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- (54) Title:** CONTAINER FOR UNIT DOSE DETERGENT PACKAGES

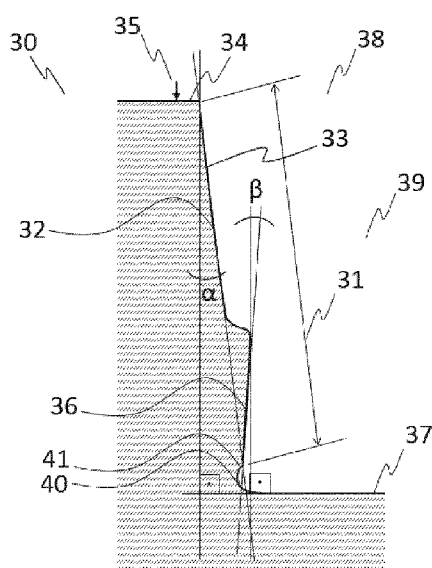


Fig. 3

- (57) Abstract:** The present invention concerns a container (1), for unit dose detergent packages (2), comprising a back panel (3), a front panel (4), and two side panels (5), each of the side panels (5), connecting the back panel (3) to the front panel (4); wherein the back panel (3), the front panel (4), and the two side panels (5) form a tub (6) with an inner storage volume, wherein the tub (6) is closed by a bottom panel (12) on bottom end (7) and comprises an opening on the top end (8) for allowing access to the container's interior (9). The container further comprises a hinged lid able to close the opening on the top end (8) when the lid is closed. The tub (6) is made by thermoforming a sheet of plastic material into a mold cavity (30) and the area defined by the opening on the top end (8) is larger than the area of the horizontal cross section at the bottom end (7). The back panel (3), the front panel (4), and the two side panels (5) are each translucent and an opaque label sleeve (20) surrounds the back panel (3), the front panel (4), and the two side panels (5), covering the most of, essentially all of, the outer surface of the panels (3, 4, 5).

„Container for unit dose detergent packages“

The present invention concerns a container for storing unit dose detergent packages.

Detergent compositions are known in different formats, liquid, powder or granulate, or unit (or unitary) dose packages such as tablets or caps. The unit dose detergent packages are convenient for the consumer, since they can be easily added to the house-hold cleaning apparatus without concern about dosage quantity because they already have sufficient dosage for one cleaning round.

The unit dose detergent packages are sold in outer packages such as doypacks or containers containing a multiple of unit dose packages. Such outer packages have a sufficient sized opening so that the consumer can take the unit dose packages out of the outer package, one at a time, and then reclose the outer package.

An example of a container for unit dose packages is described in WO2011/094685 A2. While the container described in that document tries to satisfy the requirements of sufficiently dimensioned opening and certain volume, it has the problem that the surface available for the label is relatively small while it is also positioned inwards of the front surface, therefore impairing the visibility and transmission of information to a consumer.

This problem is solved by a container according to claim 1. The dependent claims relate to further developments of the invention.

Further subjects of the invention are the thermoformed tub for the container, the sleeve, and the blank for the sleeve.

The invention is a container for unit dose detergent packages. The container comprises a back panel, a front panel, and two side panels. Each of the side panels connects the back panel to the front panel. Preferably, the side panels have essentially the same dimension. The back panel, the front panel, and the two side panels form a tub with an inner storage volume, wherein the tub is closed by a bottom panel on a bottom end and comprises an opening on the top end for allowing access to the container's interior, thus allowing unit dose detergent packages, to be taken out of the container. The container further comprises a hinged lid able to close the opening on the top end when the lid is closed. The tub is made by thermoforming a sheet of plastic material into a mold cavity. The area defined by the opening on the top end of the container(8) is larger than the area of the horizontal cross section at the bottom end. Further, back panel, the front panel, and the two

side panels are each translucent, and an opaque label sleeve surrounds the back panel, the front panel, and the two side panels, covering most of, essentially all of, the outer surface of the panels.

The area defined by the opening on the top end of the container means the area of the surface within the perimeter defined by the horizontal cross section at the interior of the tub and the addition of the wall thickness. Thus any additional lid frame supporting border or the like are excluded. The horizontal cross section at the bottom end means the area of the surface within the perimeter defined by the horizontal cross section at the exterior of the tub. In the case where the tub comprises a bottom proximal projection, then the outer most horizontal cross section area of the projection is to be taken for determining the area.

Translucid means that it allows light passing through, but it excludes transparency, meaning that an image cannot be recognized through the translucid panel. It is preferred that contact transparency can be achieved, especially when a liquid touches the translucid means, such as the bottom panel. This effect can be used to detect leakage of one of the unit dose detergent packages.

In one most preferred embodiment of the invention, the sheet of plastic used for thermoforming the tub, is, before the thermoforming process, a non-transparent sheet with homogeneous thickness. Preferably, the term sheet means a sheet or the part of it before the thermoforming process, which is comprised by the tub after the thermoforming process.

It is preferred that the thickness of at least one, preferably all, of: the back panel, the front panel, the two side panels, is between 0.1 and 0.8 mm. The thickness of the bottom panel is preferably between 0.1 and 0.8 mm. The edges and corners may have larger thickness, these elements which can have larger thickness are however a minority of the surface, preferably less than 5% of the total surface of the panels.

The lid is a hinged lid, preferably comprising a frame and a movable cover. The frame is preferably mechanically fixed to the tub. Preferably, the lid is injection molded.

The terms top end, upper end, upper side, all refer to the side that corresponds to the opening (also called the mouth) of the container.

#### Label Sleeve

The flexural module of the label sleeve is preferably greater than the flexural module of the tub, when measured under same conditions and at the same respective sections of the front panel or back panel (flexural module relation). That means, one section of the label sleeve corresponding to one of the panels has a greater flexural module than the corresponding panel. For the measurements, a flat piece of the panel and label are compared. For the purpose of the

experiment, flat, means free of any fold, edge, or border, if a panel is subdivided (see further below), then the test sample should be taken from the main panel section instead of the secondary panel section. For the measurement, ideally a non-curved panel and label sleeve are used, if such is not available, then the less curved parts are used, and the curvature is convex towards the loading nose. Preferably, the flexural module relation holds true for all of: the back panel, the front panel, and the two side panels. Other elements of the label sleeve, such as folds, tear strips, or edges, and if available, corresponding tub elements, are not required to have the aforementioned flexural module relation. As standard such as ASTM D 790 can be used for the comparative test.

Preferably, the label sleeve is made of recyclable material. The preferred material is paperboard.

The label sleeve comprises sections that correspond to the panels of the tub. The front section corresponds to the front panel, the back section corresponds to the back panel. The side sections correspond to the side panels. The front section and the back sections are preferably flat. The sleeve is also closed (tub like), and is preferably formed from a blank. In one preferred variant, the sleeve is closed by gluing the tabs, preferably at a side section. The sleeve may comprise edge compensation segments, for rounded edges. Alternatively or in addition, the sleeve preferably comprises taper compensation segments, these are preferably at the borders between the sections, and compensate for the fact that the tub tapers towards the bottom, therefore the sleeve adapts well to the external shape of the tub. The taper compensation segments are tapered towards the bottom side.

The label sleeve preferably comprises a tear assistance, so that it can be easily removed to facilitate material separation, such as for recycling. Examples of tear assistance are tear strip, a weakened line, or examples thereof. The tear assistance is preferably at one of the side sections.

## Mold

It has been found that thermoforming a plastic sheet into the tub has surprising advantages in relation to other methods, such as blow molding or injection molding. There are significant material savings. While the material saving decreases the stability it has been found that using the label sleeve the required or even greater stability is obtained. Substantial stacking stability is obtained. It was also found that with the inventive sleeve the container is better gripable, thus can be held by hand without extreme deformation.

The container preferably further comprises means for holding the sleeve in position relative to the tub. An example of such means are glue or a ledge. Preferably, such holding means comprises a ledge of a projection of the panel. The ledge cooperates with the sleeve, such that the sleeve can be held in position on the ledge. The ledge is bottom sided at least at one, preferably at all of: the back panel, the front panel, the two side panels. Preferably, the ledge is proximal to the container.

Preferably, the ledge surrounds the container. The ledge may be continuous or comprise interruptions, but is preferably continuous, this offers a larger contact surface between the ledge and the sleeve thus improving the overall stability of the container.

The mold comprises a bottom that corresponds to the bottom panel of the container. The mold further comprises four lateral walls that correspond to the back panel, the front panel, and the two side panels of the container.

The mold comprises means for evacuating the gas in the cavity during the thermoforming process, preferably in form of openings connected to a vacuum system

According to the invention, the mold has a lateral curved recess that is proximal to the bottom, so that the tub thermoformed in said mold comprises a respective projection that is proximal to the bottom panel, the projection comprises the ledge, thus functioning as means for holding the sleeve in position. The recess of the mold and the corresponding projection in the tub have a minimum height of 1 mm and up to 10 mm, preferably up to 5 mm, further preferably up to 3 mm. Between 1 and 3 mm, a certain rigidity is obtained improving the stacking stability of the container. Preferably, the recess and the projection are arced, this facilitates the demolding.

The recess and the corresponding projection are preferably forming a line surrounding and within the mold's cavity and surrounding the container.

The mold preferably comprises vacuum openings in the recess. It was found out that this improves the quality, especially the aspect ratio, of the aforementioned recess according to the present invention. Preferably, the openings are spaced apart at a distance between 4 mm and 25 mm. Preferably, these openings are aligned when the recess is a line.

The container is tapered towards the bottom. To achieve this, at least on one lateral wall of the mold, preferably on all lateral walls, the remaining lateral wall section between the recess and the end corresponding to the top end of the container, comprises a main wall section. The main wall section is inclined towards the bottom and the interior of the cavity. Preferably, the mold further comprises a secondary wall section between the recess and the main wall section. The secondary wall section is preferably inclined towards the end corresponding to the top end of the container and the interior of the cavity. In a preferred embodiment, in which all four walls have the aforementioned properties of the main wall section and the secondary wall section, the corresponding tub will in fact be tapered away from the bottom panel, in the secondary panel section (corresponding to the secondary wall section), and also tapered towards the bottom panel in the main panel section (corresponding to the main wall section), while the container overall is still tapered towards the bottom panel when considering the area defined by the opening on the top end and the area of the horizontal cross section at the bottom end.

The thermoforming process according to the invention comprises at least one-step of forming a sheet to the mold with application of pressure difference between the two sides of the sheet, such that the lower pressure is in between the sheet and the mold. Preferably by application of vacuum.

An exemplary preferred thermoforming process comprises the steps of:

- providing a sheet, preferably by extruding of sheet;
- heating the sheet, conditioning it to a suitable working temperature;
- preferably using a plug to pre-stretch the sheet into the mold;
- molding the sheet into the mold with pressure difference, preferably vacuum;
- demolding, preferably with air pressure and/or spring assisted ejection;

these steps are preferably performed in the order as written above, intermediate steps may be present.

#### Curved panel

In a further development of the invention, it was found that that if the container has a curved front panel, it provides a better visibility to a consumer observing the container. The embodiment with all features described within this section can be combined by the skilled, in the art exercising the present invention, with the remaining description of the invention. Preferably, the front panel is curved outwardly of the tub for increasing the label surface, such that its outer surface is at least 5% larger than the surface of the panel if it were planar. Thus, in this embodiment, the front panel is outwardly convex. The back panel is, and optionally also the side panels are, each less outwardly convex than the front panel.

Preferably, the front label is curved outwardly of the tub for increasing the label surface, such that its outer surface is at least 5% larger than the surface of the front label if it were planar. For this purpose, the area of the front label includes the area of the compensation segments between front label and the adjacent sides of the sleeve. Thus, in this embodiment, the front label is outwardly convex. The back label is, and optionally also the side labels are, each less outwardly convex than the front label.

The back panel is preferably arranged with a right angle to each of the side panels. Right angle means  $90^\circ \pm 3^\circ$ . In addition, the edges between any two neighboring panels can be rounded, thus giving a more comfortable hold of the container when held by a person's hand.

The back panel is preferably essentially flat. Alternatively or in addition, the side panels are preferably essentially flat. When the panels are flat, especially the side panels, the container has an improved stability within a tray of containers. If the panels are divided in main and secondary

panel sections as described above, then essentially flat, means that each section is essentially flat, for the purpose of the present invention.

The area of the front surface of the front panel is at least 10% greater, preferably at least 20% greater, than the area of the back surface. The front surface of the front panel is the surface facing outwards the tub. The back surface is also the surface of the back panel facing outwards the tub. With facing outwards, it is meant facing away from the interior.

The area of the front surface of the front label is at least 10% greater, preferably at least 20% greater, than the area of the back label. The front surface of the front label is the surface facing away from the tub panel. The back surface is also the surface of the back label facing away from the tub panel.

The increased front surface of the front panel has the advantage of providing enough surface area for a label with increased surface. Further, it was found that the outwardly convexity of the front label increases the perception of a viewer of graphic elements on the label's surface. Thus, a container according to the invention, and its information, can be easier identified by a consumer. It was found advantageous, that a flat back label, is better for printing larger amount of text, such as more detailed information about the product. The flatness increases readability of such larger amount of text. Larger amount of text means at least 3 times more, preferably 10 times more, characters than in the front label.

The container according to the invention preferably has an inner storage volume that is between 260ml and 5000ml, more preferably between 650ml and 3500ml. Thus, the storage volume can contain at least 4 dosing units.

Preferably, the container according to the invention is elongated between the side panels, preferably the ratio ( $d/L$ ) between the longest diagonal ( $d$ ) at the bottom panel and the length ( $L$ ) of the back panel is between 1.01 and 1.11. The elongation, and especially the  $d/L$  ratio, gives a high ratio of area of the front label surface per storage volume.

Preferably, the shortest distance from a point on the back panel to the front panel is at some point at least 1.1 times and not more than 1.6 times the shortest distance, adjacent to the side panel, between the back and front panel, further preferably at least 1.2 and not more than 1.5. The front panel is bulging out, thus increasing the angular visibility of a label on its surface.

In a preferred embodiment of the invention, the arrangement of the back panel, the front panel, the two side panels, and the bottom panel has a reflection symmetry, about the plane that is equidistant from the side panels. This enables a consumer to observe an equal area of the label

surface independently from which side the consumer approaches the container from the side, when the container is e.g. on a shelf.

The elongated format of the container has the additional advantages of providing larger surfaces for the back label, while having a more ergonomic shape, since it can be better gripped with a hand.

The unit dose packages are to be used preferably in house-hold cleaning apparatuses. Preferably, the unit doses packages are to be used in dishwasher and laundry machine, further preferably in laundry machine. It is preferred that the container comprises at least 4 unit dose packages. It is preferred that the unit dose packages comprise at least one chamber containing a liquid detergent, preferably a colored liquid detergent.

Outwardly means from the container's interior to the outside. A person looking to the front panel, of the container without the label sleeve, from the outside will be looking at the convex surface of the front panel. A person looking to the front label from the outside will be looking at the convex surface of the front label.

The bottom panel has a respective shape to connect to the front panel. The perimeter segment defined by the transition between the bottom panel to the front panel is longer than the perimeter segment defined by the transition from the bottom panel to the back panel.

Further developments of the invention

The label preferably comprises an identification marker.

An identification marker according to the invention comprises machine-readable information. Machine-readable information has a code created specifically to be read by machines (thus natural languages are excluded). In one preferred further development of the invention, the machine-readable information is coded in form of a bar code, such as a one-dimensional bar code, or a two dimensional bar code, e.g. a QR-code. Alternatively or in addition, in another further development of the invention, the machine-readable information is coded such that it is electronically readable, such as from an electronic remotely sensed multi-bit communication tag, for example an RFID tag or an NFC tag. The information stored in the identification marker has a binary-equivalent content size of at least 8 bits, although the information itself does not have to be stored and or transmitted in a binary format. The identification marker can further comprise human readable language, for example "scan here".

In one mode of the invention, the identification marker is integral to the label, preferably as mark printed on the label surface. This has the advantage of faster production, since the identification marker can be printed with the label-printing step that also prints other indicia.

In another mode of the invention, the identification marker was added to the label, e.g. a sticker. This is especially advantageous when the sticker comprises an electronic tag, because the tag comes from a different manufacturing process and is then easily added to the label.

#### Summary of the Figures

Fig. 1 shows a schematic drawing of a container according to the invention.

Fig. 2 shows preferred sleeve blank for a sleeve according to the invention.

Fig. 3 shows a partial vertical cross sectional view of the mold.

## Figures

An embodiment of the invention is shown in Figure 1, which is a schematic drawing of the container. Fig. 1 shows a container 1, for unit dose detergent packages 2, comprising a back panel 3, a front panel 4, and two side panels 5. The side panels 5, are connecting the back panel 3 to the front panel 4. The back panel 3, the front panel 4, and the two side panels 5 form a tub 6 with an inner storage volume. Tub 6 is closed by a bottom panel 12 on bottom end 7 and comprises an opening on the top end 8 for allowing access to the container's interior 9. This embodiment shows the further development of the invention in which the front panel 4 is outwardly convex, however this feature is not necessary for all variations of the invention. The side panels 5, the back panel 3 and the bottom panel 12 are essentially flat. The container 1 is shown storing unit dose detergent packages 2 in its interior 9. The tub 6 is made by thermoforming a sheet of plastic material into a mold cavity 30. The area defined by the opening on the top end 8 is larger than the area of the horizontal cross section at the bottom end 7.

The container 1 further comprises a sleeve 20, which blank is shown in figure 2. The sleeve and a hinged lid able to close the opening on the top end 8 when the lid is closed, are absent in figure 1, to simplify the visualization of the figure.

A blank for the sleeve label is shown in figure 2. The following description is valid for the blank and for the sleeve as well. The side 25 (25.1, 25.2) is formed by gluing the 25.1 on top of gluing tab 25.2, thus closing the sleeve. The sleeve comprises a front label 24 and a back label 23, and two sides 25, 26, each side connecting the front label 24 to the back label 23, when the blank is closed to a sleeve. At the edges, there are edge and/or taper compensation segments 22. In the preferred embodiment, these segments 22 are provided between side 25 (tab 25.2 for the blank) and back 23, between back 23 and side 26, between side 26 and front 24, and between front 24 and side 25 (tab 25.1 for the blank). The sleeve preferably comprises a tear assistance 29, which is preferably at one of the sides 25, 26, most preferably at the side 26. The edge and/or taper compensation segments 22 are preferably edge and taper compensation segments, thus they compensate for the tapered form of the tub when added to the tub, such that the front 24 and the back 23 each have essentially parallel borders at the upper side 28 and bottom side 27, preferably the sides 25, 26 also each have essentially parallel borders at the upper side 28 and bottom side 27. In such case, when the blank is closed into the sleeve, the upper borders of the front 24 and front 23 are in the same plane and the bottom sided borders of the front 24 and front 23 are also in the same plane. The same applies to the borders of the sides 25, 26 in the preferred case.

Figure 3 shows a partial vertical cross sectional view of the mold 30 with a cavity having interior 39, and open end 38. Only one cavity wall (33) and bottom (37) can be seen, but it is preferred that the described features are realized in at least the front and back walls, preferably in all four walls. The mold 30 comprises a bottom 37 that corresponds to the bottom panel 12 of the container 1 (and tub

6). The mold 30 further comprises four lateral walls (only 33 is shown) that correspond to the back panel 3, the front panel 4, and the two side panels 5, 6 of the container 1. The mold 30 comprises means for evacuating the gas in the cavity during the thermoforming process, preferably in form of openings connected to a vacuum system (not shown). The tub of the container has a border for fixating the lid, this border is exemplarily made at the element 34 on the mold 30, and cut at the cut mark 35. This border is not taken into consideration for the measurements of the cross section.

According to the invention, the mold 30 has a lateral curved recess 40 that is proximal to the bottom 37, so that the tub thermoformed in the mold 30 comprises a respective projection (to the recess 40), wherein the recess 40 (and projection in the tub panel) is proximal to the bottom 37 (and bottom panel 7 respectively). The projection in the tub comprises a ledge (corresponding to the mold 30 feature 41). The ledge functions as means for holding the sleeve 20 in position. The sleeve 20 with height 21 sits on the ledge (corresponding to feature 21 in Fig. 3). It can be seen in figure 3 a label recess with height 31 for receiving the label 20. Preferably, the label 20 is held in position to the tub on the upper side by the border formed at 34. The recess 40 of the mold 30 and the corresponding projection in the tub 1 have a minimum height of 1 mm and up to 10 mm, preferably up to 5 mm, further preferably up to 3 mm. Preferably, the recess 40 and thus the projection are arced as shown in figure 3, facilitating the demolding.

The mold preferably comprises vacuum openings (not shown) in the recess 40. These openings have a preferred vertical position in the center of the arc. Preferably, the openings are spaced apart at a distance between 4 mm and 25 mm, in regards to the horizontal position. Preferably, these openings are aligned when the recess 40 is a line.

The container is tapered towards the bottom. To achieve this, at least on one lateral wall 33 of the mold 30, preferably on all lateral walls, the remaining lateral wall section between the recess 40 and the end corresponding to the top end 8 of the container 1, comprises a main wall section 32. The main wall section 32 is inclined towards the bottom 37 and the interior 39 of the cavity of the mold. Figure 3 shows exemplarily the inclination of the main section 32, in relation to the vertical, with an angle  $\alpha$ . Preferably, the mold 30 further comprises a secondary wall section 36 between the recess 40 and the main wall section 32. The secondary wall section is preferably inclined towards the end corresponding to top 38 (corresponding to the top end 8 of the container 1) and the interior 39 of the cavity. Figure 3 shows exemplarily the inclination of the secondary section 36, in relation to the vertical, with an angle  $\beta$ . Thus, in the preferred embodiment, in which all four walls have the aforementioned properties of the main wall section 32 and the secondary wall section 36, the corresponding tub will in fact be tapered in the direction *away* from the bottom panel 12 in the secondary panel section (corresponding to the secondary wall section 36), and also tapered in the direction *towards* the bottom panel in the main panel section (corresponding to the main wall section 32), while the tub and the container overall is still tapered towards the bottom panel 12 when considering the area defined by the opening on the top end 8 and the area of the horizontal cross section at the bottom end 7.

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## Claims

1. A container (1), for unit dose detergent packages (2), comprising a back panel (3), a front panel (4), and two side panels (5), each of the side panels (5), connecting the back panel (3) to the front panel (4); wherein the back panel (3), the front panel (4), and the two side panels (5) form a tub (6) with an inner storage volume, wherein the tub (6) is closed by a bottom panel (12) on a bottom end (7) and comprises an opening on the top end (8) for allowing access to the container's interior (9); further comprising a hinged lid able to close the opening on the top end (8) when the lid is closed; wherein the tub (6) is made by thermoforming a sheet of plastic material into a mold cavity (30); further characterized in that the area defined by the opening on the top end (8) is larger than the area of the horizontal cross section at the bottom end (7); wherein the back panel (3), the front panel (4), and the two side panels (5) are each translucent; and wherein an opaque label sleeve (20) surrounds the back panel (3), the front panel (4), and the two side panels (5), covering the most of, essentially all of, the outer surface of the panels (3, 4, 5).
2. A container (1) according to claim 1, wherein the thickness of at least one, preferably all, of the back panel (3), the front panel (4), the two side panels (5), and the bottom panel (12), is between 0.1 and 0.8 mm.
3. A container (1) according to any of the claims 1 or 2, further comprising means for holding the sleeve in position relative to the tub.
4. A container (1) according to any of the previous claims, wherein the flexural module of the label sleeve (20) is greater than the flexural module of the tub (6), when measured under same conditions and at the same respective sections of the front panel (4) or back panel (3).
5. A container (1) according to any of previous claims, wherein the label sleeve (20) is made of recyclable material.
6. A container (1) according to any of the previous claims, wherein the label sleeve (20) has a tear assistance, so that it can be easily removed to facilitate material separation, such as for recycling.
7. A container (1) according to any of the previous claims, wherein the mold (30) has a lateral curved recess (40) that is proximal to the bottom (37), so that the container (1) thermoformed in said mold (30) comprises a respective projection that is proximal to the bottom panel (12), the projection having a ledge (41) functioning as means for holding the sleeve (20) in position.
8. A container (1) according to any of the previous claims, wherein the mold (30) comprises vacuum openings in the recess (40).
9. A container (1) according to claim 8, wherein the openings are spaced apart at a distance between 4 mm and 25 mm.

10. A container (1) according to any of the previous claims 7 to 9, wherein at least on one cavity wall the remaining lateral wall (31) between the recess (40) and the end corresponding to the top end (8) of the tub, comprises a main wall section (32) that is inclined towards the bottom (37) and the interior of the cavity (39).

11. A container (1) according to claim 10, further comprising a secondary wall section (36) between the recess (40) and the main wall section (32), and wherein the secondary wall is preferably inclined towards the end corresponding to the top end (8) of the tub and the interior of the cavity (39).

12. A container (1) according to any of the previous claims, wherein the front panel (4) is outwardly convex, and wherein the back panel (3) is, and optionally also the side panels (5) are, each less outwardly convex than the front panel (4);

13. A container (1) according to any of the previous claims, wherein the back panel (3) is, and optionally also the side panels (5) are, essentially flat.

14. A container (1) according to any of the previous claims, wherein the area of the front surface (10) of the front panel (4) is at least 10% greater, preferably at least 20% greater, than the area of the back surface (11) of the back panel (3).

15. A container (1) according to any of the previous claims, wherein the inner storage volume is between 260ml and 5000ml, more preferably between 650ml and 3500ml.

16. A container (1) according to any of the previous claims, wherein the container (1) is elongated between the side panels(5), preferably the ratio ( $d/L$ ) between the longest diagonal ( $d$ ) at the bottom panel (12) and the length ( $L$ ) of the back panel (3) is between 1.01 and 1.11.

## Figures

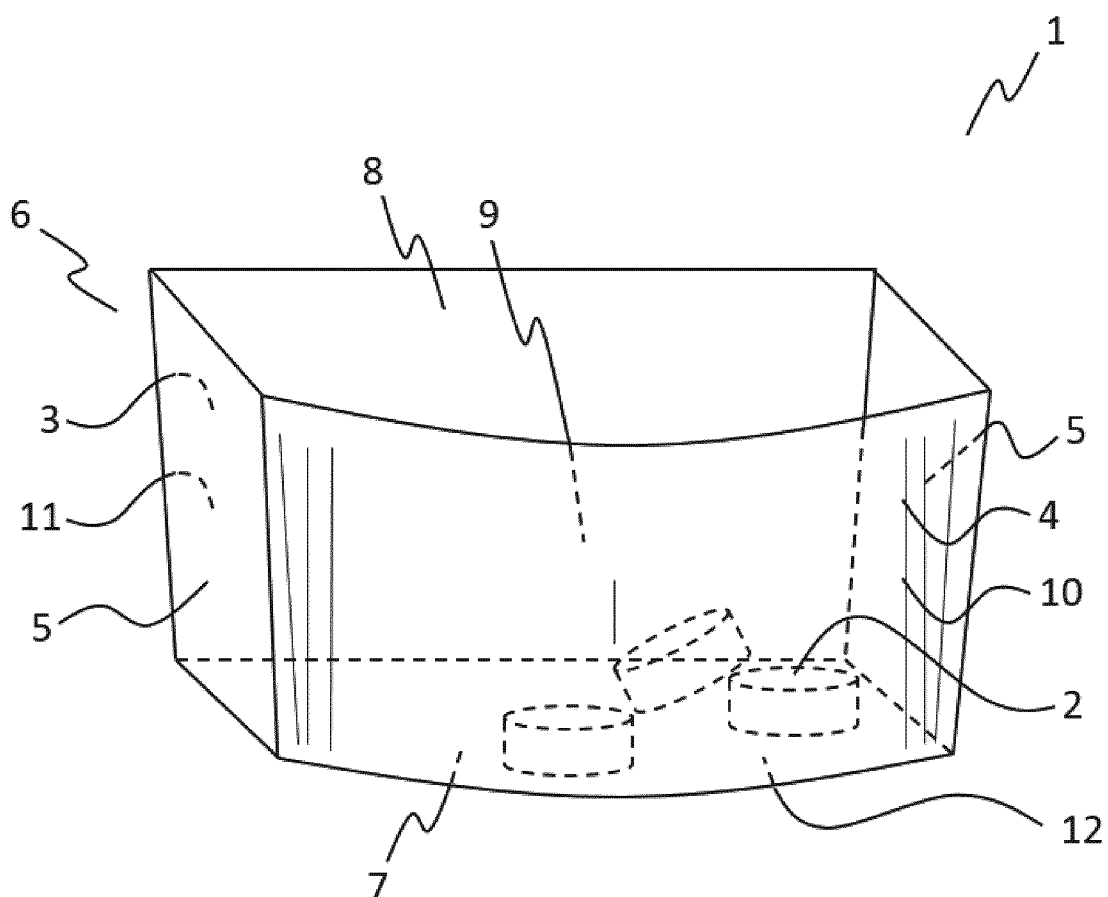


Fig. 1

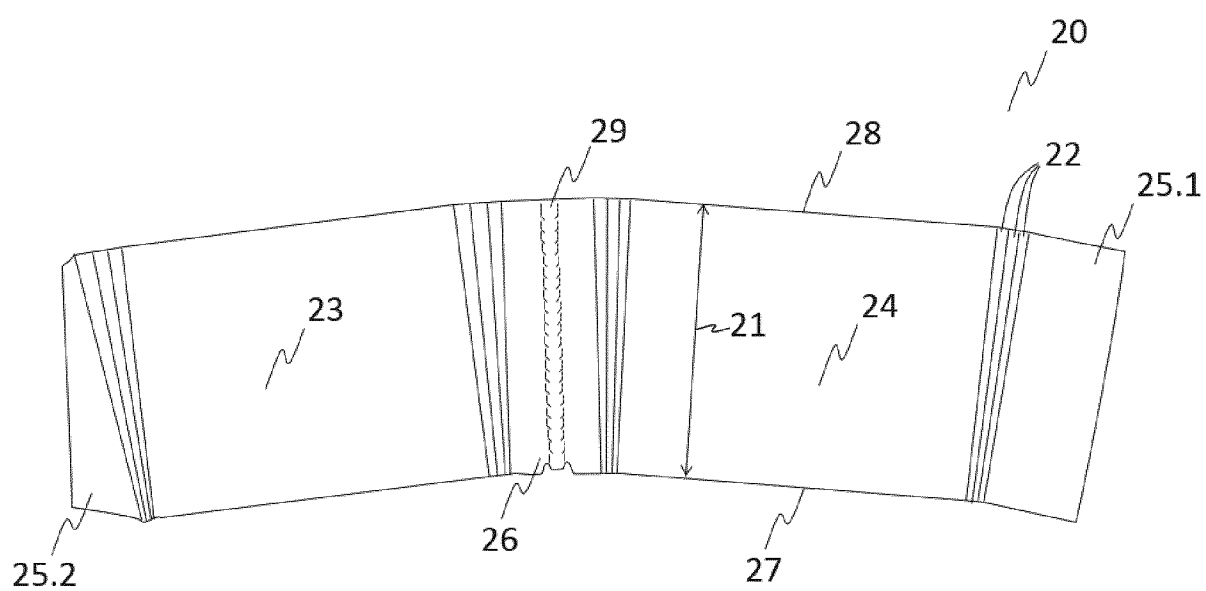


Fig. 2

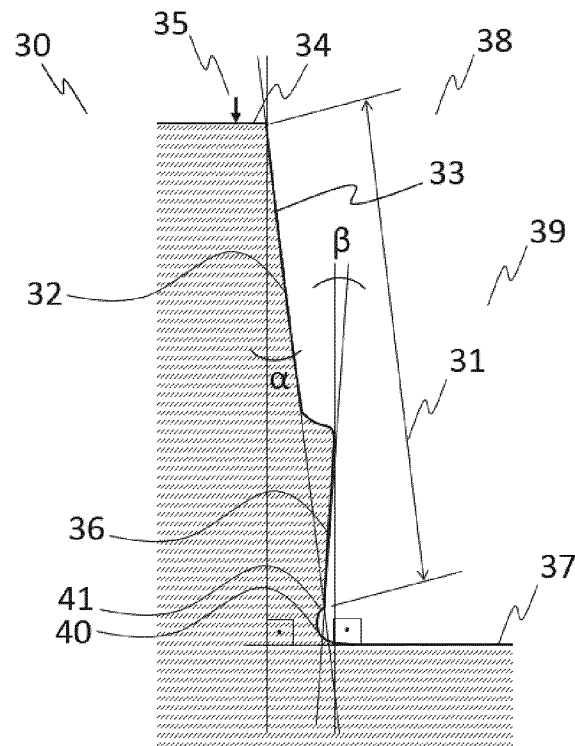


Fig. 3

## INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2017/077425

A. CLASSIFICATION OF SUBJECT MATTER  
 INV. B65D25/36 B65D1/26  
 ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                            | Relevant to claim No. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X         | DE 195 09 100 A1 (WILKE WERNER HEINZ [DE])<br>23 May 1996 (1996-05-23)                                                                                                                                                                                                                        | 1-6,8,9,<br>13,15,16  |
| Y         | column 1, line 4 - line 7; figures 3-6<br>column 1, line 22<br>column 1, line 32 - line 34<br>column 2, line 14 - line 15<br>column 2, line 65 - line 67<br>column 3, line 10 - line 15<br>column 3, line 38 - line 39<br>column 4, line 25 - line 28<br>column 9, line 21 - line 23<br>----- | 7,10-12,<br>14        |
| Y         | DE 20 2007 016006 U1 (OPTIPACK GMBH [DE])<br>30 April 2008 (2008-04-30)<br>paragraph [0035]; figure 1<br>-----<br>-/-                                                                                                                                                                         | 7,10,11               |



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents :

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

20 December 2017

Date of mailing of the international search report

04/01/2018

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Sundell, Olli

## INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2017/077425

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                                                            |                       |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Category*                                            | Citation of document, with indication, where appropriate, of the relevant passages                                         | Relevant to claim No. |
| Y                                                    | DE 75 09 865 U (HILLERS PEFFERMINZ GMBH DR<br>[DE]) 23 October 1975 (1975-10-23)<br>page 1, paragraph 5; figure 1<br>----- | 12,14                 |
| A                                                    | GB 2 333 087 A (SANDHERR PACKUNGEN AG<br>[CH]) 14 July 1999 (1999-07-14)<br>page 12, paragraph 2; figures 6,7<br>-----     | 6                     |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2017/077425

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date    |
|-------------------------------------------|---------------------|----------------------------|------------------------|
| DE 19509100                               | A1                  | 23-05-1996                 | NONE                   |
| DE 202007016006                           | U1                  | 30-04-2008                 | NONE                   |
| DE 7509865                                | U                   | 23-10-1975                 | NONE                   |
| GB 2333087                                | A                   | 14-07-1999                 | AT 243140 T 15-07-2003 |
|                                           |                     | AU 1136897 A               | 17-04-1998             |
|                                           |                     | CH 690431 A5               | 15-09-2000             |
|                                           |                     | DE 19681654 D2             | 09-09-1999             |
|                                           |                     | DE 59610545 D1             | 24-07-2003             |
|                                           |                     | EP 0929455 A1              | 21-07-1999             |
|                                           |                     | GB 2333087 A               | 14-07-1999             |
|                                           |                     | IL 129134 A                | 08-08-2001             |
|                                           |                     | WO 9813270 A1              | 02-04-1998             |