



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.11.2004 Bulletin 2004/47

(51) Int Cl.7: **B65D 5/24**

(21) Application number: **03447108.6**

(22) Date of filing: **13.05.2003**

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

(72) Inventor: **Berthold, Claude**
1200 Brussel (BE)

(74) Representative: **Luys, Marie-José et al**
Gevers & Vander Haeghen,
Holidaystraat 7
1831 Diegem (BE)

(71) Applicant: **Van Genechten Biernans**
2300 Turnhout (BE)

(54) **Refoldable container and blank therefore**

(57) The present invention relates to a refoldable container comprising an open top face (21), a bottom wall (1), and at least one upright side wall (2-5):

- Subsequent side walls (5, 2; 2, 3; 3, 4; 4, 5) are connected by pairs of adjacent first and second gusset panels (6, 6'; 7, 7'; 8, 8'; 9, 9').
- A part of the adjacent first and second gusset panels (6, 6'; 7, 7'; 8, 8'; 9, 9') are partly connected by a pair of adjacent third and fourth gusset panels (16, 16'; 17, 17'; 18, 18'; 19, 19').
- The first (6-9) and second (6'-9') gusset panel, respectively the third (16-19) and fourth (16'-19') gusset panels, are double folded so that the inner faces of the first (6-9) and second (6'-9'), respectively third (16-19) and fourth (16'-19') gusset panels, face each other, and a flap portion (66-69) is formed.
- The flap portion (66-69) comprises a first flap portion (66'-69') comprising the facing first (6-9) and second (6'-9') gusset panels and a second flap portion (66''-69'') comprising the facing third (16-19) and fourth (16'-19') gusset panels.
- The first flap portions (66'-69') are folded so as to lie with an outer face against a facing outer face of an associated side wall (2-5) adjacent the first (6-9) or second (6'-9') gusset panels, the second flap portions (66''-69'') are folded so as to lie with an outer face against an outer face of a subsequent first flap portion (66'-69'),
- At least one of the third (16-19) and fourth (16'-19') gusset panels is connected to a lip (16''-19'') extending from the second flap portion (66''-69'') along a sixth folding line (46-49) between the third (16-19) or fourth (16'-19') gusset panel and the lip, the lip (16''-19'') being positioned between the outer face of a subsequent first flap portion (66'-69') facing a

further side wall (3-5) and the outer face of that further side wall (3-5).

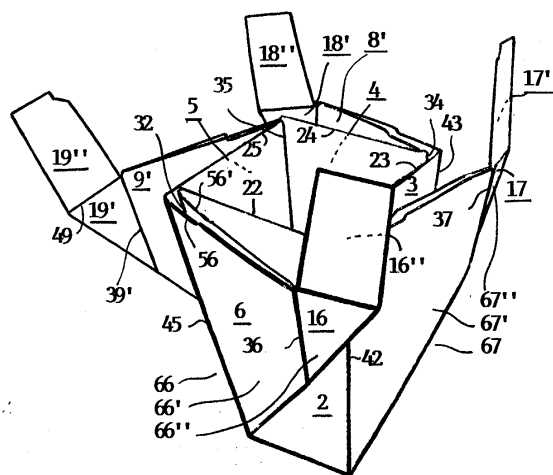


Figure 2

Description

[0001] The present invention relates to a refoldable container and a blank therefore as described in the preamble of the first claim.

[0002] From GB-A-530989, a blank for a receptacle is known which folds easily in a seamless receptacle. The blank comprises a centrally situated rectangular bottom wall, and four side walls connected to the bottom face along bottom fold lines. Adjacent pairs of side walls are interconnected by pairs of adjacent first and second gusset panels, which first and second gusset panels in turn are interconnected partly directly and partly by adjacent third and fourth gusset panels at a position remote from the bottom wall. When folding the blank to the receptacle, the side walls are folded inwardly along the bottom folding lines such that the side walls extend in height direction of the receptacle. Thereby, each time between adjacent side walls, triangular flap portions of double thickness are formed. First flap portions result from the double folding of the first and second gusset panels, second flap portions result from double folding the third and fourth gusset panels, along the folding lines separating the first and second, respectively third and fourth gusset panels. The gusset panels are folded such that the inner faces of the first and second, respectively, third and fourth gusset panels, face each other. The first flap portions are folded so as to lie against an outer face of one of the side walls adjacent the first or second gusset panels. The second flap portions are folded so as to lie against part of an outer face of a subsequent first flap portion, formed from the gusset panels adjacent the side wall against which the first flap portion lies. These second flap portions are attached to these subsequent first flap portions, and to the side wall against which these first flap portions lie, by means of staples.

[0003] The receptacle described in GB-A-530989 has however the disadvantage that it cannot be made in its final form exclusively by folding actions. The flap portions still need to be attached to the side walls by other mechanical connections, e.g. stitches.

[0004] It is the object of the present invention to provide a container and a blank therefore, whereby the container can be erected from the blank by the mere folding of the blank.

[0005] This is achieved with the present invention with the technical features of the characterising part of the first claim.

[0006] In the refoldable container of the present invention, at least one of the third and fourth gusset panels is connected to a lip extending from the second flap portion along a sixth folding line between the third or fourth gusset panel and the lip, the lip being positioned between the outer face of a subsequent first flap portion facing a further side wall and the outer face of that further side wall. The presence of the lips allows to connect subsequent flap portions to each other, and thus to make the container in its final form, exclusively by folding ac-

tions. Indeed, due to the presence of the lip extending from the second flap portion, the second flap portion can be connected to the first flap portion of a subsequent flap portion by folding the lip over the top edge of the first flap portion of the subsequent flap portion along the sixth folding line. In turn, the lip of the second flap portion of the subsequent flap portion can be connected to the further subsequent first flap portion in the same manner. As a result, subsequent flap portions are held together against the associated sides walls of the container, thereby in turn holding together the side walls of the container and thus retaining the form of the container. This is an advantage as compared to the foldable vase known from GB-A-530.989 where the second flap portions still need to be attached to the subsequent first flap portions, and to the side walls against which these subsequent first flap portions lie, by other mechanical means, e.g. staples. Furthermore, the absence of staples in the container of the present invention results in a container which is substantially impermeable for water. This is in contrast to the receptacle known from GB-A-530.989 where the presence of the staples creates a path connecting the space enclosed by the folded blank to the surrounding space through which water can leak in case the receptacle is filled up to the edge with water.

[0007] In a preferred embodiment of the refoldable container of the present invention, a first and second groove is provided in respectively the first and second gusset panel in the vicinity of the top edge of the first and second gusset panel, such that the first and second grooves are aligned to form one continuous groove. The lip of a second flap portion is provided to be received in the groove of the first flap portion of the subsequent flap portion. In case the groove is provided in the top edge of the first flap portion, the lip on the second flap portion can be folded over the groove of the first flap portion of the subsequent flap portion. As a result, the groove in the top edge of the first flap portion is filled up with a thickness of the sheet of the lip. Consequently, the top rim of the container is substantially smooth. This is an advantage from an aesthetical point of view.

[0008] The present invention also relates to a blank for the above-described refoldable container. At least one of the third and fourth gusset panels of the blank for the container of the present invention is connected to a lip extending from the third or fourth gusset panel along a sixth folding line. Further, a first and second groove are provided in respectively the first and second gusset panel in the vicinity of the outer circumferential rim at a position remote from the third folding line separating the first and second gusset panels. The presence of the co-operating lip and groove permits to fold the blank of the present invention into the above-described container exclusively by folding actions.

[0009] The invention and preferred embodiments of the invention are further elucidated in the following figures and description of the figures.

[0010] Figure 1 shows the blank of the container of the invention.

[0011] Figures 2-4 shows intermediate folding steps in the folding of the blank shown in figure 1 into the container of the present invention.

[0012] Figure 5 is a view to the erected container of the present invention.

[0013] The container 100 of the present invention, folded from the blank 10 shown in figure 1, is shown in figure 5. The container 100 comprises an open top face 21, a bottom wall 1 delimited by bottom folding lines 12-15, and upright side walls 2-5 connected to the bottom wall 1 along the corresponding bottom folding lines 12-15. The top edges 22-25 of the side walls 2-5 opposite the bottom folding lines 12-15 delimit the open top face 21 and define a top rim 31 of the container 100. In figure 5, the bottom wall 1 is substantially square-shaped. Alternatively, the bottom wall 1 may also be in the shape of for example a rectangle, triangle, octagon, heptagon, hexagon, pentagon, or may be substantially round.

[0014] As can be seen from figure 5, the top edges 22-25 of the side walls 2-5 extending along the top rim 31 of the container have a larger length than the bottom folding lines 12-15, and the first and second side edges of the side walls 2-5 defined by the first 32-35 and second 42-45 folding lines slant from the top rim 31 towards the bottom wall 1. It is however also possible that the top edges 22-25 of the side walls 2-5 have the same or a smaller length than the bottom folding lines 12-15. Correspondingly, the side walls 2-5 may become wider or narrower towards the top rim 31 of the container 100, or remain straight. In other words, the side walls 2-5 may have a rectangular or square shape, or a trapezoidal shape.

[0015] As can be seen from figure 1 of the blank of the container 100, subsequent pairs of side walls 5, 2; 2, 3; 3, 4; 4, 5 are interconnected by pairs of adjacent first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9'.

[0016] Opposite first and second sides of each side wall 2-5 extend along first 32-35 and second 42-45 folding lines which extend from the bottom wall 1 towards the top rim 31 of the container 100. In figure 5, the first 32-35 and second 42-45 folding lines extend from a corner of the bottom wall 1 towards a corner of the top rim 31. In the blank shown in figure 1 from which the container 100 is made, the first 32-35 and second 42-45 folding lines may also extend from a corner of the bottom wall 1 towards the outer circumferential rim 11.

[0017] As can be seen from figure 1 of the blank, each side wall 2-5 is connected along both of the first 32-35 and second 42-45 folding line to an adjacent gusset panel 6', respectively 7'; 7' respectively 8'; 8' respectively 9'; 9' respectively 6'.

[0018] Adjacent first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9' are at least partly connected to each other along a third folding line 26-29 extending from the bottom wall 1 towards the top rim 31 of the container to

form a flap portion. The length of the third folding line is not critical to the invention and will be adapted by the man skilled in the art to the dimensions of the container. In figure 5 of the container, the third folding line 26-29 extends from a corner of the bottom wall 1 towards the top rim 31, and as can be seen from figure 1 of the blank of the container 100, the third folding line 26-29 extends from a corner of the bottom wall 1 towards a corner of the outer circumferential rim 11. As shown in figure 1, each flap portion comprises a first and a second flap portion. As can also be seen from figure 5, the first 6-9 and second 6'-9' gusset panels are four-edged: a first edge defined by respectively the second 45, 42-44 and first 32-35 folding lines, a second edge defined by the third folding lines 26-29 which is common to adjacent first and second gusset panels, a third edge extending along the outer circumferential rim 11, and a fourth edge defined by respectively the fourth 36-39 and fifth 36'-39' folding lines between adjacent first and third gusset panels 6, 16; 7, 17; 8, 18; 9, 19, respectively second and fourth gusset panels 6', 16'; 7', 17'; 8', 18'; 9', 19' (see below).

[0019] A part of the adjacent first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9' at a position between the third folding line (26-29) and the top rim 31 are interconnected by a pair of adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19'. As a consequence, in the blank shown in figure 1 which the container is made, a part of the adjacent first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9' at a position between the third folding line 26-29 and the outer circumferential rim 11 are interconnected by a pair of adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19'.

[0020] The first 6-9, respectively second 6'-9' gusset panels are connected to the adjacent third 16-19, respectively fourth 16'-19' gusset panel by a fourth 36-39, respectively fifth 36'-39' folding line. The fourth 36-39 and fifth 36'-39' folding lines of adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19' intersect at an intersection point 76-79 on the third folding line 26-29 remote from the bottom wall 1 and extend from the intersection point 76-79 under an acute angle to the top rim 31 of the container. As a consequence, in the blank shown in figure 1 which the container is made, the fourth 36-39 and fifth 36'-39' folding lines of adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19' intersect at an intersection point 76-79 on the third folding line 26-29 remote from the corner of the bottom wall 1 from which the third folding line 26-29 extends and extend from the intersection point 76-79 under an acute angle to the outer circumferential rim 11 of the blank.

[0021] Adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19' lie on opposite sides of an extension 26'-29' of the third folding line 26-29 in the direction of the top rim 31 of the container. As can be seen from figure 1 of the blank of the container, the third 16-19 and fourth 16'-19' gusset panels are three-edged: a first edge being defined by respectively the fourth 36-39 and

fifth 36'-39' folding line, a second edge being defined by the extension 26'-29' of the third folding line 26-29 which is common to adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19', and a third edge extending along the outer circumferential rim 11. In figure 2, the fourth 36-39 and fifth 36'-39' folding lines are perpendicular to the edge extending along the outer circumferential rim 11.

[0022] Subsequent side walls 5, 2; 2, 3; 3, 4; 4, 5 of the container 100 shown in figure 5 are interconnected by flap portions 66-69, formed by double folding the adjacent first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9', respectively the third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19', along the third folding line 26-29, respectively the extension 26'-29' of the third folding line, between them so that the inner faces of adjacent first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9', respectively third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19', face each other, as can be seen from figure 2.

[0023] The flap portions 66-69 are divided in a first flap portion 66'-69' comprising the facing first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9', and a second flap portion 66"-69" comprising the facing third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19'. As can be seen from figure 2, the second flap portions 66"-69" are separated from the first flap portions 66'-69' by a double folding line formed by the facing fourth and fifth folding lines 36, 36'; 37, 37'; 38, 38'; 39, 39'.

[0024] The first flap portions 66'-69' have a first top edge formed by the aligned top edges of the facing first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9'. The second flap portions 66"-69" have a second top edge formed by the aligned top edges of the facing third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19'. From figure 2, it can be seen that the second top edge is inclined downwardly with respect to the first top edge in the direction of the bottom wall 1. The extent to which the second top edge is inclined with respect to the first top edge is such that, when the flap portion 66-69 overlies the associated side walls 2-5, the top edges of the first 66'-69' and second 66"-69" flap portions are at the same height as the top edges 22-25, respectively 23-25, 22, of the associated side walls 2-5, respectively 3-5, 2.

[0025] The first flap portion 66'-69' of the flap portion 66-69 is folded so as to lie against an outer face of one of the side walls 2-5 adjacent the first 6-9 or second 6'-9' gusset panels. In Figure 5, the first flap portion 66'-69' of the flap portion 66-69 lies against an outer face of the side wall 2-5 adjacent the second 6'-9' gusset panel. The second flap portion 66"-69" of the same flap portion 66-69 is folded so as to lie against part of an outer face of a subsequent first flap portion 67'-69', 66', formed from the pairs of gusset panels 7, 7'; 8, 8'; 9, 9'; 6, 6' of which a gusset panels is adjacent the side wall 2-5 over which the first flap portion 66'-69' is positioned. From the above it should be clear that the dimensions and shapes of the different folded parts with respect to each other

are such that the diagonal double fold line of the flap portions 66-69 formed by the third folding line 26-29 and the extension 26'-29' of the third folding line, intersects the second folding line 42-45 of the side wall 2-5 adjacent the gusset panels from which the subsequent flap portion is formed, and the facing fourth and fifth folding lines 36, 36'; 37, 37'; 38, 38'; 39, 39' fall along these second folding lines 42-45.

[0026] At least one of the adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19' is connected to a lip 16"-19" extending from the third or fourth gusset panel along a sixth folding line 46-49, such that the lip 16"-19" extends from the second flap portion 66"-69". In figure 5, the sixth folding line 46-49 extends along the top edge of the fourth gusset panel 16'-19', and the lip 16""-19"" thus extends from the top edge of the second flap portion 66"-69". Alternatively, both the third and fourth gusset panels may be connected to a lip. As a consequence, in the blank shown in figure 1 from which the container is made, the fourth gusset panel 16'-19' is connected to a lip 16"-19" along a sixth folding line 46-49, whereby the sixth folding line 46-49 extends along the outer circumferential rim 11.

[0027] In figure 5, the sixth folding line 46-49 extends along the entire length of the top edge of the fourth gusset panel 16'-19'. Alternatively, the sixth folding line 46-49 may also extend along a part of the length of the top edge of the fourth and/or third gusset panel 16'-19', 16-19.

[0028] The lips 17", 19" attached to the fourth gusset panels 17, 19 of diametrically opposed pairs of gusset panels 7, 7', 17, 17"; 9, 9', 19, 19', are provided with a recessed corner 17"a, 19"a, as can be seen from figure 1 of the blank. The presence of such a recessed corner facilitates the folding of the lip over the top edge/the groove in the top edge of the subsequent first flap portion into the space enclosed between the outer surface of the side walls over which this first flap portion lies and the first flap portion (see below).

[0029] The shape of the lip, or the angle of the sixth folding line with respect to the fourth or fifth folding line, will be adapted such that it fits in the space between the outer face of the first flap portion facing the side wall, the outer face of that side wall and the coincident first and second folding lines.

[0030] In a preferred embodiment of the container shown in figure 5, a first 56-59 and second 56'-59' groove is provided in respectively the first 6-9 and second 6'-9' gusset panels in the vicinity of the outer circumferential rim 11, as can best be seen from figure 1 of the blank. The first 56-59 and second 56'-59' grooves are aligned in the flap portions 66-69, thereby forming one continuous groove in the top edge of the first flap portion 66'-69'. The lip 16"-19", extending from the second flap portion 66"-69" is provided to cooperate with the groove in the first flap portion 67'-69', 66' of the subsequent flap portion 67-69, 66.

[0031] The dimensions and shapes of the different

folded parts of the container with respect to each other are such that, the lip 16"-19", extending from the top edge of the second flap portion 66"-69" can cooperate with the groove in the first flap portion 67'-69', 66' of the subsequent flap portion 67-69, 66. As can be seen from figure 1 of the blank, the first 56-59 and second 56'-59' grooves are provided in respectively the first 6-9 and second 6'-9' gusset panels at a position in the outer circumferential rim 11 adjacent the second 45, 42-44, respectively first 32-35 folding lines separating the first 6-9, respectively second 6'-9' gusset panels from the adjacent side walls 5, 2-4. As a result in the container 100 shown in figure 5 made from the blank shown in figure 1, the continuous groove in the top edge of the first flap portion 66'-69' is at a position adjacent a corner of the top rim 31. Alternatively, the first 56-59 and second 56'-59' grooves may be positioned in respectively the first 6-9 and second 6'-9' gusset panels at a position in the outer circumferential rim 11 remote from the second 45, 42-44, respectively first 32-35 folding lines in the direction of the third folding line 26-29 separating the first 6-9 and second 6'-9' gusset panels. In the latter case, the groove in the first flap portion 66'-69' of the container made from the blank would be at a position remote from a corner of the top rim 31.

[0032] As can be seen from figures 2-4, the second flap portion 66"-69" is attached to this first flap portion 67'-69', 66' of this subsequent flap portion 67-69, 66, by folding downwardly the lips 16"-19" extending from the second flap portions 66"-69" in the direction of the bottom wall 1 along the sixth folding lines 46-49, over the grooves in the top edge of the first flap portions 67'-69', 66' of the subsequent flap portions 67-69, 66. Hereby, the lips 16"-19" extend downwardly in the direction of the bottom wall 1 in the space enclosed between the outer surface of the side walls 3-5, 2 against which the first flap portions 67'-69', 66' lie and the first flap portions 67'-69', 66'. As a result, the top edge of the first flap portion 66'-69' at the position of the groove is at the same height as the top edge 22-25 of the associated side wall 2-5. Consequently, the container 100 has a smooth top rim 31, which is an advantage from an aesthetical point of view.

[0033] In figure 5, the height of the first 66'-69' and second 66"-69" flap portions is substantially equal to the height of the associated side wall 2-5; respectively 3-5, 2. Alternatively, the height of the first 66'-69' and second 66"-69" flap portions may also be smaller or larger than the height of the associated side wall 2-5; respectively 3-5, 2

[0034] The second flap portion 66'-69" may extend over only a part of, as shown in figure 5, or alternatively, over the entire width of the associated side wall 3-5, 2 at a certain height of the side wall. In figure 5, where the height of the first 66'-69' and second 66"-69" flap portions is substantially equal to the height of the associated side wall 2-5; respectively 3-5, 2, it follows that the top edge of the second flap portion 66"-69" extends

along a part of the top edge 23-25, 22 of the associated side wall 3-5, 2. Alternatively, the top edge of the second flap portion 66"-69" may also extend along the entire length of the top edge 23-25, 22 of the associated side wall 3-5, 2.

[0035] From the above it follows that in the container shown in figure 5, each time at the position of the top rim 31 of the container where the top edge of second flap portions 66"-69" extends along the top edge of the associated side walls 3-5, 2, the top rim 31 is made up of five thicknesses of sheets. Over the remaining lengths of the top rim of the container, the top rim is made up of only three thicknesses of sheets. This increase of thickness at the top rim 31 of the container renders the container relatively stiff around its opening and resistant to shearing.

[0036] The container 100 shown in figure 5 can be formed by folding the blank 10 shown in figure 1, as shown in figures 2-4. The side walls 2-5 are folded along the bottom folding lines 12-15 with respect to the bottom wall 1 such that the side walls 2-5 extend upwardly from the bottom folding lines 12-15. This brings the first folding line 32-35 of the side wall 2, 3, 4, 5 together with the subsequent second folding line 45, 42, 43, 44 of the subsequent side wall 5, 2, 3, 4. Simultaneously, adjacent first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9', together with the adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19', are folded along the third folding line 26-29 and the extension 26'-29' of the third folding line between them so that the inner faces of adjacent first and second 6, 6'; 7, 7'; 8, 8'; 9, 9' and the inner face of adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19', face each other to form a flap portion 66-69. As a result, the fourth 36-39 and fifth 36'-39' folding lines separating adjacent first and third 6, 16; 7, 17; 8, 18; 9, 19, respectively second and fourth gusset panels 6, 16; 7, 17; 8, 18; 9, 19, also face each other. These flap portions 66-69, shown in figure 2, are then pivoted in the same sense about the adjacent first folding lines 32-35 of the side walls 2-5. As a result, the first flap portions 66'-69', comprising the facing pairs of adjacent first and second gusset panels 6, 6'; 7, 7'; 8, 8'; 9, 9' come to lie against the side walls 2-5, whereby the outer surface of the second gusset panels 6'-9' lies against the outer surface of the side wall 2-5. The diagonal double fold line of the flap portions 66-69 formed by the third folding line 26-29 and the extension 26'-29' of the third folding line, thereby intersects the second folding line 42-45 of the side wall 2-5 opposite the first folding line 32-35, and the facing fourth and fifth folding lines 36, 36'; 37, 37'; 38, 38'; 39, 39' fall along these second folding lines 42-45. Subsequently, the second flap portions 66"-69" comprising the facing pairs of adjacent third and fourth gusset panels 16, 16'; 17, 17'; 18, 18'; 19, 19' are folded, along the facing fourth and fifth folding lines 36, 36'; 37, 37'; 38, 38'; 39, 39', around these second folding lines 42-45. As a result, these second flap portions 66"-69" come to lie against the first flap

portions 67'-69', 66' of the subsequent flap portions 67-69, 66. Subsequently, the lips 16"-19", extending from the top edge of the second flap portions 66"-69", are folded downwardly in the direction of the bottom wall 1 along the sixth folding lines 46-49 over the grooves in the top edge of the first flap portions 67'-69', 66'. Hereby, the lips 16"-19" extend downwardly in the direction of the bottom wall 1 in the space enclosed between the outer surface of the side walls 3-5, 2 over which the first flap portions 67'-69', 66' lie and the first flap portions 67'-69', 66', and the inner surface of the lip 16"-19" faces the outer surface of the side wall 3-5, 2. In this way, the different flap portions 66-69 are connected to each other and are thus held together against the associated side walls 2-5, thereby in turn holding together the enclosed side walls 2-5. The order in which subsequent flap portions are attached to each other can be varied. One possible way of folding is as shown in figures 2-4. It is however preferred that one of the second flap portions comprising a lip with a recessed corner, is the last second flap portion to be folded over the groove in the top edge of the subsequent first flap portion into the space enclosed between the outer surface of the side walls over which this first flap portion lies and the first flap portion.

[0037] The container is seamless since it is made by the mere folding a blank. Consequently, the contents of the container within the space enclosed by the blank cannot escape, except at the open top face of the container. In case the container is used for the purpose for containing water, the blank can be made from a water-impermeable material. The blank can be provided, at least at the side of the blank which is destined to form the interior of the container, with a hydrophobic layer. Such a hydrophobic layer can for instance comprise a coating of polyethylene. Any other suitable water-impermeable material can however also be used such as for example plastic foil having sufficient rigidity, coated cardboard, coated paper.

[0038] The blank 10 shown in figure 1, from which the above-described container 100 is formed, comprises an outer circumferential rim 11 which is substantially square shaped. The outer circumferential rim 11 encloses a substantially square shaped bottom wall 1 situated substantially in the centre of the outer circumferential rim 11. The bottom wall 1 is delimited by bottom folding lines 12-15. The blank 10 may however have also any other suitable shape and may for instance be in the shape of a rectangle, hexagon, triangle, or pentagon. The bottom wall 1 may also be in the shape of for example a rectangle, triangle, hexagon, pentagon,

[0039] The blank 10 comprises four side walls 2-5 which are connected to the bottom wall 1 along the respective bottom folding lines 12-15. The top edges 22-25 of the side walls 2-5 opposite to the bottom folding lines 12-15 are parallel thereto and extend along the outer circumferential rim 11 of the blank 10. In figure 1, the top edges 22-25 of the side walls 2-5 extending along the outer circumference 31 of the blank have a larger

length than the bottom folding lines 12-15, and the first and second side edges of the side walls 2-5 defined by the first 32-35 and second 42-45 folding lines slant from the broad end towards the smaller end. It is however also possible that the top edges 22-25 of the side walls 2-5 have the same or a smaller length than the bottom folding lines 12-15.

[0040] All other features of the blank are already described above in the paragraphs relating to the container.

Claims

1. A refoldable container made from a blank, the container comprising

- an open top face (21), a bottom wall (1) and at least one upright side wall (2-5); the bottom wall being connected to the at least one upright side wall (2-5) along corresponding bottom folding lines (12-15);
- the at least one side wall (2-5) comprising at a position opposite the bottom folding line (12-15) a top edge (22-25) delimiting the open top face (21) and defining a top rim (31) of the container (100); subsequent side walls (5, 2; 2, 3; 3, 4; 4, 5) being connected by pairs of adjacent first and second gusset panels (6, 6'; 7, 7'; 8, 8'; 9, 9');
- opposite first and second sides of each side wall (2-5) extending along first (32-35) and second (42-45) folding lines which extend from the bottom wall (1) towards the top rim (31) of the container (100);
- adjacent first and second gusset panels (6, 6'; 7, 7'; 8, 8'; 9, 9') being connected to each other, the connection extending partly along a third folding line (26-29) which extends from the bottom wall (1) towards the top rim (31) and partly, at a position between the third folding line (26-29) and the top rim (31), along a pair of adjacent third and fourth gusset panels (16, 16'; 17, 17'; 18, 18'; 19, 19'), the third (16-19) and fourth (16'-19') gusset panels lying on opposite sides of an extension (26'-29') of the third folding line (26-29),
- the first (6-9) respectively second (6'-9') gusset panel, being connected to the third (16-19) respectively fourth (16'-19') gusset panel, by a fourth (36-39) respectively fifth (36'-39') folding line, the fourth (36-39) and fifth (36'-39') folding line intersecting at an intersection point (76-79) on the third folding line (26-29) remote from the bottom wall (1)
- the first (6-9) and second (6'-9') respectively third (16-19) and fourth (16'-19') gusset panels, being double folded along the third (26-29) re-

- spectively the extension (26'-29') of the third folding line, in such a way that inner faces of the first (6'-9') and second (6'-9') respectively third (16'-19') and fourth (16'-19') gusset panels, face each other and a flap portion (66'-69') is formed, the flap portion comprising a first flap portion (66'-69') comprising the facing first (6'-9') and second (6'-9') gusset panels and a second flap portion (66'-69') comprising the facing third (16'-19') and fourth (16'-19') gusset panels,
- the first flap portions (66'-69') being folded along the first (32-35) and second (42-45) folding line of subsequent side walls (5, 2; 2, 3; 3, 4; 4, 5) so as to lie with an outer face against a facing outer face of an associated side wall (2-5) adjacent the first (6'-9') or second (6'-9') gusset panels, the second flap portions (66'-69') being folded along the fourth (36-39) and fifth (36'-39') folding line so as to lie with an outer face against an outer face of a subsequent first flap portion (66'-69'),

characterized in that

at least one of the third (16-19) and fourth (16'-19') gusset panels is connected to a lip (16"-19") extending from the second flap portion (66"-69") along a sixth folding line (46-49) between the third (16-19) or fourth (16'-19') gusset panel and the lip, the lip (16"-19") being positioned between the outer face of the subsequent first flap portion (66'-69') facing the further side wall (3-5, 2) and the outer face of that further side wall.

2. The container according to claim 1, **characterized in that** the first (6-9) and second (6'-9') gusset panels comprise a top edge, **in that** at a position in the vicinity of the top edge of the first (6-9) and second (6'-9') gusset panel respectively a first (56-59) and second (56'-59') groove is provided, the first (56-59) and second (56'-59') grooves being aligned so as to form one continuous groove, and **in that** the lip (16"-19") of the second flap portion (66"-69") is provided to cooperate with the groove of the subsequent flap portion (67-69, 66).

3. The container according to claim 1 or 2, **characterized in that** the third (16-19) and fourth (16'-19') gusset panels comprise a top edge, **in that** the second flap portion (66"-69") comprises a top edge formed by the aligned top edges of the facing third (16-19) and fourth (16'-19') gusset panels, **in that** the sixth folding line (46-49) extends along the top edge of the third (16-19) or fourth (16'-19') gusset panel such that the lip (16"-19") extends from the top edge of the second flap portion (66"-69").

4. The container according to any one of claims 2-3, **characterized in that** the first flap portion (66'-69')

comprises a top edge formed by the aligned top edges of the facing first (6-9) and second (6'-9') gusset panels, **in that** the top edge of the first (66'-69') flap portion is aligned with the top edge of the associated side wall (2-5; 3-5, 2).

5. The container according to claim 4, **characterized in that** the top edge of the second flap portion (66"-69") extends along at least part of the top edge (23-25, 22) of a subsequent first flap portion (67'-69', 66') and the further side wall (3-5, 2).

6. The container according to any one of claims 1-5, **characterized in that** each of the bottom wall (1) and top rim (31) comprise a plurality of corners, the first (32-35) and second (42-45) folding lines extending from a corner of the bottom wall (1) towards a corresponding corner of the top rim (31), the third folding lines (26-29) extending from a corner of the bottom wall (1) towards the top rim (31).

7. The container according to any one of claims 1-6, **characterized in that** the bottom wall (1) has the shape of a polygone, preferably rectangular, square-shaped, octagonal, heptagonal, hexagonal, pentagonal or triangular, or is substantially round or oval.

8. The container according to any one of claims 1-7, **characterized in that** the top edge (22-25) of each side wall (2-5) has a length which is equal to, smaller than or larger than the length of the corresponding bottom folding line (12-25).

10. The container according to any one of claims 1-9, **characterized in that** the container is made of a water-impermeable material, preferably a coated cardboard, coated paper, or a plastic material.

11. A blank (10) for an erectable/foldable container, the blank (10) comprising an outer circumferential rim (11), the outer circumferential rim (11) comprising:

- a bottom wall (1) situated substantially in the centre of the blank (10) and at least one side wall (2-5); the bottom wall (1) being connected to the at least one side wall (2-5) along corresponding bottom folding line (12, 13, 14, 15),
- the at least one side wall (2-5) comprising at a position opposite the bottom folding line (12-15) a top edge (22-25) extending along the outer circumferential rim (11), subsequent side walls (2, 3; 3, 4; 4, 5; 5, 2) being connected by pairs of adjacent first and second gusset panels (6, 6'; 7, 7'; 8, 8'; 9, 9'),
- opposite first and second sides of each side wall (2-5) extending along first (32-35) and sec-

ond (42-45) folding lines which extend from the bottom wall (1) towards the outer circumferential rim (11),

- adjacent first and second gusset panels (6, 6'; 7, 7'; 8, 8'; 9, 9') being connected to each other, the connection extending partly along a third folding line (26-29) which extends from the bottom wall (1) towards the outer circumferential rim (11) and partly, at a position between the third folding line (26-29) and the outer circumferential rim (11), along a pair of adjacent third and fourth gusset panels (16, 16'; 17, 17'; 18, 18'; 19, 19'), the third (16-19) and fourth (16'-19') gusset panels lying on opposite sides of an extension (26'-29') of the third folding line (26-29),
- the first (6-9), respectively second (6'-9') gusset panels being connected to the third (16-19), respectively fourth (16'-19') gusset panels by a fourth (36-39), respectively fifth (36'-39') folding line, the fourth (36-39) and fifth (36'-39') folding line intersecting at an intersection point (76-79) on the third folding line (26-29) remote from the bottom wall (1),

characterized in that,

- at least one of the third (16-19) and fourth (16'-19') gusset panels is connected to a lip (16"-19") extending from the third (16-19) or fourth (16'-19') gusset panel along a sixth folding line (46-49) between the third (16-19) or fourth (16'-19') gusset panel and the lip (16"-19"),
- **in that** the first (6-9) and second (6'-9') gusset panels comprise a top edge, and **in that** at a position in the vicinity of the top edge of the first (6-9) and second (6'-9') gusset panel respectively a first (56-59) and second (56'-59') groove is provided.

12. The blank according to claim 11, **characterized in that** the sixth folding line (46-49) extends along the top edge of the third (16-19) and fourth (16'-19') gusset panels such that the lip (16"-19") extends from the top edge of the third (16-19) or fourth (16'-19') gusset panel.

13. The blank according to claim 11 or 12, **characterized in that** each of the bottom wall (1) and the outer circumferential rim (11) comprise corners, the first (32-35) and second (42-45) folding lines extending from a corner of the bottom wall (1) towards the outer circumferential rim (11) of the container (100), the third folding lines (26-29) extending from a corner of the bottom wall (1) towards a corresponding corner of the outer circumferential rim (11) of the container (100).

14. The blank according to any one of claims 11-13 **characterized in that** the top edge (22-25) of each side wall (2-5) has a length which is equal to, smaller than or larger length than the length of the corresponding bottom folding line (12-15).

15. The blank according to any one of claims 11-14, **characterized in that** the bottom wall (1) has the shape of a polygone, preferably rectangular, square-shaped, octagonal, heptagonal, hexagonal, pentagonal or triangular, or is substantially round or oval.

16. The blank according to any one of claims 11-15, **characterized in that** the blank is made out of a water-impermeable material.

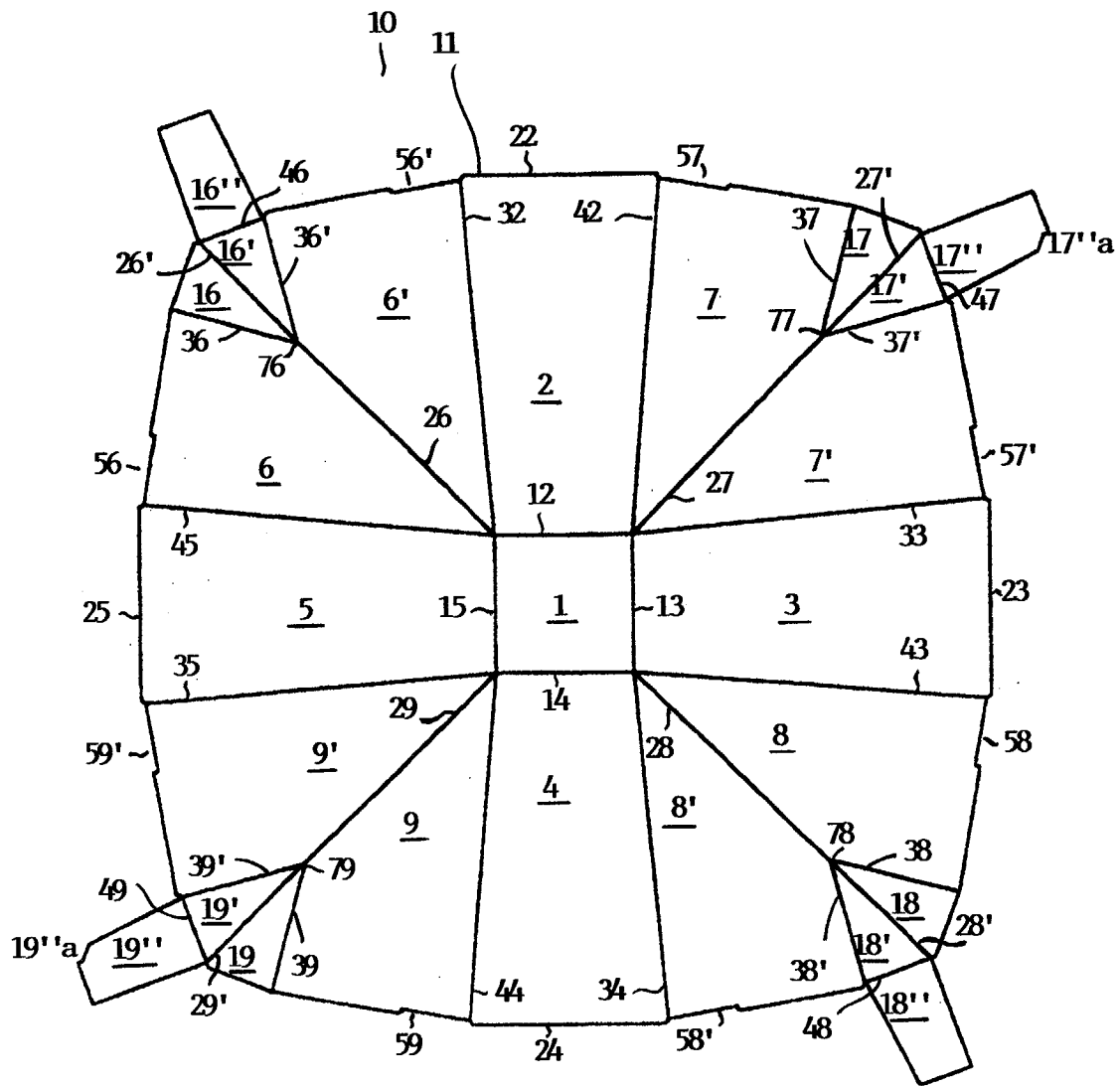


Figure 1

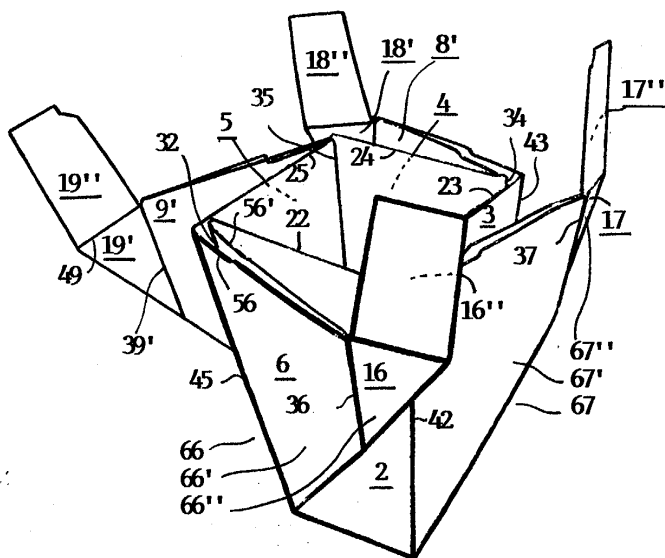


Figure 2

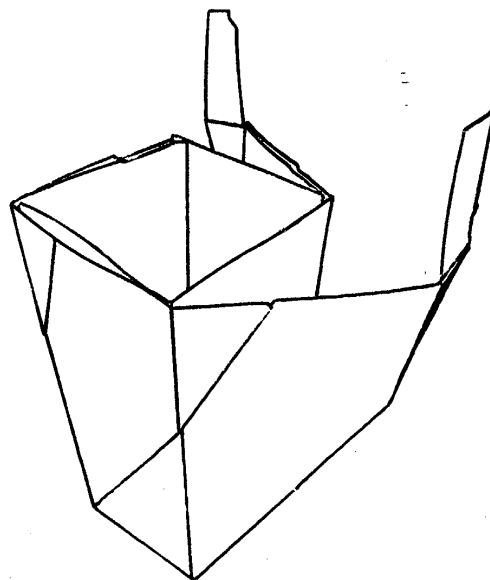


Figure 3

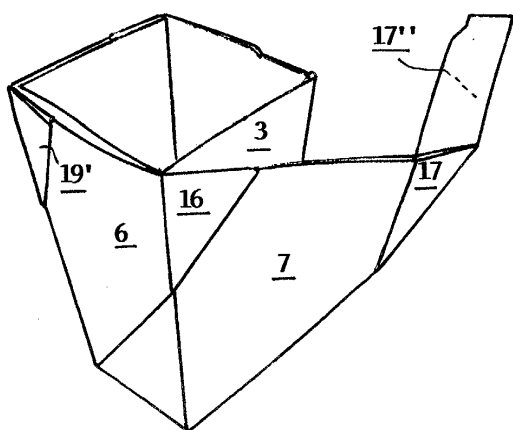


Figure 4

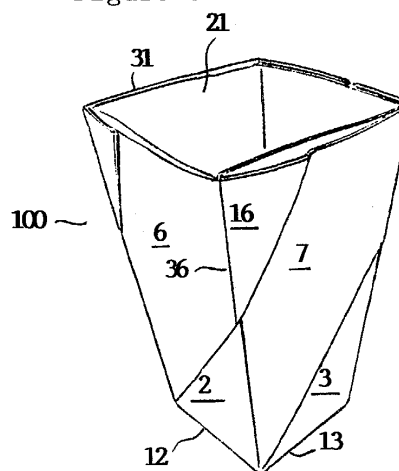


Figure 5



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 44 7108

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.7)
D,A	GB 530 989 A (JOHN RALPH SIMMONS;MEDWAY PAPER SACKS LTD) 27 December 1940 (1940-12-27) * figures 1-8 *	1,11	B65D5/24
A	US 2 630 263 A (RINGLE WILLIAM A) 3 March 1953 (1953-03-03) * figures 12,13 *	1,11	
A	US 1 046 945 A (F. W. BAUER, P. KNUPPEN) 10 December 1912 (1912-12-10) * figure 6 *	1,11	
A	US 1 369 634 A (JACK DON) 22 February 1921 (1921-02-22) * figure 3 *	1,11	
A	US 3 289 914 A (FERDINAND LANGE-WIEHE) 6 December 1966 (1966-12-06) * figures 16-18 *	1,11	
A	US 3 054 550 A (COMSTOCK ALFRED E) 18 September 1962 (1962-09-18) * figures 11-15 *	1,11	TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 7 November 2003	Examiner Schultz, O
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 44 7108

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-11-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 530989	A	27-12-1940	NONE	
US 2630263	A	03-03-1953	NONE	
US 1046945	A		NONE	
US 1369634	A	22-02-1921	NONE	
US 3289914	A	06-12-1966	NONE	
US 3054550	A	18-09-1962	NONE	