film which is produced from at least two different materials (coextrusion film), one material exhibiting considerably less expansion than the other, and in that the material used for the outer layer of said basic part is the same as that used for the outer adaptions.

6. Container according to Claim 4, wherein the material of the tubular basic part is a plastic film which is produced from at least two different materials (coextrusion film), the inner layer of the tubular basic part having a considerably higher melting point than the outer layer, which consists of the

same material as the outer adaptions.

7. Container according to one of Claims 1 to 3, wherein a plastic fabric serves as the tubular basic part, and the four outer pocket-like adaptions are formed from an extruded plastic film.

8. Container according to Claim 1, wherein the material of the container is paper, and in that the basic part is connected to the outer pocket-like adaptions by adhesive bonding.

9. Container according to Claim 1, wherein the material used for the container is polypropylene fabric, and the basic part is connected to the outer pocket-like adaptions by being sewn thereon.

10. Container according to one of the preceding claims, wherein the inlet and outlet region forms a unit with the tubular basic part.

11. A container substantially as hereinbefore described with reference to the drawings.

DATED this 27th day of March, 2002

NITTEL HALLE GMBH

By DAVIES COLLISON CAVE
Patent Attorneys for the applicant

Fig 1

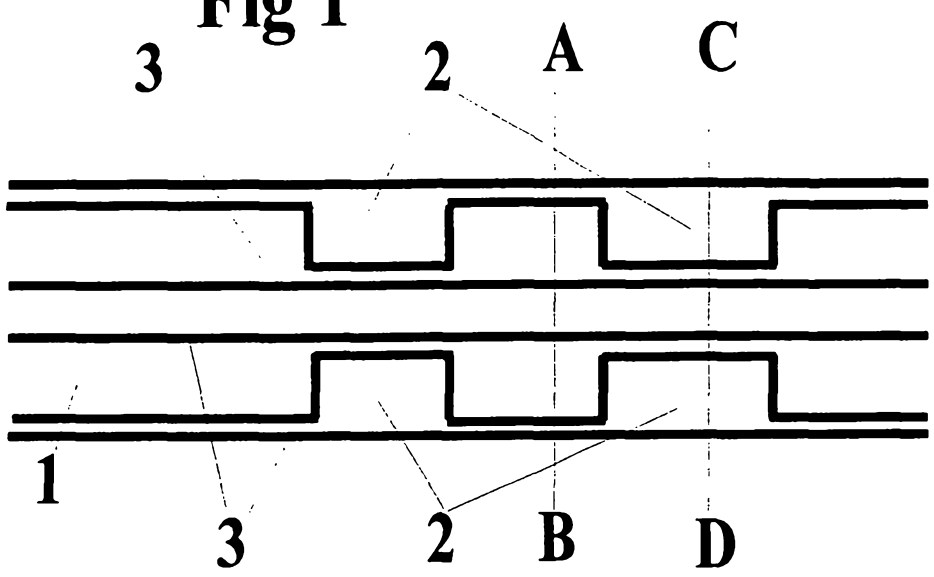

Fig 2

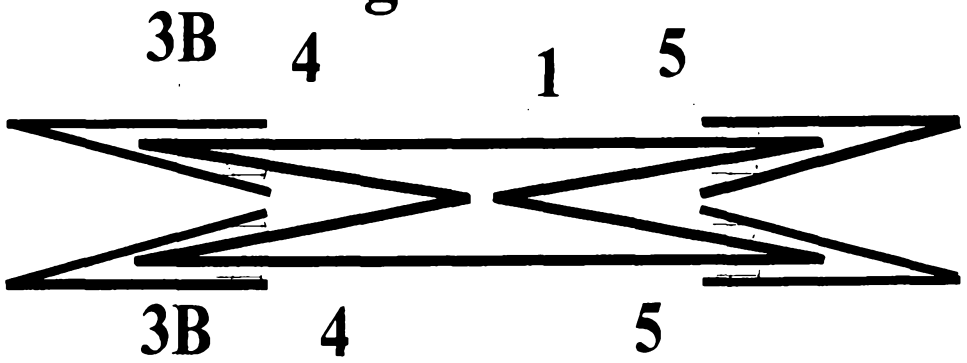

Fig 3

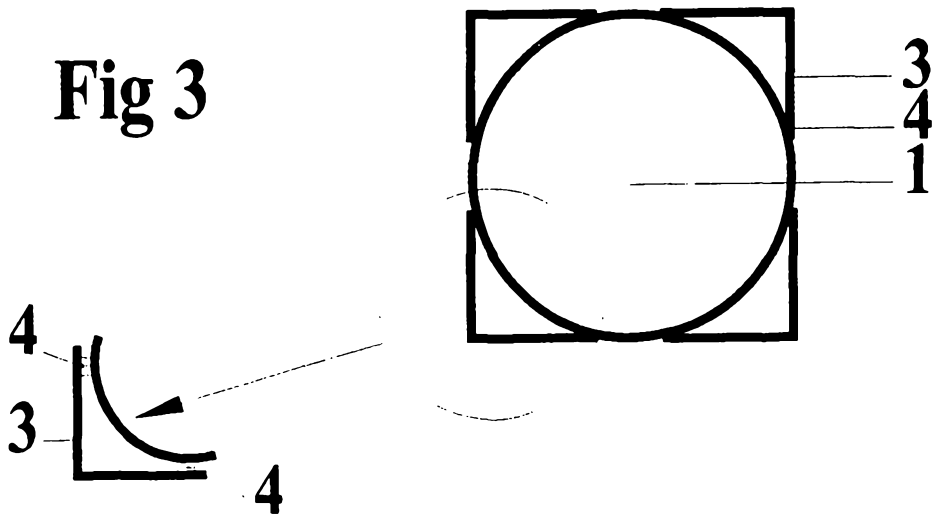

Fig 4

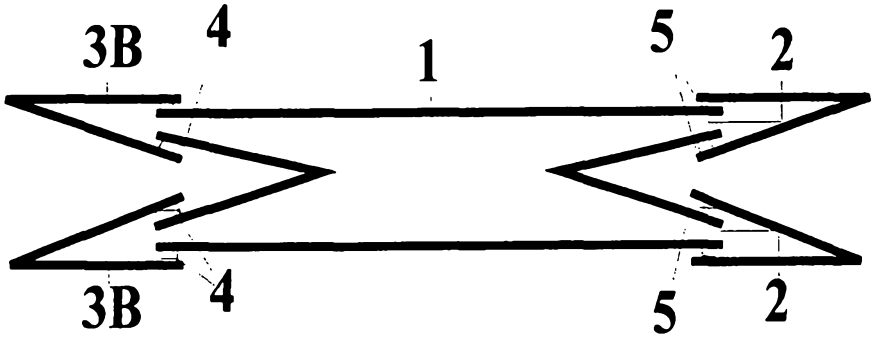

Fig 5

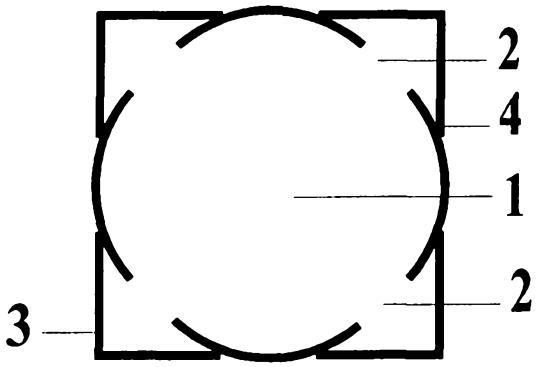

Fig 6

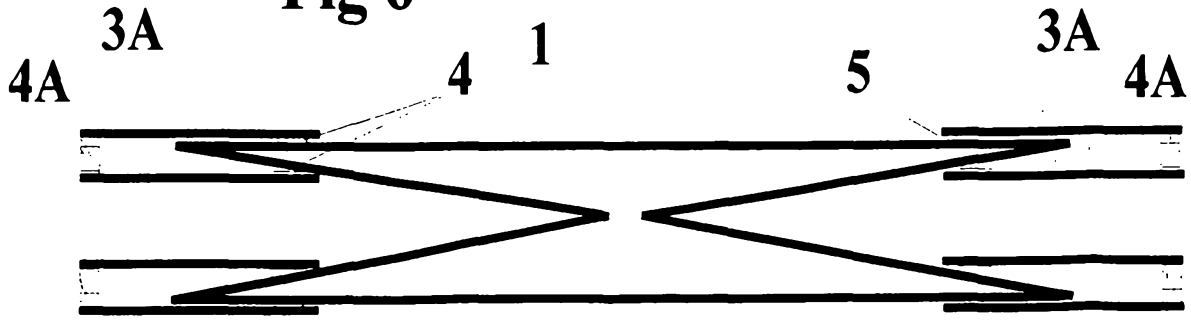

Fig 7