Abstract: A drinks pouch comprising an internal cavity suitable for containing a drink, the cavity being defined by one or more walls which encloses the cavity. At least part of the wall is constructed from a heat bondable plant packaging material such as a laminate which is shaped and sealed to form a pouch. A drinking straw is sealed within the cavity in a channel which is formed by heat bonding together parts of the plant packaging. An openable section for opening the drinks pouch is located near the channel, which when opened creates a hole which allows access to the drink in the cavity. The channel is positioned to guide the straw through the hole when the pouch has been opened.
Pouch for Liquids and Method for Making the Same

Introduction

The present invention relates to a liquid container in the form commonly referred to as drinks pouch and a method for making the container.

Background

Drinks such as, for example, water, fruit juice, still and carbonated soft drinks, beer and wine are made available for purchase in a number of different types of container. A particular market segment comprises drinks which are available in volumes typically of between 150ml to 500ml and which provide a suitable volume for one person. Such drinks may be sold in containers such as aluminium cans, bottles, cartons or pouches. In most cases, cartons and pouches are sold with a straw attached to their outside. In use, the straw is pierced through a membrane which is thinner or made of weaker material than the rest of the carton or pouch, thereby allowing the straw to be inserted into the carton or pouch to allow a person to drink from it.

Drinks pouches as distinct from cartons, are characterised by having a flexible, soft, pliant, squeezable body which may be made from an aluminium foil and/or a suitable plastic. For example, a drinks pouch may comprise a triplex laminate made from layers of Polyethylene Terephthalate (PET), foil and a sealant layer bonded together. A secondary strip of polyethylene is provided on one side of the pack and heat-sealed around a hole in the triplex laminate to ensure it remains water-tight. When filled and formed these packs then have a straw attached to the back of the pack. The straw is used to puncture the secondary strip to access the contents of the pouch.

Pouches with straws are most popular where the drinks have particular appeal for children. One reason for this is that, in comparison with bottles and cans, children find it significantly easier to drink from a straw without spilling the drink.
However, the process of inserting the straw into the drink container may lead to spillages. For example, in order to access the drink, a person must remove the straw from the back of the pack, take the protective sleeve from around the straw then pierce the polyethylene strip with the straw. It is very difficult for most people and especially children to accomplish this without squeezing the pouch whilst piercing it thereby causing the contents to spill out from the hole made or through the straw.

The design of these pouches means that few companies are able to manufacture the pouches and the costs associated with both the production of the pouch material and their further conversion and filling are considerable.

US 2011/0215107 A1 describes a drinks container with a water outlet vertically cut through the bottom wall of the container from which water may exit the container into a channel which extends to a suction hole at the top of the container. In this case the channel and suction hole are built into the container.

US 6,912,825 B2 discloses a liquid pouch formed from sheet material which contains an internal straw restraining passage which retains an axially displaceable straw captive internally in the straw restraining passage. Opening the pouch causes the internal straw to emerge from the pouch due to the buoyancy of the straw. As shown in figures 1 and 9 of US 6,912,825 B2, the straw restraining passage 58 is formed, prior to assembly of the pouch by creating a raised portion (56) on each opposed side wall (40) of the sheet material (2), the raised portion having a slightly higher elevation than a substantial portion of a remainder of said sheet material (2).

The raised portions are created using an extra layer of sheet material or, for example, by placing a quantity of fast drying adhesive or silicone on the sheet material. When the pouch is formed, the space between the raised portion and the side wall of the pouch forms a straw restraining passage. The embodiments shown in US 6,912,825 B2 show a relatively short straw retaining portion with a straw positioned diagonally across the pouch. The short passage design ensures the correct alignment of the raised portions which is much harder to achieve with longer passages. The addition of material to the pouch for the creation of the restraining
passage adds material cost and complexity to the process of creating the pouch and there is a risk of contamination of the pouch contents in particular where silicone or an adhesive is used.

Summary of the Invention

It is an object of the present invention to provide an improved drinks pouch which has a straw sealed into the pouch with the drink.

It is another object of the present invention to provide an improved drinks pouch in which, upon opening the pouch, an end of the straw moves out from the pouch to allow a person to drink from the pouch using the straw.

In accordance with a first aspect of the invention there is provided a drinks container comprising:
an internal cavity suitable for containing a drink, the cavity being defined by one or more wall which encloses the cavity, at least part of the wall being constructed from a heat bondable pliant packaging material;
a drinking straw, sealed within the cavity,
an openable section of the one or more wall for opening the pouch which when opened creates a hole which allows access to the drink in the cavity;
one or more heat seal formed between parts of the pliant packaging material to define a channel in which at least part of the straw is located, the channel being positioned to guide the straw through the hole when the pouch has been opened.

Preferably the heat seal is linear in shape.

Preferably, the pouch comprises a front wall and a rear wall, the perimeters of which are sealed to form top, bottom and side sealed edges of the pouch,

Preferably, the bottom sealed edges comprises a gusset bottom.
Preferably, the channel is formed between the side edge at which the openable section is formed.

Preferably, the heat seal is a linear heat seal which seals together a linear portion of the front and rear walls and which extends partly down the length of the pouch.

Preferably, the top, bottom and side sealed edges are sealed using a heat seal.

Preferably, the openable section comprises a tearable corner section formed between a top edge and a side edge of the pouch.

Alternatively, the openable section comprises a cap with an airtight seal.

Preferably, the linear heat seal extends from the top sealed edge to more than 50% of the length of the pouch.

Alternatively, the linear heat seal extends from below top sealed edge to more than 50% of the length of the pouch.

Preferably, the channel is formed at or near an openable section away from the side edges of the pouch and comprises two linear heat seals which are substantially parallel to one another and which seal together linear portions of the front and rear walls and which extends partly down the length of the pouch.

Preferable the pliant packaging material is a foil laminate having two or preferably three layers.

Preferably, the pliant packaging material comprises one or more of the following materials, which may be laminated together. Polyethyleneterephthalate (PET), and printed on the reverse but other materials could be used including orientated polypropylene (OPP), cast polypropylene (CPP), orientated polyamide (OPA), polyethylene (PE), paper or aluminium foil.
Preferably, the heat seal extends from the top seal a predetermined distance down
the length of the pouch at a suitable distance laterally displaced from channel edge
seal.

Preferably, the length of the channel is selected to accommodate most or all of the
length of the straw which assists with guiding the straw to the opening in the pouch.

Preferably, the channel length is selected to ensure that the straw is guided up and
through the opening.

Preferably, the channel acts to funnel liquid towards the straw.

Preferably, openable section may be created by means of mechanical, heat,
 electrical or laser method.

In accordance with a second aspect of the invention there is provided a method for
creating a drink pouch which has a straw containing channel, the method comprising
the steps of:
forming a laminate having an inner layer and an outer layer
shaping the laminate into a drinks pouch with a front face and a rear face;
heat sealing together at least one edge of the front and the rear face to form the
pouch with a cavity between the front and rear faces, the pouch having an openable
section;
applying a second heat seal between the front face and the rear face to form the
straw containing compartment, the compartment being positioned at or near the
openable portion of the pouch.

Preferably, the laminate is mounted on a reel prior to folding.

Preferably the method further comprises inserting a straw into the compartment

Preferably the method further comprises filling the pouch with a suitable liquid.
Preferably the method further comprises applying a gas overpressure to the cavity and sealing the pouch such that the gas pressure in the pouch is greater than the anticipated external atmospheric pressure.

5 Preferably the anticipated external atmospheric pressure is airline cabin pressure.

Preferably the step of laminating comprises adding a third layer to the laminate.

Preferably, the step of folding the laminate creates a 3 sided pouch.

10 Preferably, the step of shaping the laminate comprises folding the laminate.

Brief Description of the Drawings

15 The present invention will now be described by way of example only, with reference to the accompanying drawings in which:

Figure 1A is a side view of a first embodiment of a drinks pouch in accordance with the present invention, figure 1B is an end view of the pouch of figure 1A and figure 1C;

Figure 2 is a side view of a second embodiment of a drinks pouch in accordance with the present invention;

20 Figure 3 is a side view of a third embodiment of a drinks pouch in accordance with the present invention;

Figure 4A is a side view of a first embodiment of a drinks pouch in accordance with the present invention and figure 4B is an end view of the pouch of figure 4A;

25 Figure 5A is a side view of a first embodiment of a drinks pouch in accordance with the present invention and figure 5B is an end view of the pouch of figure 5A;
Figure 6 is a diagram showing the net of a drinks pouch similar to that shown in figure 1; and

Figure 7a is a schematic diagram showing an example of a process for making a drinks pouch in accordance with the present invention with figure 7b showing in detail the feature A of figure 7a.

**Detailed Description of the Drawings**

Figure 1 shows a pouch 1 with a top seal 3 and side seals 5. The seals are formed in a heat seal machine. The pouch also has a standard gusset bottom 7 which is shaped to enable the pouch to stand up on its end. The front 10 and rear 13 faces of the pouch are shown in figures 1B and 1C. In this embodiment, the pouch is made from a triplex foil laminate. In other embodiments of the invention, other suitable heat bondable materials may be used. A tearable corner 9 is provided by a seam-like indentation which extends from the top seal 3 to the side seal 5 at a top corner of the pouch 1. The liquid level 15 is shown and an air gap is typically present at the top of the pouch 1 when it is in an upright position.

Channel 17 is positioned to the side of the pouch 1 and extends below the tearable corner 9 and accommodates a straw 25. In this example of the present invention, the channel 17 is defined by the front 10 and rear faces of the pouch and by sealing edges 19 and 21. Channel sealing edge 19 is created using a heat seal to bond together a linear section of the front 10 and rear 13 faces of the pouch 1. The creation of the channel 17 by sealing together a length of the front 10 and rear 13 of the pouch gives the channel a generally oval shape when in use.

The sealing edge 19 extends from the top seal 3 a predetermined distance down the length of the pouch at a suitable distance laterally displaced from channel edge seal 21. The length of the channel 17 may be selected to accommodate most or all of the length of the straw which assists with guiding the straw to the opening in the pouch.

In this example of the present invention, channel edge seal 21 comprises the side seal 5 of the pouch 1. It will be appreciated that the length of the channel is defined
by the length of channel edge seal 19 which terminates at the open end of the channel 23. The channel length is selected to ensure that the straw 25 may be guided up and through the opening once the tearable corner 9 has been removed. This means that the channel must extend down the length of the straw a sufficient distance so that if the straw is not parallel with the channel it will not make an angle with the side of the channel which would prevent the straw from emerging from the opened pouch 1.

In addition, the channel serves another purpose in that it acts as a funnel. In other, known types of pouch it may be difficult to get some liquid out of the pouch via the straw when most of the liquid has been consumed. The creation of a channel 17 acts to collect liquid making it easier to drink.

The side view of figure 1B shows the position of the channel 17, similarly, the plan view of figure 1C shows the substantially oval shape of the channel caused by the creation of edge seals 19 and 21 which also distorts the shape of the pouch adjacent to the edge seal 19 but less so towards the base of the pouch.

Figure 2 shows a second embodiment of the present invention which comprises a pouch 31 with a top seal 33 and side seals 35. The pouch 31 also has a standard gusset bottom 37 which is shaped to enable the pouch to stand up on its end. A tearable corner 39 is provided by a seam-like indentation which extends from the top seal 33 to the side seal 35 at a top corner of the pouch 31. The liquid level 45 is shown and an air gap is present at the top of the pouch 31 when it is in an upright position.

Channel 47 is positioned to the side of the pouch 31 and extends below the tearable corner 39 and accommodates a straw 55. In this example of the present invention, the channel 47 is defined by the front 40 and rear faces of the pouch and by sealing edges 49 and 51. Channel sealing edge 49 is created using a heat seal to bond together a linear section of the front 40 and rear 43 of the pouch 30. In this case, the channel sealing edge 49 intersects with the tearable corner at 57 and the channel is narrower than that shown in figure 1A. A narrower channel restricts lateral movement of the straw in the pouch.
The sealing edge 49 extends from the top seal 33 a predetermined distance down the length of the pouch at a suitable distance laterally displaced from channel edge seal 51. The length of the channel 47 may be selected to accommodate most or all of the length of the straw which assists with guiding the straw to the opening in the pouch 31.

Figure 3 shows a third embodiment of the present invention which comprises a pouch 61 with a top seal 63 and side seals 65. The pouch 61 also has a standard gusset bottom 67 which is shaped to enable the pouch to stand up on its end. The pouch 61 may be made from a foil laminate having two or preferably three layers. A tearable corner 69 is provided by a seam-like indentation which extends from the top seal 63 to the side seal 65 at a top corner of the pouch 61. The liquid level 65 is shown, typically an air gap is present at the top of the pouch 61 when it is in an upright position.

Channel 77 is positioned to the side of the pouch 61 and begins at a predetermined distance below the top seal 63 then extends below the tearable corner 69 and accommodates a straw 75. In this example of the present invention, the channel 77 is defined by the front 70 and rear faces of the pouch and by sealing edges 79 and 81. Channel sealing edge 79 is created using a heat seal to bond together a linear section of the front 70 and rear 73 of the pouch 60. In this case, the channel sealing edge 79 intersects with the tearable corner at 57.

Figures 4A and 4B show a fourth embodiment of the present invention which comprises a pouch 91 with a top seal 93 and side seals 95. The pouch 91 also has a standard gusset bottom 97 which is shaped to enable the pouch to stand up on its end. The pouch 91 may be made from a foil laminate having two or preferably three layers. In this example of the present invention, the opening comprises a screw cap 99.

Channel 107 is positioned to the side of the pouch 91 and begins at a predetermined distance below the top seal 93 then extends below the screw cap 99 and accommodates a straw 105. In this example of the present invention, the channel
107 is defined by the front 100 and rear faces of the pouch and by sealing edges 109 and 111. Channel sealing edge 109 is created using a heat seal to bond together a linear section of the front 100 and rear 103 of the pouch 91.

Figures 5A and 5B show a fifth embodiment of the present invention which comprises a pouch 121 with a top seal 123 and side seals 125. The pouch 121 also has a standard gusset bottom 127 which is shaped to enable the pouch to stand up on its end. The pouch 121 may be made from a foil laminate having two or preferably three layers. In this example of the present invention, the opening comprises a screw cap 99. Channel 137 is positioned in the centre of the pouch. Therefore in this example of the present invention, the channel is defined by channel sealing edges 139 and 141 both of which are created using a linear heat seal.

The net 151 of an example of a drinks pouch in accordance with the present invention is illustrated in figure 6. The net shows the pouch front 153, the pouch rear 155, perimeter seals 157, bottom edge seals 161 a crease 163 where the bottom of the pouch is folded and a tearable corner 165.

In the embodiments shown above, the pouch is opened by tearing the tearable corner or by removal of the cap. In these cases, the pouch is sealed with a gas pressure in the sealed pouch which is slightly higher than normal atmospheric pressure and upon opening the pouch, equalisation of the pressure with the surrounding atmosphere urges the straw up through the channel so that it extends outwards from the opening in the pouch. The channel acts to guide the straw to the hole. In addition, once the drink has been mostly consumed, if the pouch is tipped up to present the remaining liquid to the channel, the channel acts as a funnel for the remaining liquid. The value of the above described overpressure may be set to take account of the ambient pressure in locations such as aircraft cabins.

A drinks container made in accordance with the present invention may be produced in large numbers in a manufacturing process using a heat seal machine. The heat seal machine uses a role of filmic material to which print has been applied and which is folded, cut and sealed to form a drinks container in accordance with the present
invention. An example of a process for creating a container in accordance with the present invention is provided below and with reference to figure 6.

1. Print the outer cover or filmic layer. Print may be added to the front and read faces of the filmic layer. The filmic layer may comprise Polyethylene terephthalate (PET) or other materials such as orientated polypropylene (OPP), cast polypropylene (CPP), orientated polyamide (OPA), polyethylene (PE), paper or aluminium foil.

2. This outer cover would then be further laminated a material such as one of the materials above.

3. Further lamination can also be done to create a triplex laminate structure dependant on end user requirements.

4. This finished material is contained on a reel which is loaded onto a heat seal machine for conversion into a 3-side sealed pouch with a secondary seal running short of the full length of the pouch and within a void where a straw can be inserted or placed before, during or after pouch forming. As illustrated generally by figure 7a which is a schematic diagram of the process steps required to create a heat seal machine. The diagram 141 shows a reel 173 from which a flat sheet of laminated material 175 is unwound. The sheet is folded 177 as it is unwound from the reel to form the front rear and bottom surfaces of a container. Heat seals 181 are applied in positions which define the edges of a single container and at the bottom forming the base (not shown) and a second heat seal 183 is created which extends part of the way down the length of the container to define the channel in which the straw is to be inserted. Each container is cut 188 from the reel and a straw 187 is inserted as shown in figure 6b.

5. With the straw in place in this void the pouch can then be filled with the required liquid to the required level.

6. Final seal applied to the open part of the pouch. The pouch seals on all side would be of a welded bond strength <600gf/25mm.
7. The pouch is opened using a pre-scored tear away piece 157 in the corner which provides access into the channel where the straw has been placed. This access point and scoring can be created by means of mechanical, heat, electrical or laser method.

Improvements and modifications may be incorporated herein without deviating from the scope of the invention.
Claims

1. A drinks pouch comprising:
an internal cavity suitable for containing a drink, the cavity being defined by one or
more wall which encloses the cavity, at least part of the wall being constructed from
a heat bondable pliant packaging material;
a drinking straw, sealed within the cavity,
an openable section of the one or more wall for opening the drinks pouch which
when opened creates a hole which allows access to the drink in the cavity;
one or more heat seal formed between parts of the pliant packaging material to
define a channel in which at least part of the straw is located, the channel being
positioned to guide the straw through the hole when the pouch has been opened.

2. A drinks container as claimed in claim 1 wherein the heat seal is linear in
shape.

3. A drinks pouch as claimed in any preceding claim which comprises a front
wall and a rear wall, the perimeters of which are sealed to form top, bottom and side
sealed edges of the pouch,

4. A drinks pouch as claimed in claim 3 wherein, the bottom sealed edges
comprises a gusset bottom.

5. A drinks pouch as claimed in any preceding claim wherein, the channel is
formed between the side edge at which the openable section is formed.

6. A drinks pouch as claimed in any preceding claim wherein, the heat seal is a
linear heat seal which seals together a linear portion of the front and rear walls and
which extends partly down the length of the pouch.

7. A drinks pouch as claimed in claim 3 wherein, the top, bottom and side sealed
edges are sealed using a heat seal.
8. A drinks pouch as claimed in any preceding claim wherein, the openable section comprises a tearable corner section formed between a top edge and a side edge of the pouch.

9. A drinks pouch as claimed in claims 1 to 7 wherein, the openable section comprises a cap with an airtight seal.

10. A drinks pouch as claimed in claim 2 and claim 6 wherein, the linear heat seal extends from the top sealed edge to more than 50% of the length of the pouch.

11. A drinks pouch as claimed in claim 2 and claim 6 wherein, the linear heat seal extends from below top sealed edge to more than 50% of the length of the pouch.

12. A drinks pouch as claimed in any preceding claim wherein, the channel is formed at or near an openable section away from the side edges of the pouch and comprises two linear heat seals which are substantially parallel to one another and which seal together linear portions of the front and rear walls and which extends partly down the length of the pouch.

13. A drinks pouch as claimed in any preceding claim wherein the pliant packaging material is a foil laminate having two or preferably three layers.

14. A drinks pouch as claimed in any preceding claim wherein, the pliant packaging material comprises one or more of the following materials, which may be laminated together, Polyethyleneterephthalate (PET), orientated polypropylene (OPP), cast polypropylene (CPP), orientated polyamide (OPA), polyethylene (PE), paper or aluminium foil.

15. A drinks pouch as claimed in claims 1 to 11, 13 and 14 wherein, the heat seal extends from the top seal a predetermined distance down the length of the pouch at a suitable distance laterally displaced from channel edge seal.
16. A drinks pouch as claimed in any preceding claim wherein, the length of the channel is selected to accommodate most or all of the length of the straw which assists with guiding the straw to the opening in the pouch.

17. A drinks pouch as claimed in any preceding claim wherein, the channel length is selected to ensure that the straw is guided up and through the opening.

18. A drinks pouch as claimed in any preceding claim wherein, the channel acts to funnel liquid towards the straw.

19. A drinks pouch as claimed in any preceding claim wherein the openable section may be created by means of mechanical, heat, electrical or laser method.

20. A method for creating a drink pouch which has a straw containing channel, the method comprising the steps of:
forming a laminate having an inner layer and an outer layer
shaping the laminate into a drinks pouch with a front face and a rear face;
heat sealing together at least one edge of the front and the rear face to form the pouch with a cavity between the front and rear faces, the pouch having an openable section;
applying a second heat seal between the front face and the rear face to form the straw containing compartment, the compartment being positioned at or near the openable portion of the pouch.

21. A method as claimed in claim 20 wherein the laminate is mounted on a reel prior to folding.

22. A method as claimed in claim 20 and 21 wherein the method further comprises inserting a straw into the compartment

23. A method as claimed in claims 20 to 22 wherein the method further comprises filling the pouch with a suitable liquid.
24. A method as claimed in claims 20 to 22 wherein the method further comprises applying a gas overpressure to the cavity and sealing the pouch such that the gas pressure in the pouch is greater than the anticipated external atmospheric pressure.

25. A method as claimed in claim 24 wherein, the anticipated external atmospheric pressure is airline cabin pressure.

26. A method as claimed in claims 20 to 25 wherein, the step of laminating comprises adding a third layer to the laminate.

27. A method as claimed in claims 20 to 26 wherein, the step of folding the laminate creates a 3 sided pouch.

28. A method as claimed in claims 20 to 27 wherein the step of shaping the laminate comprises folding the laminate.
A. CLASSIFICATION OF SUBJECT MATTER

INV. B65D77/28
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

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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</thead>
<tbody>
<tr>
<td>X</td>
<td>US 5 884 758 A (SIGOuin CLAire C [CA] ET AL) 23 March 1999 (1999-03-23)</td>
<td>1-3, 5, 6, 10, 11, 15-20</td>
</tr>
<tr>
<td>A</td>
<td>column 3, line 1 - column 4, line 8</td>
<td>9</td>
</tr>
<tr>
<td>A</td>
<td>column 4, line 51 - column 5, line 51</td>
<td>4, 7, 8, 12, 14, 21-28</td>
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<tr>
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<td>figures 1-12</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>paragraphs [0014], [0028], [0033] - [0035]; figures 1-9</td>
<td>9-14, 16, 18, 21-28</td>
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</tbody>
</table>

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

A* document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search
16 March 2016

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Name and mailing address of the ISA/
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Weyand, Tim
<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
</table>
| X        | WO 00/59802 A1 (BEVERAGGI PASCAL [FR])
12 October 2000 (2000-10-12)
page 12, line 19 - page 13, line 21
page 19, line 20 - page 20, line 12
page 21, line 21 - page 21, line 28
page 29, line 1 - page 30, line 22
figures 1-17 | 1-8, 13-28 |
| A        | WO 2007/002292 A2 (WFCP LLC [US]; ROGERS WILLIAM D [US])
4 January 2007 (2007-01-04)
page 2, line 15 - page 3, line 16; figures 1,2 | 9 |
| A        | US 6 076 664 A (YEAGER JAMES W [US])
20 June 2000 (2000-06-20)
column 1, line 61 - column 2, line 9
page 3, line 1 - page 3, line 12
column 4, line 40 - column 4, line 43
column 5, line 48 - column 5, line 53
column 6, line 17 - column 6, line 29
figures 1-8 | 1-8, 10-28 |
| X        | GB 980 859 A (ROBINSON WAXED PAPER CO LTD)
20 January 1965 (1965-01-20)
the whole document | 1-4,12, 14 |
| A        | US 3 144 976 A (FRESHOURL OREN A)
18 August 1964 (1964-08-18)
the whole document | 1-28 |
| A        | WO 96/15040 A1 (JAMISON MARK D [US])
23 May 1996 (1996-05-23)
the whole document | 1-28 |
<table>
<thead>
<tr>
<th>Patent document cited in search report</th>
<th>Publication date</th>
<th>Patent family member(s)</th>
<th>Publication date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>US 5884758 A</td>
<td>23-03-1999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2003221393 A1</td>
<td>04-12-2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AU 3823500 A</td>
<td>23-10-2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DE 60017887 D1</td>
<td>10-03-2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 0059802 A1</td>
<td>12-10-2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BR P10612111 A2</td>
<td>19-10-2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA 2612940 A1</td>
<td>04-01-2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CN 101203440 A</td>
<td>18-06-2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1893520 A2</td>
<td>05-03-2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2008546609 A</td>
<td>25-12-2008</td>
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<tr>
<td></td>
<td></td>
<td>US 2008199108 A1</td>
<td>21-08-2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 2007002292 A2</td>
<td>04-01-2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ZA 200711065 A</td>
<td>25-03-2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 5937617 A</td>
<td>17-08-1999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 6076664 A</td>
<td>20-06-2000</td>
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Form PCT/ISA/210 (patent family annex) (April 2008)