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

(11) EP 1 790 573 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.05.2007 Bulletin 2007/22

(51) Int Cl.:
B65D 5/355 *(2006.01)* ***B65D 1/02*** *(2006.01)*

(21) Application number: **06425802.3**

(22) Date of filing: **24.11.2006**

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

(30) Priority: **25.11.2005 IT SA20050020**

(71) Applicant: **Ragno, Livio**
84020 Colliano (SA) (IT)

(72) Inventor: **Ragno, Livio**
84020 Colliano (SA) (IT)

(54) Container with variable volume

(57) Variable volume container which can be reduced by pre-set folding lines allowing the suitable function guaranteeing that freshness is preserved and the space which it occupies is reduced.

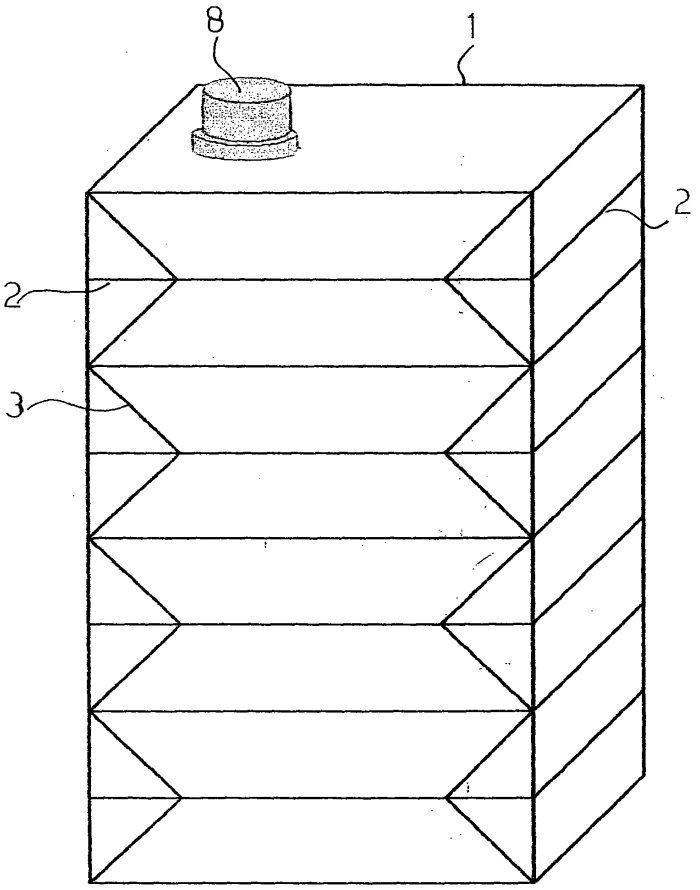


FIG. 5

EP 1 790 573 A1

Description

Technical field

[0001] This invention regards the field of paper and cardboard containers meant for better preserving and keeping inside them, after their opening, the freshness and organolpetical characteristics of their content, by the progreessive elimination of the air inside them, a function deriving from a suitable pressure on the remaining empty part of the container itself provided with folding lines.

State of the technique

[0002] Presently the containers of the so many different drinks or foods existing today on the market, do not offer the possibility of reducing their capability according to the remaining content during the consumption of the content itself, all containers, even if they are manufactured in so many shapes, have in common the characteristic of their invariable volume. On their opening and the initial emptying of part of their content, air penetrates into them, replacing the consumed product, and that causes, in the remaining content, the consequent loss of freshness and of its organoleptical characteristics; that is caused by a deterioration process provoked by many factors, one of the most important ones among them, is the product oxidation caused by the oxygen present in the ever increasing portion of air which from time to time replaces the liquid taken out from the container, until the complete emptying of the container.

Aims and advantages of the invention

[0003] This invention represents the right solution to the problems caused by the above-said negative characteristic of the containers produced up to now.

[0004] The aim of this invention is that of suggesting the use of a container fit for containing any kind of eatable liquids and fluids (milk, wine, mineral water, non alcoholic drinks, fruit juices and any kinds of drinks sold on the market) and liquids of a non eatable kind, for which the progressive reduction of the space, even the total space occupied, is necessary or useful, and that being possible by the elimination of the oxygen portion which is present in any container manufactured according to the foregoing technique, thanks to its folding lines provided on the container.

[0005] Another aim of this invention is that of making it easier for the consumer, to catch the container, thanks to its folding lines which are ergonomic elements fostering its handling.

[0006] Another aim of this invention, conforming with the foregoing aims, is that of obtaining a container which after the total emtying of its content (which can also be a powder content) and the consequent reduction of the original volume of the returnable empty, causes undoubtful advantages also for the disposal of urban solid waste.

[0007] Illustration of the Drawings and the operation procedure for the invention realization The aims and advantages can be better understood referring to the detailed description and the enclosed illustrative and limiting drawings in which:

Fig. 1 shows the container in a first preferred shape, from its front view with its wide bellows.
Fig.2 shows the container from its front view with its partially closed bellows.
Fig.3 shows the container from a front view with its quite fully closed bellows.
Fig.4 shows the container from its front view with its fully closed bellows, after the complete emptying of the content.
Fig.5 shows the container from its three dimensional view when it is full and its bellows is wide.
Fig.6 shows a plant view of the container with its folding lines traced (creasings).
Fig.7 shows another preferred shape of the container, from its three-dimensional view, when it is full and its bellows is not pressed.
Fig.8 shows a plant view of the container with the folding lines traced.

[0008] With reference to the drawings in a first preferred shape the polyhedric container (1) is provided with folding lines or creasings, arranged either horizontally (2) or at an angle (3) according to its longitudinal dimension, so that if they are pressed or squashed, they cause the gradual reduction of the container height, like a bellows, and its volume chages according to the remaining amount of liquid which it contains.

[0009] In another preferred shape the parallelepiped container (4) is provided on two opposite sides, by a vertical folding line (5) which on its two ends meets a perimetre horizontal folding line (6) and two folding lines arranged at an angle (7), in order to cause the gradual reduction of the container width like a bellows, so that the volume changes according to the remaining amount of liquid which it contains.

[0010] The container can be also produced in other shapes, like the cubic, the cylinder, the conic, the polyhedric with a triangular basis, the pentagonal, exagonal, octagonal and/or any other possible shape, in order that the arrangement of the folding lines can be pre-set with any angle fit for causing the volumetric reduction of the container.

[0011] The container can also be produced with many different materials: cardboard, composite tetra-pac cardboard, aluminium cardboard, plastic.

[0012] Once the closing device of the container is opened, and it can be a screw plug (8) and once the liquid which it contains is partly used, the volume of the container can be reduced by a mere hand pressing, so eliminating the air volume occupied before by the used liquid, and once it is closed again, it guarantees that the volume modification is kept constant. The constancy of volume

modification allows to determine, even if merely on sight or by a graded scaled printed on the container, the amount of the remaining product inside the container itself. Once the container is emptied and its volume is reduced by the squashing on the folding lines, even if it is not provided with a closing device, volume reduction keeps being constant and that is an advantage for its disposal as a waste material.

[0013] As above-said and explained, the advantages of this invention result to be many and different, according to the typology of content, when it contains wine, an acetification process often occurs in the common containers having a fixed volume, this process is physically impossible with the container subject of this invention, because it results to be always full, regardless of the remaining portion of wine present in the container itself.

[0014] In case the liquid containted consists of sparkling drinks, the known process of leaking and the consequent taste deterioration of the content leaking in the empty space within the container, is avoided. This leaking effect is acoustically perceptible because on opening the container the classical whistling of the air under pressure instantaneously coming from the container, can be heard. This invention can be easily realized and mass-produced, since it can be industrially manufactured, thanks to rotative or paper machines, directly carrying out on the raw matter, the creasing and dinking of the prepared folding lines which determine the bellows function and effect of the present invention; moreover it does not need any additions or increases in the raw matter compared with the common containers presently sold on the market.

[0015] The variable volume container of this invention, regardless of its shape, has got on its top a hermetic closing device, the underyling part of it, that is the body, wholly or partially, shows many folding rectilinear, horizontal, vertical or oblique lines which allow a pre-set deformation reduction of each element of the container body, by the pressure of the elements which determine its bellows function.

Claims

1. Container provided with folding lines and creasings which are arranged either horizontally (2) or at an angle (3) along its longitudinal dimension, in order that if they are pressed or squashed, they cause the gradual reduction of the container height, like a bellows, so that its volume is varied according to the remaining amount of liquid which it contains.

2. Parallelepiped container provided on two opposite sides of a vertical folding line (3) which meets, on its two ends, a perimetre horizontal folding line (4) and two folding lines arranged at an angle (5), in order that if they are pressed or squashed, they cause the gradual reduction of the container width, like a bellows, so that its volume is varied according to the remaining amount of liquid which it contains.

3. Container as referred to by claims 1), and 2), the characteristic of which is that of having a closing device which, once it is opened and the liquid it contains is partially consumed, its volume can be reduced by a mere hand pressing, so eliminating the air volume occupied before by the used liquid, and once it is closed again it guarantees that the modified volume remains the same.

4. Container as referred to by claims 1), 2), and 3), the characteristic of which is that its changed volume keeps being the same, and therefore the amount of the product remained within the container itself can be determined.

5. Container as referred to by the foregoing claims, the characteristic of which is that when it is emptied of its content and its volume is reduced as an effect of the squashing of its folding lines, even if it is not provided with a closing device, the reduction of its volume is kept constant and therefore its disposal is facilitated.

6. Container as referred to by the foregoing claims, the characteristic of which is that it can be produced in a cubic, or a cylindric, conic, polyhedric with a triangular basis, pentagonal, exagonal, octagonal and/or in any other compatible shape, so that the arrangement of the folding lines can be pre-set with any angle fit for causing the volumetric reduction of it.

7. Container as referred to the by the foregoing claims, the characteristic of which is that it can be produced with many different materials: cardboard, composite tetra-pac cardboard, aluminium-cardboard, plastic.

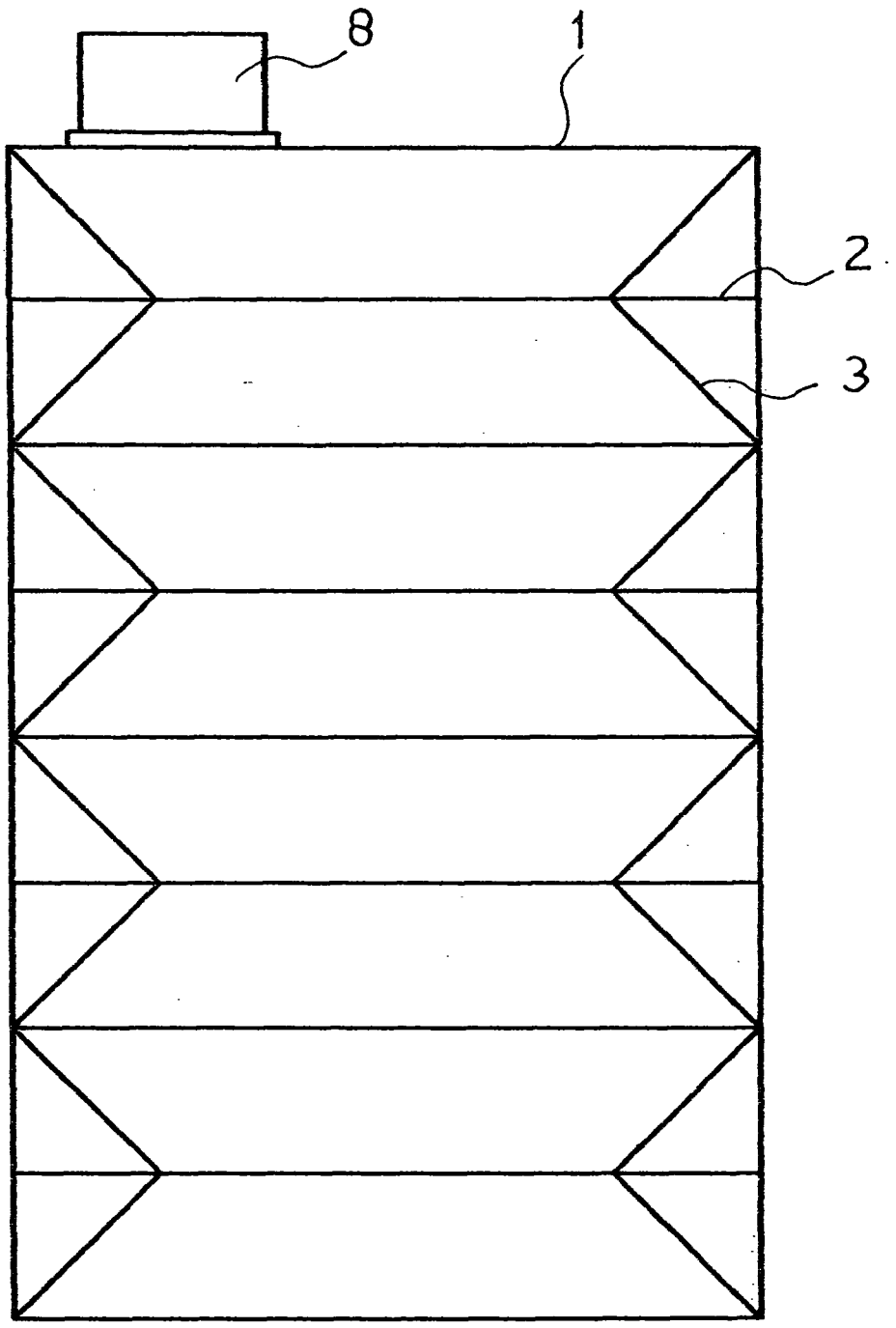


FIG.1

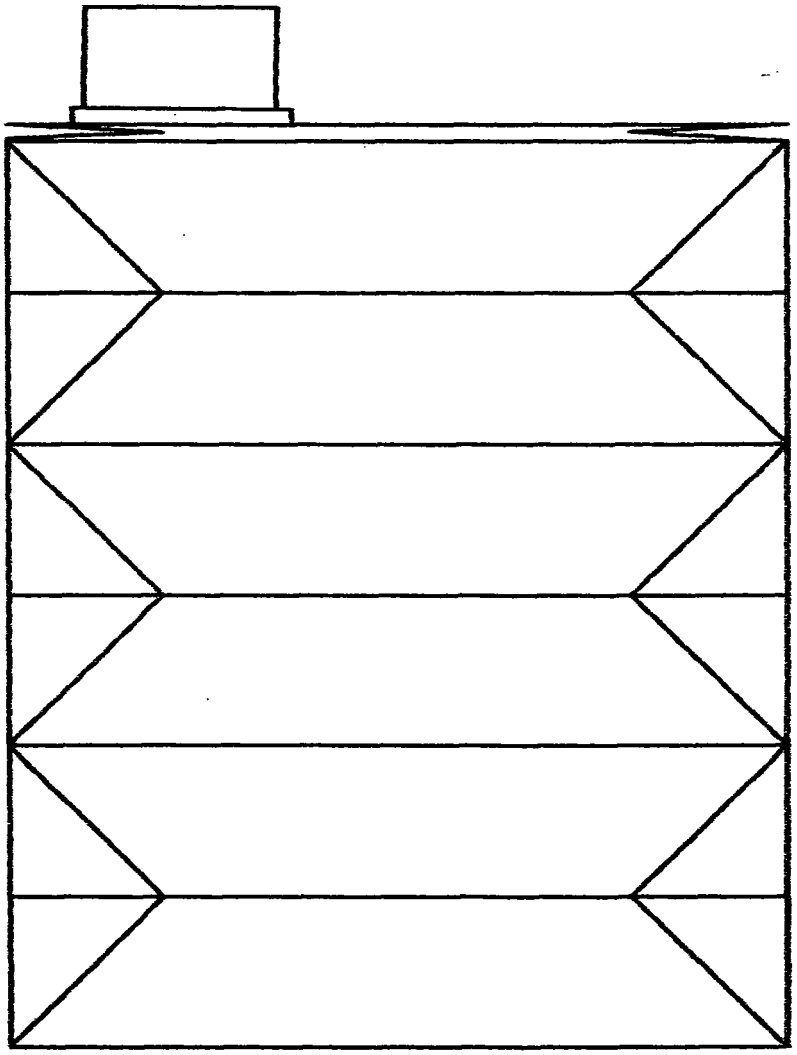


FIG.2

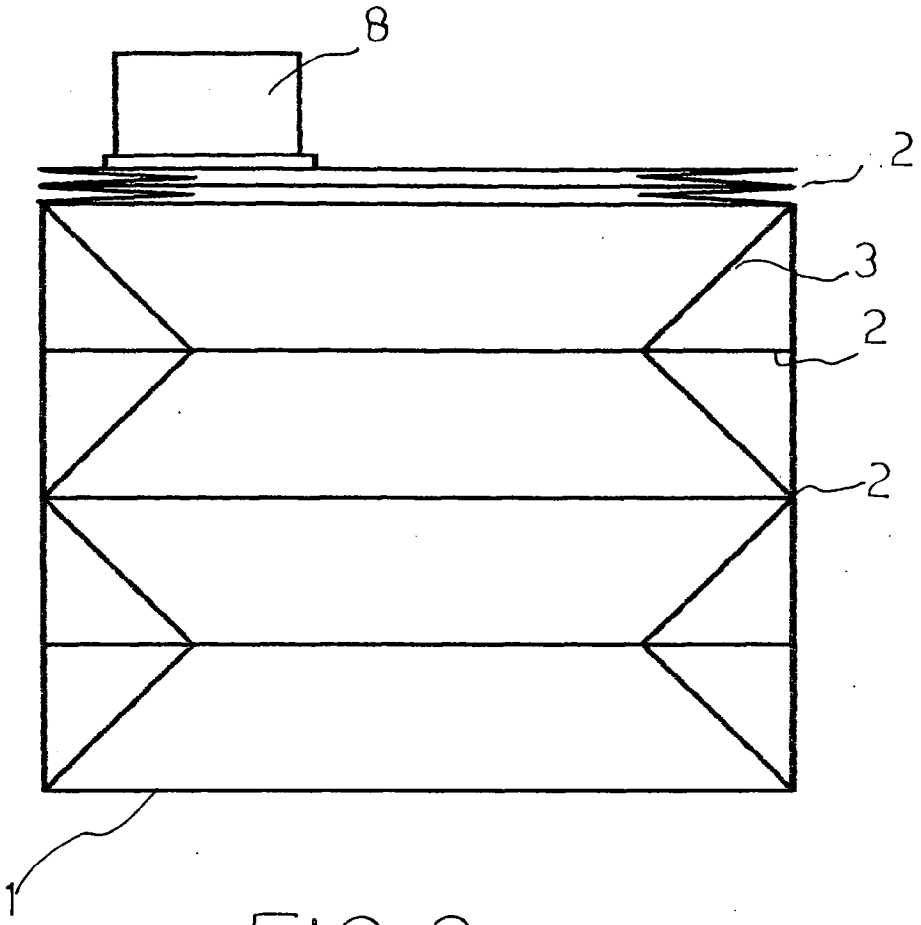


FIG.3

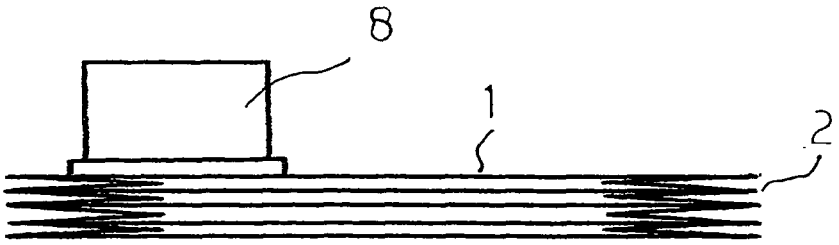


FIG.4

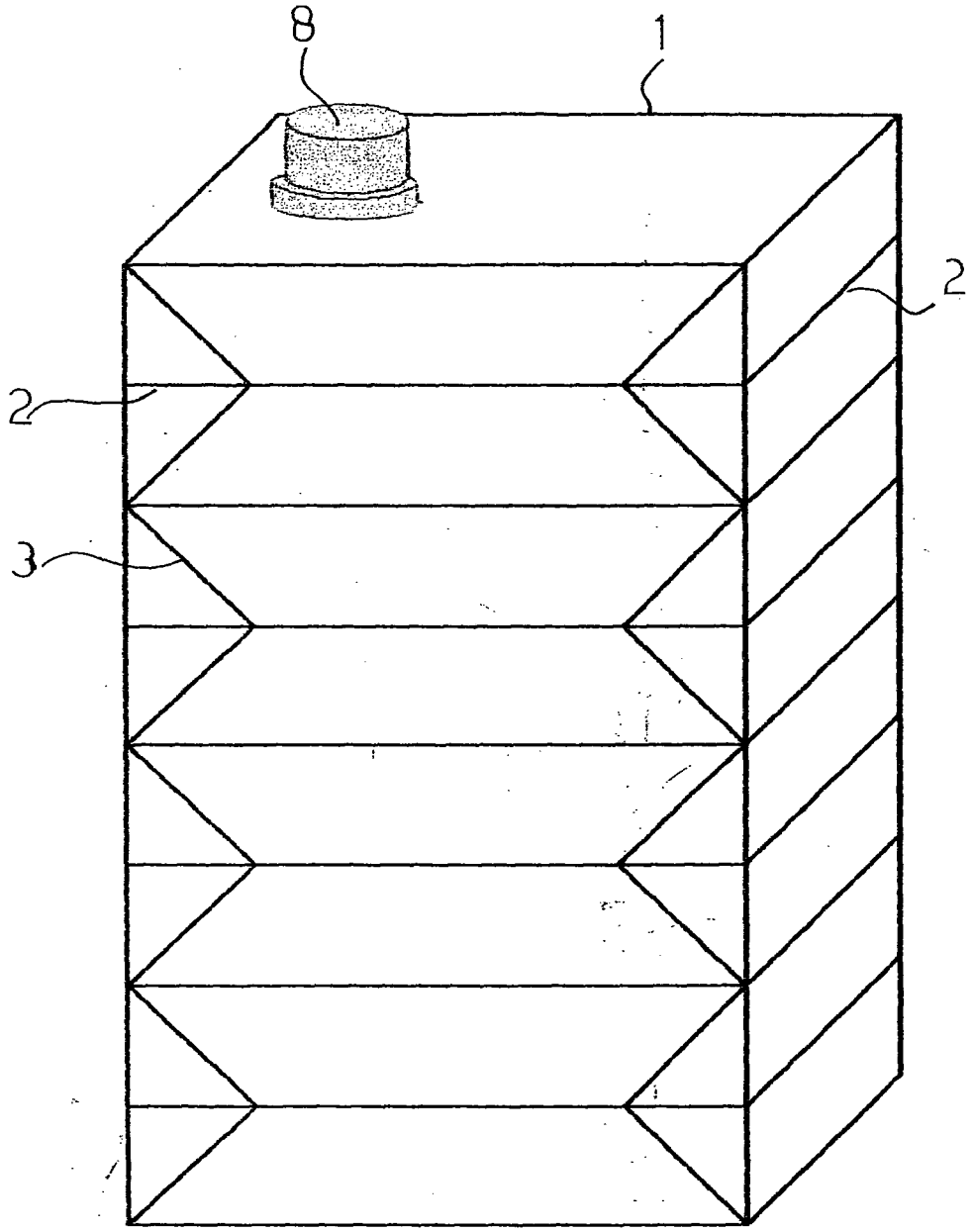


FIG.5

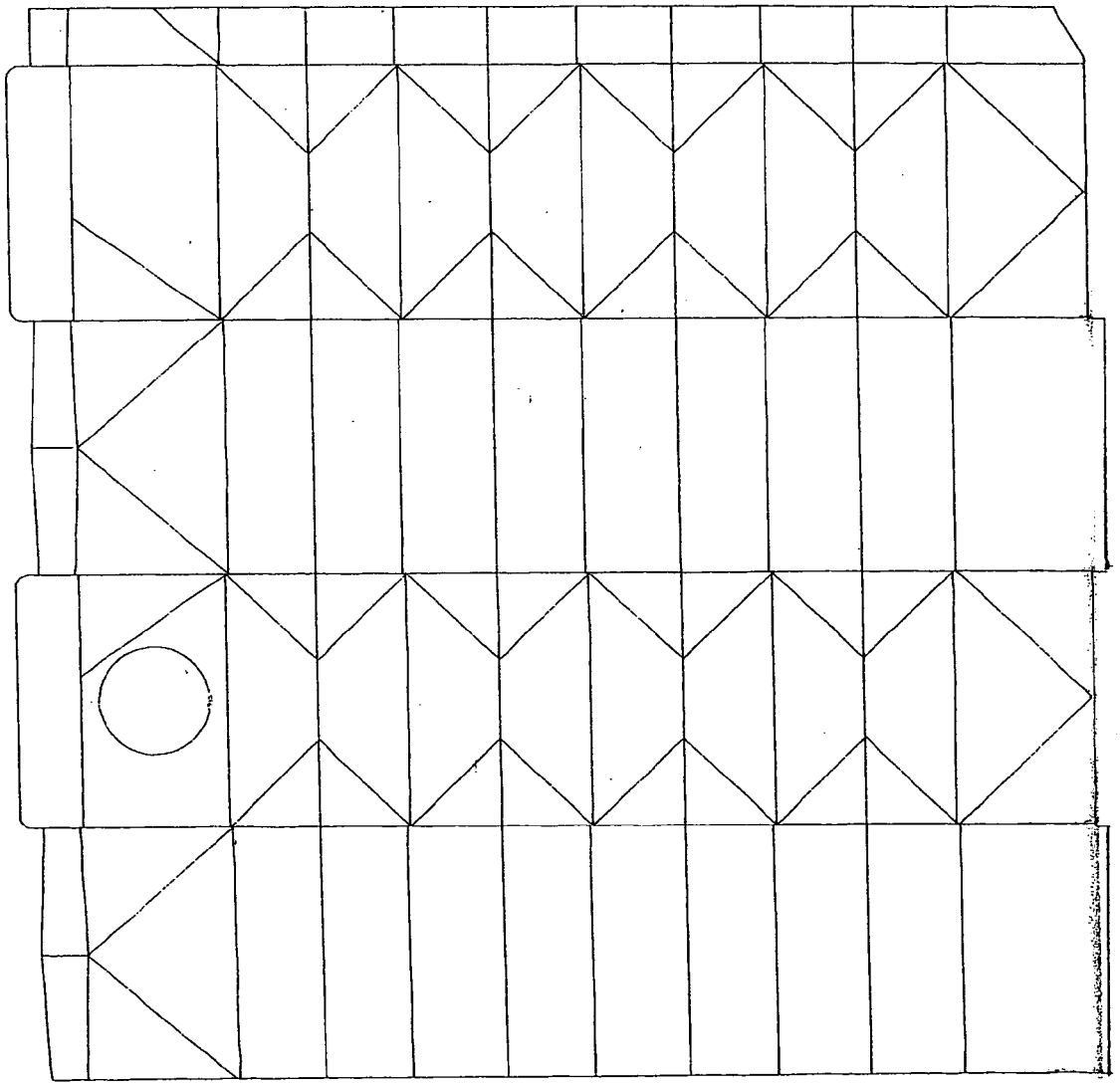


FIG.6

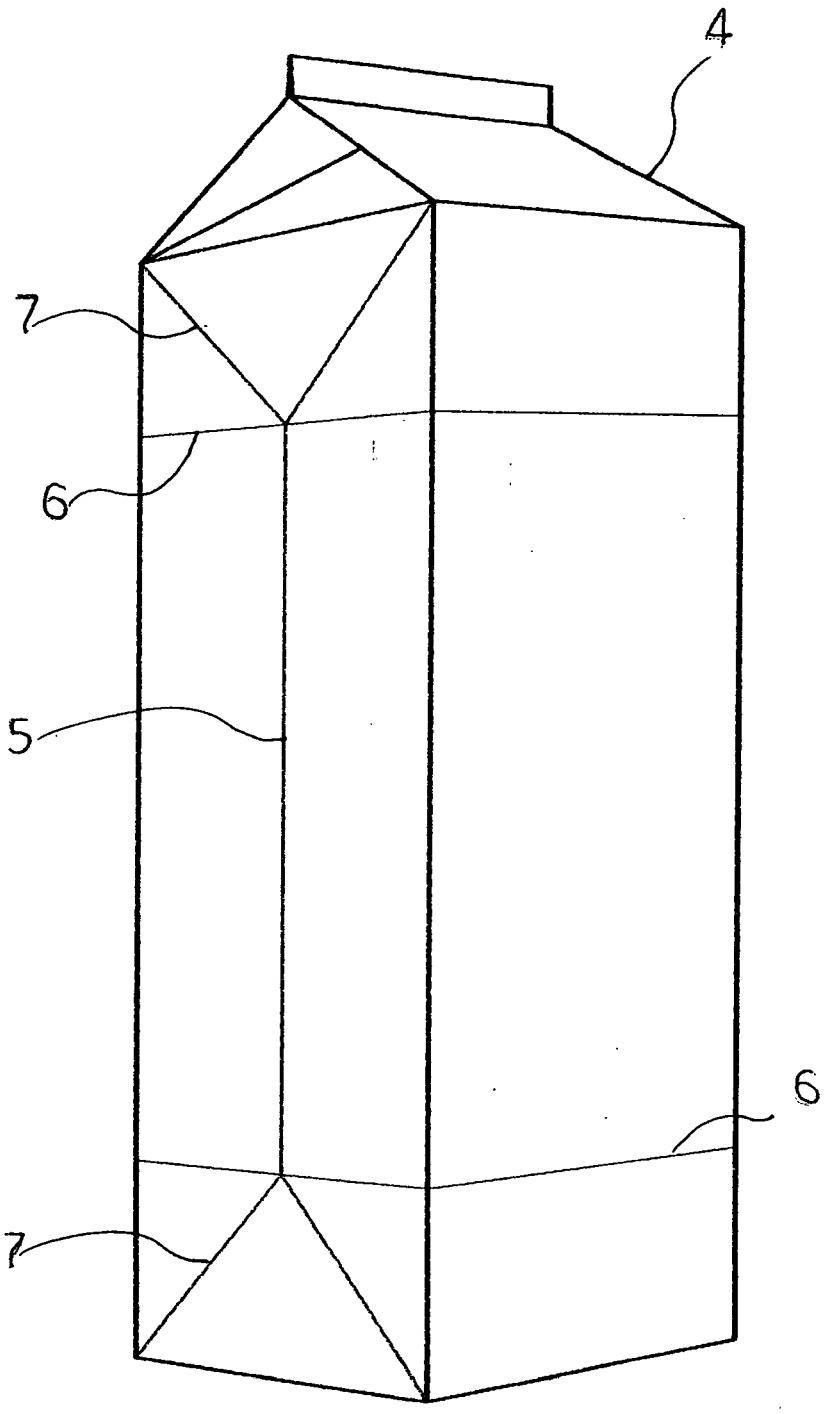


FIG.7

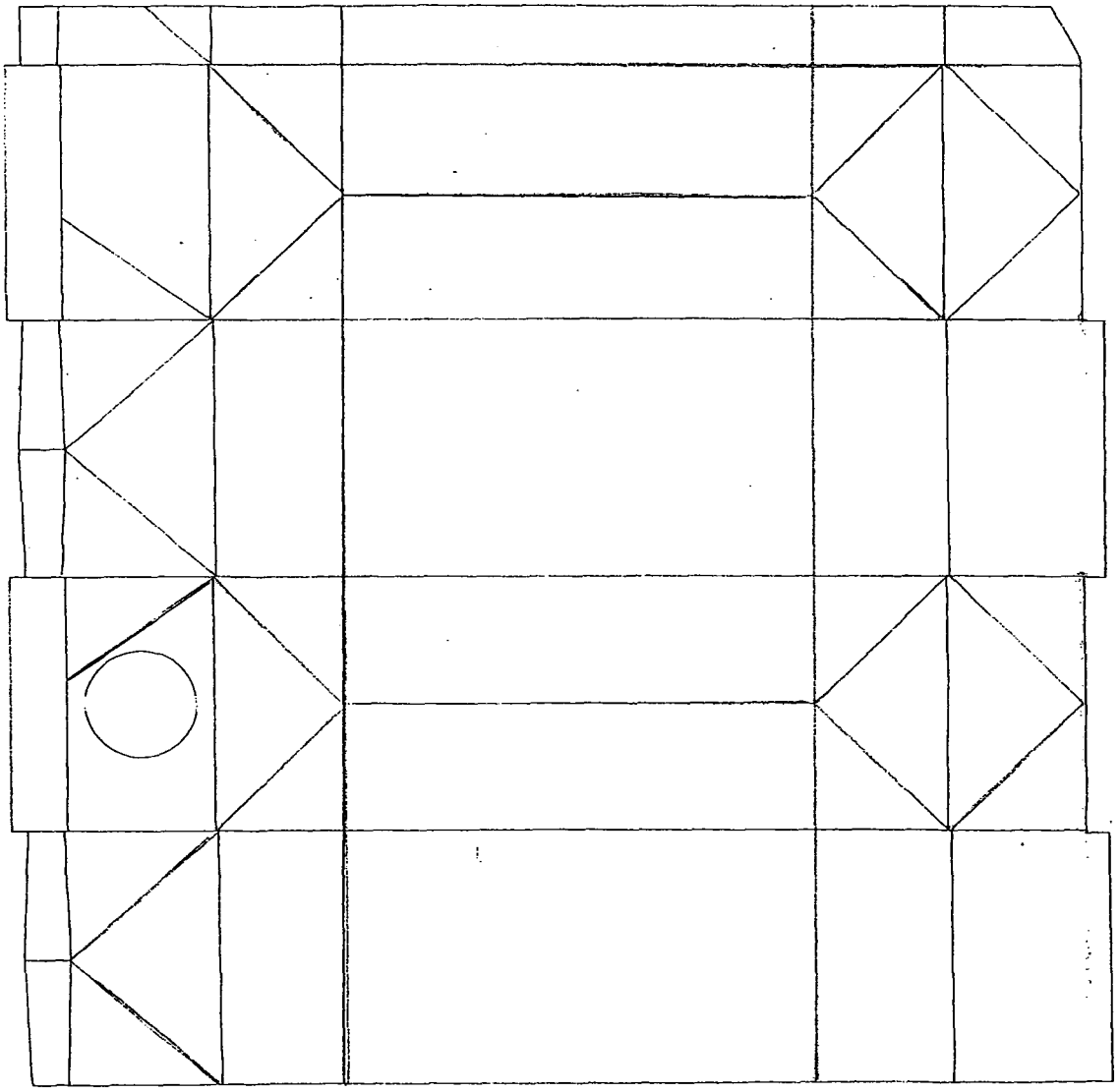


FIG. 8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5802

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 181 062 A (ARAI KOICHI) 15 April 1987 (1987-04-15) * page 2, line 12 - line 47; figures 5-8 *	1-7	INV. B65D5/355 B65D1/02
X	US 3 595 441 A1 (GROSJEAN ROBERT M) 27 July 1971 (1971-07-27) * the whole document *	2-7	
X	WO 00/43276 A (BROWN SCOTT [AU]) 27 July 2000 (2000-07-27) * page 4, line 24 - page 5, line 6 * * page 6, line 6 - page 7, line 27 * * figures 1-6 *	1,3-7	
X	JP 2002 225832 A (YOSHINO KOGYOSHO CO LTD) 14 August 2002 (2002-08-14) * abstract; figures 1-5 *	1,3-7	
X	DE 296 20 877 U1 (SIMKO ANDREJ [SK]) 13 February 1997 (1997-02-13) * the whole document *	1,3-7	TECHNICAL FIELDS SEARCHED (IPC)
X	US 5 975 411 A1 (WINDOLPH III JOHN F [US]) 2 November 1999 (1999-11-02) * the whole document *	1,3-7	B65D
X	AT 412 337 B (SCHLATTNER HERMANN [AT]) 25 January 2005 (2005-01-25) * abstract * * page 2, line 1 - page 3, line 37 * * figures 1-3 *	1,3,4,6,7	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 March 2007	Leijten, René

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 06 42 5802

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.

07-03-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2181062 A	15-04-1987	DE 3535653 A1	09-04-1987
		FR 2588472 A1	17-04-1987
US 3595441 A1		NONE	
WO 0043276 A	27-07-2000	NONE	
JP 2002225832 A	14-08-2002	NONE	
DE 29620877 U1	13-02-1997	NONE	
US 5975411 A1		NONE	
AT 412337 B	25-01-2005	AT 10832002 A	15-06-2004

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82