Abstract:

A foldable laminated sheet (20) comprises at least one inner polymer layer (23), at least one inner layer (21, 24) of sized paper, and a respective outer polymer layer (25) on each side of the sheet (20).
— with amended claims

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
MOISTURE RESISTANT FOLDABLE MATERIAL AND CONTAINER
ERECTED FROM BLANK FABRICATED THEREFROM

Technical Field

The present invention relates generally to foldable sheets and to containers which are erected from blanks which are fabricated from foldable sheets. In particular, the present invention relates to moisture-resistant foldable sheets and containers which are erected from blanks which are fabricated from moisture-resistant foldable sheets. These containers can be used, by way of example, for storing fruit and vegetable products in high humidity environments, in environments where water is splashed around or showered on the containers, or where the containers are left to sit on damp floors or in puddles, or for applications where the container and its contents may be immersed in water.

Background Art

Trays of the type which are erected from a blank which is fabricated from a sheet of foldable paperboard material are sometimes exposed to moisture. If the paperboard material is not sufficiently "sized" or otherwise waterproofed, the material will tend to absorb moisture. This is undesirable, as the moisture may be absorbed to such an extent that it deteriorates the material and reduces the strength of the tray. Also, the absorption of the moisture may induce fungal spoilage of the tray or the contents of the tray.

Laminated foldable sheets which are less prone to absorbing moisture have been developed to overcome this problem. Such laminated sheets typically include a paperboard substrate and a layer of waterproof material such as polyethylene or polyethylene terephthalate (PET) laminated on at least one surface of the substrate. Although the layer of waterproof material is able to inhibit the substrate from absorbing moisture to a certain degree, moisture is still able to penetrate, via wicking, the substrate through the edges thereof which are not covered by the waterproof material.

Disclosure of the Invention

It is an object of the present invention to overcome, or at least ameliorate, one or more of the deficiencies of the prior art mentioned above, or to provide the
consumer with a useful or commercial choice.

Other objects and advantages of the present invention will become apparent from the following description, taken in connection with the accompanying illustrations, wherein, by way of illustration and example, a preferred embodiment of the present invention is disclosed.

According to a first broad aspect of the present invention there is provided a foldable laminated sheet comprising at least one inner polymer layer, at least one inner layer of sized paper, and a respective outer polymer layer on each side of the sheet.

The inner and outer polymer layers are able to inhibit the absorption of moisture through the surfaces of each layer of sized paper. Also, the presence of the at least one inner polymer layer increases the rigidity of the sheet.

Preferably, the foldable laminated sheet includes at least one inner layer of sized paper on each side of each inner polymer layer.

Each inner polymer layer may be a layer of polyethylene, polypropylene or PET. In a particular preferred form, each inner polymer layer is a layer of low density polyethylene (LDPE), or a layer of medium density polyethylene (MDPE) which is a blend of LDPE and high density polyethylene (HDPE).

Each inner layer of sized paper is preferably a layer of kraft paper. For example, each inner layer of sized paper may be a layer of 270 grams per square metre (gsm) kraft paper, 165 gsm kraft paper, or hard sized 440 gsm recycled paper which is a 100% recycled paper.

Each inner layer of sized paper is preferably hard sized to limit the amount of moisture which it is able to absorb through the edges of the cut sheet. Preferably, each inner layer of sized paper is hard sized to a water absorptiveness level which is low enough to resist wicking of water into each layer of sized paper and which is high enough so as not to resist bonding with an adhesive such as, for example, polyvinyl acetate (PVA). In a preferred form, each layer of sized paper is hard sized to a water absorptiveness level of 80 to 100 gsm per 30 minutes as measured by the Australian Standards AS1301 Cobb Test for water absorptiveness. In a particular preferred form, each layer of sized paper is hard sized to a water absorptiveness level of 90 gsm per 30 minutes as measured by the Cobb Test for water absorptiveness.
Each outer polymer layer may be a layer of polyethylene, polypropylene or PET. In a particular preferred form, each outer polymer layer is a layer of low density polyethylene (LDPE). Each outer polymer layer is preferably corona discharge treated.

A particular preferred embodiment of the foldable laminated sheet comprises a pair of inner polymer layers, a respective first inner layer of sized paper laminated on each inner polymer layer, wherein the first inner layers of sized paper are adhered to each other, a respective second inner layer of sized paper laminated on each inner polymer layer, and a respective outer polymer layer laminated on each second inner layer of sized paper.

The inner polymer layers are preferably layers of MDPE.

The first inner layers and the second inner layers of sized paper are preferably layers of kraft paper. In a particular preferred form, the first inner layers and the second inner layers of sized paper are layers of 270 gsm kraft paper. The first inner layers of sized paper are preferably adhered to each other with PVA glue.

The outer polymer layers are preferably layers of LDPE.

Another particular preferred embodiment of the foldable laminated sheet comprises an inner polymer layer, a respective first inner layer of sized paper laminated on each side of the inner polymer layer, a respective second inner layer of sized paper adhered to each first inner layer of sized paper, and a respective outer polymer layer laminated on each second inner layer of sized paper.

The inner polymer layer is preferably a layer of MDPE.

The first inner layers of sized paper may be layers of kraft paper or layers of recycled paper. In one particular preferred form, the first inner layers of sized paper are layers of 270 gsm kraft paper. In another particular preferred form, the first inner layers of sized paper are layers of 440 gsm recycled paper. Also, the first inner layers of sized paper are preferably adhered to the second inner layers of sized paper with PVA glue.

The second inner layers of sized paper may be layers of kraft paper or layers of recycled paper. In one particular preferred form, the second inner layers of sized paper are layers of 270 gsm kraft paper. In another particular preferred form, the
second inner layers of sized paper are layers of 165 gsm kraft paper.

The outer polymer layers are preferably layers of LDPE.

The foldable laminated sheet is preferably used to make containers adapted to hold fruit, vegetables, meat, fish or other produce.

According to a second broad aspect of the present invention there is provided a method of producing a foldable laminated sheet, the method comprising the steps of:

(i) laminating at least one inner layer of sized paper on at least one inner polymer layer; and

(ii) laminating a respective outer polymer layer on each side of the sheet.

Preferably, the step of laminating at least one inner layer of sized paper on at least one inner polymer layer involves laminating at least one inner layer of sized paper on each side of each inner polymer layer.

The method preferably includes the step of corona discharge treating the outer polymer layers of the laminated sheet.

Preferably, at least some of the layers of the laminated sheet are laminated together by a corrugating/laminating machine using an adhesive.

According to a third broad aspect of the present invention there is provided a container which is erected from a blank which is fabricated from a foldable laminated sheet comprising at least one inner polymer layer, at least one inner layer of sized paper, and a respective outer polymer layer on each side of the sheet.

Preferably, there is at least one inner layer of sized paper on each side of each inner polymer layer.

The container may be any suitable type of container. Preferably, the container is a tray. In a particular preferred form, the tray is a stackable tray.

The container is preferably adapted to hold fruit, vegetables, meat, fish or other produce.

**Brief Description of the Drawings**

In order that the invention may be more fully understood and put into practice, a preferred embodiment thereof will now be described with reference to the accompanying illustrations, in which:
Figure 1 depicts the layers of a foldable laminated sheet according to a first preferred embodiment of the present invention;

Figure 2 depicts the layers of a foldable laminated sheet according to a second preferred embodiment of the present invention;

Figure 3 depicts the layers of a foldable laminated sheet according to a third preferred embodiment of the present invention;

Figure 4 depicts a blank which is able to be erected into a tray and which is fabricated from any one of the laminated sheets illustrated in figures 1 to 3;

Figure 5 depicts a tray which is erected from the blank illustrated in figure 4;

Figure 6 depicts another blank which is able to be erected into a tray and which is fabricated from any one of the laminated sheets illustrated in figures 1 to 3; and

Figure 7 depicts a tray which is erected from the blank illustrated in figure 6.

**Modes for Carrying Out the Invention**

Referring to figure 1, a foldable laminated sheet 20 includes two inner layers 21 of 270 gsm kraft paper that are adhered to each other with polyvinyl acetate (PVA) adhesive 22. A respective inner layer 23 of medium density polyethylene (MDPE) is laminated on each of the layers 21, and a respective inner layer 24 of 270 gsm kraft paper is laminated on each of the layers 23. A respective outer layer 25 of low density polyethylene (LDPE) is laminated on each of the layers 24.

Referring to figure 2, a foldable laminated sheet 30 includes an inner layer 31 of MDPE. A respective inner layer 32 of 270 gsm kraft paper is laminated on each side of the layer 31. Each layer 32 has a respective inner layer 33 of 270 gsm kraft paper adhered thereto with PVA adhesive 34. A respective outer layer 35 of LDPE is laminated on each of the layers 33.

With reference to figure 3, a foldable laminated sheet 40 includes an inner layer 41 of MDPE and a respective inner layer 42 of hard sized 440 gsm 100% recycled paper (i.e. T40 paper) laminated on each side of the layer 41. The code "T40" signifies a particular type of paper developed by the applicant. A respective inner layer 43 of 165 gsm kraft paper is adhered to each layer 42 with PVA adhesive 44. A
respective outer layer 45 of LDPE is laminated on each layer 43.

Each paper layer 21, 24, 32, 33, 42, 43 is hard sized to a specific water absorptiveness level which is low enough to resist wicking of water into the paper, and which is high enough so as not to resist bonding of the PVA adhesive 22, 34, 44. It has been found that an absorptiveness level of approximately 90 gsm/30 minutes as measured by the Cobb Test meets these requirements.

The LDPE layers 25, 35, 45 are applied in-line on to the paper layers 24, 33, 43 and are then corona discharge treated to facilitate hot melt bonding and elementary printing thereon. The LDPE layers 25, 35, 45 may be clear or they may be coloured. For example, if coloured, the LDPE layers 25, 35, 45 may be black or white.

The medium density polyethylene which forms the MDPE layers 23, 31, 41 is a blend of low density polyethylene and high-density polyethylene polymers. The MDPE layers 23, 31, and 41 respectively function as tie layers between the paper layers 21 and 24, 32, and 42 of the sheets 20, 30, and 40, and as secondary moisture barriers. Also, the presence of the MDPE layers 23, 31, 41 increases the stiffness and compressive strength of the sheets 20, 30, 40.

Before the paper layers 21, 32, 33, 42, 43 of the sheets 20, 30, 40 are adhered to each other with the PVA adhesive 22, 34, 44, the various paper and polymer layers of the sheets 20, 30, 40 that are not adhered together with the PVA adhesive 22, 34, 44 are laminated together. The paper layers 21, 32, 33, 42, 43 of the sheets 20, 30, 40 are then laminated and adhered using a conventional corrugating machine. PVA adhesive is used for adhering the paper layers 21, 32, 33, 42, 43 of the sheets 20, 30, 40 together as it is moisture resistant.

Sheets 20, 30, 40 are sufficiently water resistant that they are able to withstand being submerged for a short period of time as measured by the Cobb and Board Wicking Tests without any adverse affects. Moreover, the sheets 20, 30, 40 have a high compressive strength as measured by the Australian Standards AS1301 Edgewise Compression Test.

The corona discharge treatment of the LDPE layers 25, 35, 45 of the sheets 20, 30, 40 allows printing or an adhesive to key to the LDPE layers 25, 35, 45. In addition, the corona discharge treatment facilitates the erection of containers from
blanks which are fabricated from the sheets 20, 30, 40.

The LDPE layers 25, 35, 45 of the sheets 20, 30, 40 also provide a surface which is approved by the FDA for contact with food.

The rigidity of the sheets 20, 30, 40 limits the amount by which the sides of containers which are fabricated from the sheets 20, 30, 40 are able to bulge. If the containers are trays, this can reduce the occurrence of telescope failure of the trays which can occur when a load which rests on top of the sides of a tray causes the sides of the tray to bulge to such an extent that the load slips into the tray.

Figure 4 depicts a blank 50 which may be fabricated from any one of the laminated sheets 20, 30, 40 and which is able to be erected into a stackable tray.

Blank 50 includes a generally rectangular bottom wall panel 51 which includes a plurality of circular ventilation openings 52.

A pair of opposing outer side wall panels 53 is hinged to the bottom wall panel 51 along double fold lines 54. The outer side wall panels 53 are generally rectangular-shaped. Each outer side wall panel 53 has a respective series of cuts 55 located adjacent to each end thereof. The cuts extend into the outer LDPE layers on the exterior faces of the outer side wall panels 53.

A respective pair of corner stacking tab-receiving openings 56 is located between the bottom wall panel 51 and each of the outer side wall panels 53.

A respective rectangular inner side wall panel 57 is hinged to each of the outer side wall panels 53 along a double fold line 58.

A pair of opposing end wall panels 59 is hinged to the bottom wall panel 51 along double fold lines 60. The end wall panels 59 are rectangular-shaped, and each end wall panel 59 includes a pair of elongate ventilation openings 61.

A respective pair of opposing first corner post panels 62 is hinged to each of the end wall panels 59 along double fold lines 63.

A respective second corner post panel 64 is hinged to each of the first corner post panels 62 along a double fold line 65.

A respective corner stacking tab-receiving recess 66 extends into each pair of hinged first and second corner post panels 62, 64 from a lower edge thereof. Also a respective corner stacking tab 67 extends from each pair of hinged first and second
corner post panels 62, 64 from an upper edge thereof.

A respective securing flap 68 is hinged to each of the second corner post panels 64 along a double fold line 69. A respective H-shaped cut 70 forms a discontinuity in each of the fold lines 69.

A respective closure flap 71 is hinged to each end wall panel 59 along a double fold line 72. Each closure flap 71 has a curved recess 73 in a free edge 74 thereof.

A respective pair of opposing securing flaps 75 is hinged to each of the closure flaps 71 along double fold lines 76.

A respective corner stacking tab-receiving recess 77 is located between each of the securing flaps 75 and the closure flap 71 to which the securing flap 75 is hinged.

Figure 5 depicts a tray 80 which has been erected from the blank 50 and which may be used to hold fruit, vegetables, meat, fish or other produce.

Tray 80 is erected by folding the first corner post panels 62 relative to the end wall panels 59 along the fold lines 63 so that the first corner post panels 62 are perpendicularly upstanding from the interior faces of the end wall panels 59. The second corner post panels 64 are then folded relative to the first corner post panels 62 along the fold lines 65, and the securing flaps 68 are folded relative to the second corner post panels 64 along the fold lines 69 so that the securing flaps 68 overlie the interior faces of the end wall panels 59 and so that the second corner post panels 64 extend between the first corner post panels 62 and the end wall panels 59. The securing flaps 68 are adhered to the end wall panels 59.

The inner side wall panels 57 are then folded relative to the outer side wall panels 53 along the fold lines 58 so that the inner side wall panels 57 overlie the interior faces of the outer side wall panels 53. The inner side wall panels 57 are adhered to the outer side wall panels 53. The outer side wall panels 53 are then folded relative to the bottom wall panel 51 along the fold lines 54 so that the outer side wall panels 53 are upstanding from the bottom wall panel 51.

The closure flaps 71 are then folded relative to the end wall panels 59 along the fold lines 72 so that the closure flaps 71 extend towards each other and so that
each corner stacking tab 67 extends through a respective corner stacking tab-receiving recess 77. Next, the securing flaps 75 are folded relative to the closure flaps 71 along the fold lines 76 so that the securing flaps 75 overlie the exterior faces of the outer side wall panels 53 and, in particular, overlie the cuts 55. The securing flaps 75 are then adhered to the outer side wall panels 53. The cuts 55 assist in bonding the adhesive to the exterior faces of the outer side wall panels 53 which are coated with a layer of LDPE.

Figure 6 depicts a blank 90 which may be fabricated from any one of the laminated sheets 20, 30, 40 and which is able to be erected into a stackable tray.

For convenience, features of the blank 90 which are the same as or which are similar to features of the blank 50 are referenced using the same reference numbers.

Unlike the blank 50, blank 90 does not include corner stacking tab-receiving openings 56 located between the bottom wall panel 51 and each of the outer side wall panels 53. Instead, the blank 90 has a respective pair of stacking tab-receiving openings 91 located between the bottom wall panel 51 and each of the end wall panels 59.

Blank 90 also differs from the blank 50 in that each of the end wall panels 59 of the blank 90 include a pair of stacking tabs 92 extending therefrom. Also, the first and second corner post panels 62, 64 of the blank 90 do not include a corner stacking tab-receiving recess 66 or a corner stacking tab 67. Moreover, a respective stacking tab 93 extends from an upper edge of each of the securing flaps 68, and a respective stacking tab-receiving recess 94 extends into each of the securing flaps 68 from a lower edge thereof.

A respective pair of stacking tab-receiving openings 95 is located between each of the end wall panels 59 and closure flaps 71 of the blank 90. Also, the blank 90 does not include corner stacking tab-receiving recesses 77.

Figure 7 depicts a tray 100 which has been erected from the blank 90 and which may be used to hold fruit, vegetables, meat, fish or other produce.

Tray 100 is erected by folding the first corner post panels 62 relative to the end wall panels 59 along the fold lines 63 so that the first corner post panels 62 are perpendicularly upstanding from the interior faces of the end wall panels 59. The
second corner post panels 64 are then folded relative to the first corner post panels 62 along the fold line 65, and the securing flaps 68 are folded relative to the second corner post panels 64 along the fold lines 69 so that the securing flaps 68 overlie the interior faces of the end wall panels 59 and so that the second corner post panels 64 extend between the first corner post panels 62 and the end wall panels 59. Each stacking tab 93 overlies a respective stacking tab 92. The securing flaps 68 are adhered to the end wall panels 59.

The inner side wall panels 57 are then folded relative to the outer side wall panels 53 along the fold lines 58 so that the inner side wall panels 57 overlie the interior faces of the outer side wall panels 53. The inner side wall panels 57 are adhered to the outer side wall panels 53. The outer side wall panels 53 are then folded relative to the bottom wall panel 51 along the fold lines 54 so that the outer side wall panels 53 are upstanding from the bottom wall panel 51.

The closure flaps 71 are then folded relative to the end wall panels 59 along fold lines 72 so that the closure flaps 71 extend towards each other and so that each pair of overlying stacking tabs 92, 93 extends through a respective stacking tab-receiving opening 95. Next, the securing flaps 75 are folded relative to the closure flaps 71 along the fold lines 76 so that the securing flaps 75 overlie the exterior faces of the outer side wall panels 53 and, in particular, overlie the cuts 55. The securing flaps 75 are then adhered to the outer side wall panels 53. The cuts 55 assist in bonding the adhesive to the exterior faces of the outer side wall panels 53 which are coated with a layer of LDPE.

The blanks 50, 90 are fabricated from the sheets 20, 30, 40 using a rotary die-cutter machine which includes means for forming the various double fold lines of the blanks 50, 90.

Throughout the specification and the claims, unless the context requires otherwise, the term "comprise", or variations such as "comprises" or "comprising", will be understood to apply the inclusion of the stated integer or group of integers but not the exclusion of any other integer or group of integers.

Throughout the specification and claims, unless the context requires otherwise, the term "substantially" or "about" will be understood to not be limited to
the value for the range qualified by the terms.

It will be appreciated by those skilled in the art that variations and modifications to the invention described herein will be apparent without departing from the spirit and scope thereof. The variations and modifications as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of the invention as herein set forth.

It will be clearly understood that, if a prior art publication is referred to herein, that reference does not constitute an admission that the publication forms part of the common general knowledge in the art in Australia or in any other country.
CLAMS:

I. A foldable laminated sheet comprising at least one inner polymer layer, at least one inner layer of sized paper, and a respective outer polymer layer on each side of the sheet.

2. The foldable laminated sheet of claim 1, wherein there is at least one inner layer of sized paper on each side of each inner polymer layer.

3. The foldable laminated sheet of claim 1, wherein each inner polymer layer is a layer of polyethylene, polypropylene or polyethylene terephthalate.

4. The foldable laminated sheet of claim 3, wherein each inner polymer layer is a layer of low density polyethylene or medium density polyethylene.

5. The foldable laminated sheet of claim 1, wherein each inner layer of sized paper is a layer of kraft paper or a layer of recycled paper.

6. The foldable laminated sheet of claim 5, wherein each inner layer of sized paper is a layer of 270 gsm kraft paper, 165 gsm kraft paper, or hard sized 440 gsm recycled paper.

7. The foldable laminated sheet of claim 1, wherein each inner layer of sized paper is hard sized to a water absorptiveness level which is low enough to resist wicking of water into each layer of sized paper and which is high enough so as not to resist bonding with an adhesive.

8. The foldable laminated sheet of claim 7, wherein each inner layer of sized paper is hard sized to a water absorptiveness level of 80 to 100 gsm per 30 minutes.

9. The foldable laminated sheet of claim 8, wherein each inner layer of sized paper is hard sized to a water absorptiveness level of 90 gsm per 30 minutes.

10. The foldable laminated sheet of claim 1, wherein each outer polymer layer is a layer of polyethylene, polypropylene or polyethylene terephthalate.

II. The foldable laminated sheet of claim 10, wherein each outer polymer layer is a layer of low density polyethylene.

12. The foldable laminated sheet of claim 1, wherein each outer polymer layer is corona discharge treated.

13. The foldable laminated sheet of claim 1, wherein the sheet comprises a pair of inner polymer layers, a respective first inner layer of sized paper laminated on each
inner polymer layer, wherein the first inner layers of sized paper are adhered to each other, a respective second inner layer of sized paper laminated on each inner polymer layer, and a respective outer polymer layer laminated on each second inner layer of sized paper.

14. The foldable laminated sheet of claim 13, wherein the first inner layers of sized paper are adhered to each other with PVA glue.

15. The foldable laminated sheet of claim 1, wherein the sheet comprises an inner polymer layer, a respective first inner layer of sized paper laminated on each side of the inner polymer layer, a respective second inner layer of sized paper adhered to each first inner layer of sized paper, and a respective outer polymer layer laminated on each second inner layer of sized paper.

16. The foldable laminated sheet of claim 15, wherein the first inner layers of sized paper are adhered to the second inner layers of sized paper with PVA glue.

17. The foldable laminated sheet of claim 1, where the sheet is used to make containers adapted to hold fruit, vegetables, meat, fish or other produce.

18. A method of producing a foldable laminated sheet, the method comprising the steps of:
   (i) laminating at least one inner layer of sized paper on at least one inner polymer layer; and
   (ii) laminating a respective outer polymer layer on each side of the sheet.

19. The method of claim 18, wherein the step of laminating at least one inner layer of sized paper on at least one inner polymer layer involves laminating at least one inner layer of sized paper on each side of each inner polymer layer.

20. The method of claim 18, wherein the method includes the further step of corona discharge treating the outer polymer layers.

21. The method of claim 18, wherein at least some of the layers of the laminated sheet are laminated together by a corrugating/laminating machine using an adhesive.

22. A container which is erected from a blank which is fabricated from a foldable laminated sheet comprising at least one inner polymer layer, at least one inner layer of sized paper, and a respective outer polymer layer on each side of the sheet.

23. The container of claim 22, wherein there is at least one inner layer of sized
paper on each side of each inner polymer layer.

24. The container of claim 22, wherein the container is a tray.

25. The container of claim 24, wherein the tray is a stackable tray.

26. The container of claim 22 wherein the container is adapted to hold fruit, vegetables, meat, fish or other produce.
AMENDED CLAIMS
received by the International Bureau on 19 January 2007.

1. A foldable laminated sheet comprising at least one inner polymer layer, at least three inner layers of sized paper, and a respective outer polymer layer on each side of the sheet.

2. The foldable laminated sheet of claim 1 wherein there are four inner layers of sized paper.

3. The foldable laminated sheet of claim 1 wherein there is at least one inner layer of sized paper on each side of each inner polymer layer.

4. The foldable laminated sheet of claim 1 wherein each inner polymer layer is a layer of polyethylene, polypropylene or polyethylene terephthalate.

5. The foldable laminated sheet of claim 4 wherein each inner polymer layer is a layer of low density polyethylene or medium density polyethylene.

6. The foldable laminated sheet of claim 1 wherein each inner layer of sized paper is a layer of kraft paper or a layer of recycled paper.

7. The foldable laminated sheet of claim 6 wherein each inner layer of sized paper is a layer of 270 gsm kraft paper, 165 gsm kraft paper, or hard sized 240 gsm recycled paper.

8. The foldable laminated sheet of claim 1 wherein each inner layer of sized paper is hard sized to a water absorptiveness level which is low enough to resist wicking of water into each layer of sized paper and which is high enough so as not to resist bonding with an adhesive.

9. The foldable laminated sheet of claim 8 wherein each inner layer of sized paper is hard sized to a water absorptiveness level of 80 to 100 gsm per 30 minutes.

10. The foldable laminated sheet of claim 9 wherein each inner layer of sized paper is hard sized to a water absorptiveness level of 90 gsm per 30 minutes.

11. The foldable laminated sheet of claim 1 wherein each outer polymer layer is a layer of polyethylene, polypropylene or polyethylene terephthalate.

12. The foldable laminated sheet of claim 11 wherein each outer polymer layer is a layer of low density polyethylene.

13. The foldable laminated sheet of claim 1 wherein each outer polymer layer is corona discharge treated.

14. The foldable laminated sheet of claim 1 wherein the sheet comprises a pair of inner polymer layers, a respective first inner layer of sized paper laminated on each side thereof.
inner polymer layer, wherein the first inner layers of sized paper are adhered to each other, a respective second inner layer of sized paper laminated on each inner polymer layer, and a respective outer polymer layer laminated on each second inner layer of sized paper.

15. The foldable laminated sheet of claim 14, wherein the first inner layers of sized paper are adhered to each other with PVA glue.

16. The foldable laminated sheet of claim 1, wherein the sheet comprises an inner polymer layer, a respective first inner layer of sized paper laminated on each side of the inner polymer layer, a respective second inner layer of sized paper adhered to each first inner layer of sized paper, and a respective outer polymer layer laminated on each second inner layer of sized paper.

17. The foldable laminated sheet of claim 16, wherein the first inner layers of sized paper are adhered to the second inner layers of sized paper with PVA glue.

18. The foldable laminated sheet of claim 1, wherein the sheet is used to make containers adapted to hold fruit, vegetables, meat, fish or other produce.

19. A method of producing a foldable laminated sheet, the method comprising the steps of:

(i) laminating together at least three inner layers of sized paper and at least one inner polymer layer; and

(ii) laminating a respective outer polymer layer on each side of the sheet.

20. The method of claim 19, wherein the step of laminating together at least three inner layers of sized paper comprises laminating together four inner layers of sized paper and at least one inner polymer layer.

21. The method of claim 19, wherein the step of laminating together the at least three inner layers of sized paper and the at least one inner polymer layer includes the step of laminating a respective one of the least three inner layers of sized paper on each side of each inner polymer layer.

22. The method of claim 19, wherein the method includes the step of corona discharge treating the outer polymer layers.

23. The method of claim 19, wherein at least some of the layers of the laminated sheet are laminated together by a corrugating/laminating machine using an adhesive.

24. A container which is erected from a blank which is fabricated from a foldable laminated sheet comprising at least one inner polymer layer, at least three

AMENDED SHEET (ARTICLE 19)
inner layers of sized paper, and a respective outer polymer layer on each side of the sheet.

25. The container of claim 24, wherein there are four inner layers of sized paper.

26. The container of claim 24, wherein there is at least one inner layer of sized paper on each side of each inner polymer layer.

27. The container of claim 24, wherein the container is a tray.

28. The container of claim 27, wherein the tray is a stackable tray.

29. The container of claim 24 where the container is adapted to hold fruit, vegetables, meat, fish or other produce,

30. The container of claim 24, wherein the container is adapted such that a liquid is able to drain out of the container.

31. The container of claim 24, wherein the container is adapted to substantially maintain its structural integrity when wet.
FIGURE 6
INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2006/001395

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

B32B 29/00 (2006.01)  B32B 27/10 (2006.01)  B65D 5/00 (2006.01)

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)

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

DWPI: B32B 29/00 or 27/10 and keywords ((fold+ or creas+ or bend+) and (water resist* or waterproof* or water barrier)) or B65D 5/00 and keywords ((poly+ or lam+) and paper+)

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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<td>X</td>
<td>WO 2001/01961 1 A (NIHON TETRA PAK KK) 22 March 2001 Whole document</td>
<td>1-26</td>
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<tr>
<td>X</td>
<td>US 4701360 A (GIBBONS, CHARLES ET AL) 20 October 1987 Whole document</td>
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<td>X</td>
<td>EP 237235 B (INTERNATIONAL PAPER COMPANY) 16 September 1987 Whole document</td>
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Date of the actual completion of the international search:
06 November 2006

Date of mailing of the international search report:
15 KVM

Name and mailing address of the ISA/AU

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## DOCUMENTS CONSIDERED TO BE RELEVANT

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<tr>
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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>US 2005/0048232 A (COCOZZA, DAVID D) 3 March 2005 Whole document</td>
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