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(54) **Cardboard container for aseptic liquids**

(57) The present invention relates to an aseptic container with rectangular base obtained by folding a shaped

sheet provided with folding lines and reverse folding lines.

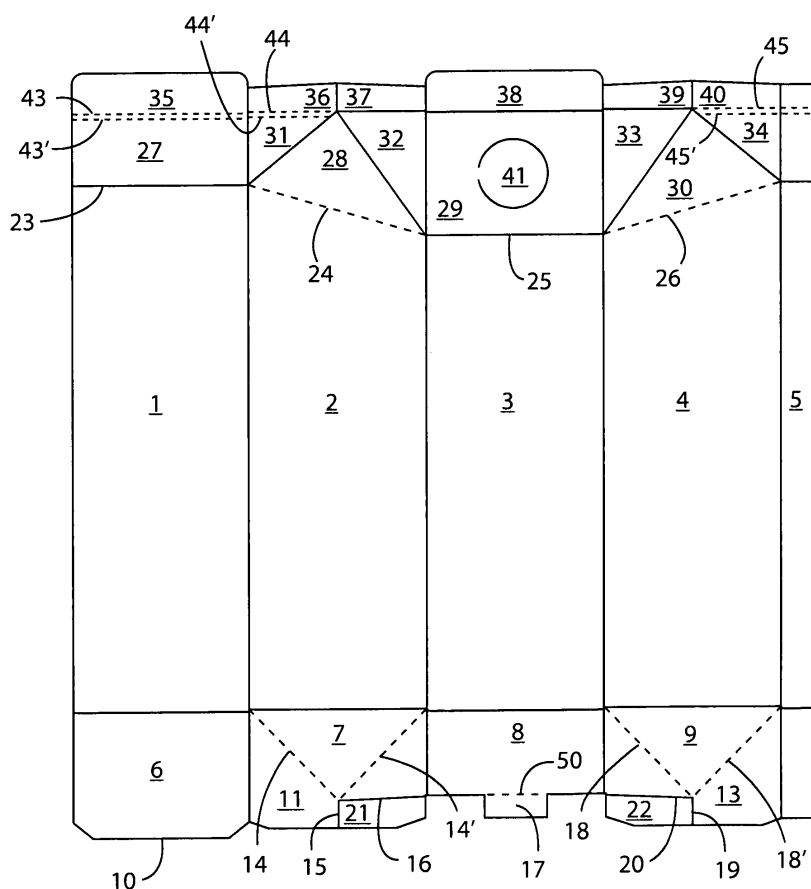


Fig. 1

Description

[0001] The present invention relates to a polyethylene cardboard aseptic container for the storage of long shelf life liquid food products.

[0002] More particularly, the invention relates to a food container, of the type having a prismatic final shape, manufactured in paper laminated with LDPE (low density polyethylene), EVA and/or EMA (adhesive ionomeric resins), both plastic and metal sheets barrier, LLDPE (linear low density polyethylene).

[0003] At present, there are different kinds of aseptic containers, the task of which is to preserve over time the nutritional value, the quality and taste of the product inside, protecting it from exposure to contaminants. In particular, this kind of container is used for the packaging of a wide range of products such as milk and dairy products, fruit juices, non carbonated drinks, wine, tomato sauce, etc.

[0004] However, an aseptic container must not only ensure the function of protecting the product contained therein against external agents, but also prevent the product can come into contact with surfaces of the container which are not compatible with the maintenance of aseptic conditions and in particular with the layer of paperboard which forms the support to the polyethylene coating film facing the interior of the container. In fact, along the edges of the polyethylene cardboard sheet forming the container, the inner layers thereof are not covered and, if they come into contact with the contents of the container, they could then abandon contaminants to it.

[0005] The purpose of the present invention is therefore to provide a polyethylene cardboard aseptic container allowing to overcome the limits of the solutions according to the prior art and to obtain the technical results previously described.

[0006] Further object of the invention is that said container can be manufactured with production costs substantially limited.

[0007] Another object of the invention is to provide a polyethylene cardboard aseptic container which is substantially simple, safe and reliable.

[0008] It is therefore a specific object of the present invention an aseptic bottom of a container with a rectangular base obtainable by folding a shaped sheet provided with folding lines and reverse folding lines, which includes four base portions delimited by folding lines and underlying respective four panels, delimited by folding lines and which form the side walls of said container, and with the respective base lines coincident to the base lines of said respective panels, along respective folding lines, a first base portion of rectangular shape, with height greater than half the length of the base line of an adjacent second base portion, and free of folding lines; a second base portion, coupled to said first base portion along a folding line, of rectangular shape with a height greater than half the length of the base of said adjacent first base

portion, with two reverse folding lines, which extend respectively from each one of the two angles at the base of said second base portion and which are joined along the median line of said base portion, at a distance from said base portion which is equal to half the length of the base line of said adjacent first base portion, said second base portion further comprising a terminal part, coupled to said second base portion along a first folding line, which from the point where said reverse folding lines are joined, following the median line of said base, reaches the terminal part of the base portion, and a second folding line, which from the point where said reverse folding lines are joined, following a line substantially perpendicular to the median line of said base portion, reaches the side of said second base portion, opposite to the side on which said folding line is located in common with said first base portion; a third base portion coupled to said second base portion along a folding line, having rectangular shape with a height dimension substantially equal to or slightly less than the half of the base of said adjacent second base portion, with a flap, joined to the end part of said third base portion along a folding line, and a fourth base portion, coupled to said third base portion along a folding line and symmetrical with respect to said second base portion.

[0009] Preferably, according to the present invention, said shaped sheet is made of polyethylene cardboard.

[0010] Moreover, always according to the invention, said flap can be rectangular in shape.

[0011] Finally, always according to the present invention, the sides of said rectangular base are all identical.

[0012] The present invention will be described in the following, for illustrative, non limitative purposes, according to a preferred embodiment, with reference in particular to the figures of the enclosed drawings, wherein

- figure 1 shows a top plan view of a shaped sheet for making an aseptic container according to the present invention,
- figure 2 shows a perspective view of the bottom of the shaped sheet of figure 1, the container forming procedure being almost at the end of the closing step,
- figure 3 shows a perspective view of the top of the shaped sheet of figure 1, during the container forming procedure,
- figure 4 shows a perspective view of the top of the shaped sheet of figure 1, at the end of the closing step of the container forming procedure, and
- figure 5 shows a perspective view of the top of the shaped sheet of figure 1, after shaping of the closed container.

[0013] Making reference to the figures, figure 1 shows the container in its flat form, i.e. when it is still a shaped sheet, whereas figures 2-5 show the same container pre-formed, more in particular, during the forming of the bottom of the container (figure 2) and during the forming (figure 3) and after the closing (figure 4) and the shaping

(figure 5) of the top of the container. The shaped sheet is divided into a plurality of portions by folding lines (crease) made on the sheet itself and represented by the lines within the outline. The crease lines represented by a continuous lines represent lines in correspondence of which a force is applied for folding such to push the two portions on the two sides of the line downwards with respect to the plane of the figure, whereas the dashed lines are crease lines to which a force is applied (for folding) with an opposite direction.

[0014] With reference to figure 2, in order to realise the bottom, the shape undergoes a first modification (in its form) coupling the portion 5 to the portion 1; it is then handled to obtain a shape more or less square (as shown in figure 2).

[0015] After applying hot air on the portions below the horizontal line, dividing the portions indicated with numerals 1, 2, 3, 4 from the portions indicated with numerals 5, 6, 7, 8 and 9, the real forming of the bottom occurs.

[0016] A force is applied to the portions 9 and 7, thus obtaining the forming of triangles causing the other portions to undergo the following:

- the flap 17 is folded on the crease 50 and leans on the portion 8;
- the triangles, formed by creases 14, 14' and 18, 18' with the lower parts of portions 4 and 2, receive the overlapping of the portions 13 and 11;
- the portions 21 and 22 are folded on the creases 16 and 20 and lean partly on the portion 17, partly on the portion 8;
- the lines 15 and 19, once the fold is occurred, match at the center of the flap 17;
- the portion 10, i.e. the end part of the portion 6, will lean on portions 11 and 13, which, in turn, will lean on portions 21 and 22.

[0017] Then, applying a pressure, using a suitably shaped plate, a partial fusion of all the coated layers of polymer will be caused.

[0018] This will avoid, in particular in this configuration, any point of contact between the food and the base structure of the container (paper), (unlike the bottoms of the bricks made to date; such bottoms, in fact, do not allow for an aseptic filling, since the liquid contents put into contact with the fibres of paper).

[0019] Also the liquid sealing will be improved, because more folded sheets will interpose to a possible passage.

[0020] With reference to figures 3-5, in order to make the top, after coupling of the portion 5 with the portion 1 and their manipulation to obtain a more or less square shape, and also after the application of hot air on the portions above the dashed line constituted by the folding lines 23, 24, 25 and 26, dividing respectively the portions indicated by the reference number 1, 2, 3, 4, the portions indicated with the references 27, 28, 29 and 30, the real forming of the top is achieved.

[0021] A force is applied on portions 27 and 29, forcing

the other portions to the following actions:

- the triangular portions 32 and 33 on both sides of portion 29 are arranged in line with portion 29 and at the same time the triangular portions 31 and 34 on both area of portion 27 are arranged in line with the portion 27;
- the triangular portions 28 and 30 are folded on the creases 24 and 26 and disposed respectively under their triangular portions 31 and 32 and the triangular portions 33 and 34;
- the flaps 36 and 40 on both sides of the flap 35 are arranged in line with the flap 35 and at the same time the flaps 37 and 39 on both sides of the portion 38 are arranged in line with the portion 38.

[0022] Then, by applying a pressure, by means of a suitably shaped plate, a partial fusion of all the polymer coated layers will be caused, respectively, of the flap consisting of portions 37, 38 and 39 and portions 40, 35 and 36, operating the closure of the top.

[0023] On the top there is a hole 41 arranged for the application of a screw cap 42.

[0024] Unlike the brick's tops produced until today; this top is characterized by the bending outward of the triangular portions 28 and 30, functional to the subsequent shaping which allows to obtain the container according to the present invention.

[0025] With reference to figure 5, such shaping is obtained by folding the flaps 37, 38 and 39 and 40, 35 and 36 so that they abut on the respective underlying portions 34, 27 and 31. This folding is facilitated by the addition of a further crease line to those commonly found in the shaped sheets according to the prior art, constituted by the segments 43', 44', 45' in addition to the crease line defined by the segments 43, 44, 45, respectively, between the flaps 35 and 27, 36 and 31, 40 and 34.

[0026] The fins formed on the sides of the top, constituted by portions 33 and 34 on one side of the top and from the portions 31 and 32 on the other, and from the respective flaps, are folded on the wall of the container, ie, up to rest on the respective underlying walls 4 and 2. The shaping is then completed by welding between the fins and the respective underlying walls 4 and 2.

[0027] It should be noted that the container can have different sizes, including the height of which may vary from 50 mm to 300 mm.

[0028] The present invention was described for illustrative non limitative purposes, according to preferred embodiments, but it has to be understood that any variations and/or modifications can be made by the skilled in the art without for this simple reason escaping the scope of protection defined by the enclosed claims.

Claims

1. Aseptic container with a rectangular base obtained

by folding a shaped sheet provided with folding lines and reverse folding lines, **characterised in that** it comprises a bottom defined by four base portions (6, 7, 8, 9) delimited by folding lines and underlying respective four panels (1, 2, 3, 4), delimited by folding lines and which form the side walls of said container, and with the respective base lines coincident to the base lines of said respective panels (1, 2, 3 and 4), along respective folding lines, a first base portion (6) of rectangular shape, with height greater than half the length of the base line of an adjacent second base portion (7), and free of folding lines; a second base portion (7), coupled to said first base portion (6) along a folding line, of rectangular shape with a height greater than half the length of the base of said adjacent first base portion (6), with two reverse folding lines (14), which extend respectively from each one of the two angles at the base of said second base portion and which are joined along the median line of said base portion (7), at a distance from said base portion which is equal to half the length of the base line of said adjacent first base portion (6), said second base portion further comprising a terminal part (21), coupled to said second base portion (7) along a first folding line (15), which from the point where said reverse folding lines (14) are joined, following the median line of said base line, reaches the terminal part of the base portion (7), and a second folding line (16), which, from the point where said reverse folding lines (14) are joined, following a line substantially perpendicular to the median line of said base portion, reaches the side of said second base portion (7), opposite to the side on which said folding line is located in common with said first base portion (6); a third base portion (8) coupled to said second base portion (7) along a folding line, having rectangular shape with a height dimension substantially equal to or slightly less than the half of the base of said adjacent second base portion (7), with a flap (17), joined to the end part of said third base portion (8) along a folding line (50); and a fourth base portion (9), coupled to said third base portion (8) along a folding line and symmetrical with respect to said second base portion (7).

2. Aseptic container with a rectangular base according to claim 1, **characterised in that** said zone a flap (17) is rectangular in shape.
3. Aseptic container with a rectangular base according to any of the previous claims, **characterised in that** the sides of said rectangular base are all identical.
4. Aseptic container with a rectangular base according to any of the previous claims, **characterised in that** said shaped sheet is made of polyethylene cardboard

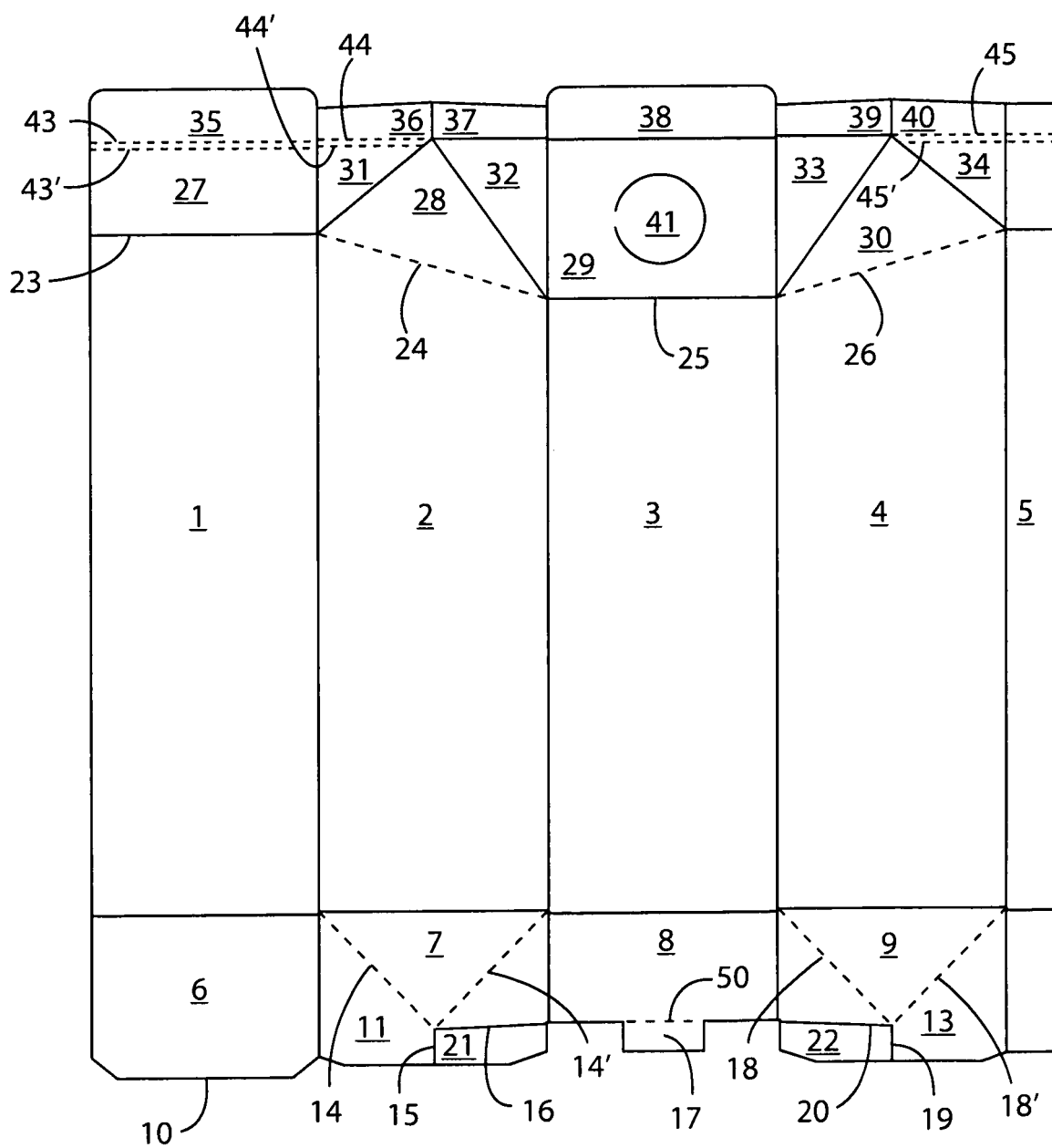


Fig. 1

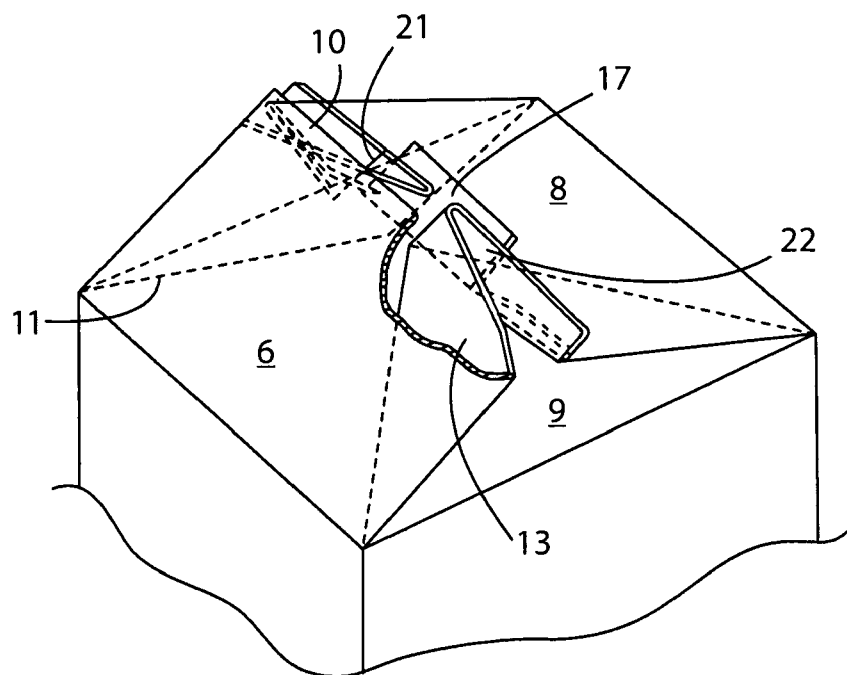


Fig. 2

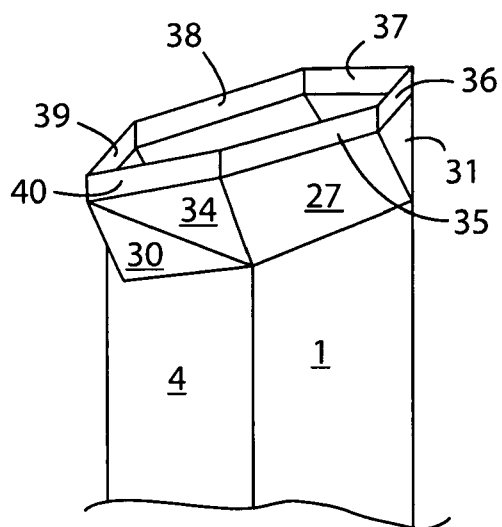


Fig. 3

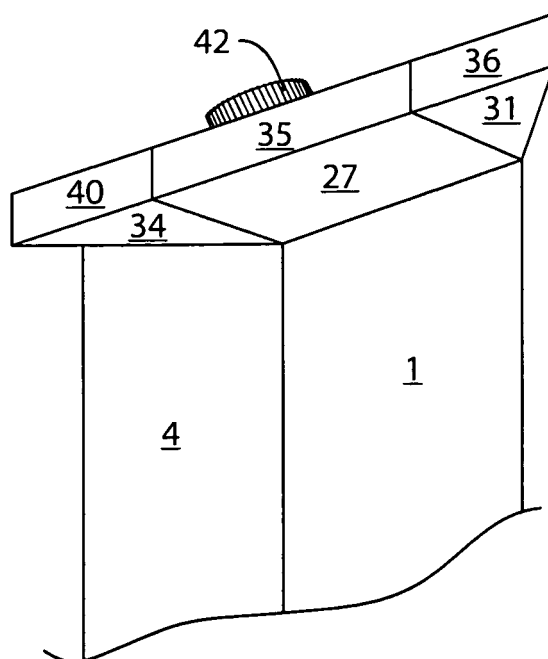


Fig. 4

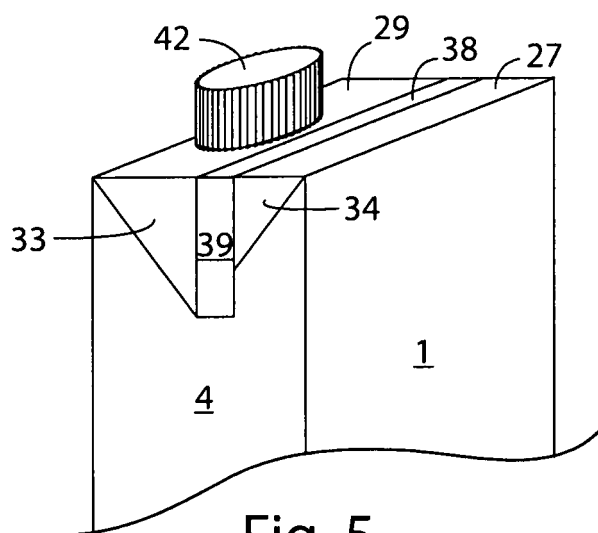


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 12 42 5003

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	US 6 328 204 B1 (STACY-RYAN RUSSELL [US]) 11 December 2001 (2001-12-11) * column 4, line 11 - column 5, line 63; figures 1-9 *	1-4	INV. B65D5/06 B65D5/74
A	WO 2009/004334 A1 (ELOPAK SYSTEMS [CH]; BURROWS ANTHONY GREGORY [GB]; THINGELSTAD LARS AK) 8 January 2009 (2009-01-08) * abstract; figure 5 *	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 5 April 2012	Examiner 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			

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

EP 12 42 5003

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
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05-04-2012

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6328204	B1	11-12-2001	AT 330855 T	15-07-2006
			AU 7594201 A	05-02-2002
			DE 60120995 T2	05-10-2006
			EP 1313646 A1	28-05-2003
			JP 2005503293 A	03-02-2005
			US 6328204 B1	11-12-2001
			WO 0208069 A1	31-01-2002

WO 2009004334	A1	08-01-2009	AT 538042 T	15-01-2012
			AU 2008272746 A1	08-01-2009
			CN 101778773 A	14-07-2010
			EP 2164758 A1	24-03-2010
			JP 2010531787 A	30-09-2010
			KR 20100038388 A	14-04-2010
			RU 2010103295 A	10-08-2011
			US 2010270366 A1	28-10-2010
			WO 2009004334 A1	08-01-2009
