(12) UK Patent Application (19) GB (11) 2472257 (13) A

(43) Date of A Publication 02.02.2011

(21) Application No: 0913353.9

(22) Date of Filing: 31.07.2009

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(51) INT CL:
B65D 5/00 (2006.01) ***B65D 5/44*** (2006.01)
B65D 21/02 (2006.01)

(56) Documents Cited:
GB 1029492 A **WO 2000/076860 A1**
WO 1997/037895 A1 **DE 009013421 U**
FR 002739356 A1 **JP 110059662 A**
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(58) Field of Search:
INT CL **B65D**
Other: **EPODOC, WPI**

(54) Title of the Invention: **Carton**
Abstract Title: **Carton with reinforcing struts for stacking**

(57) A carton 10 comprising a base. portion 12; a first side. portion 18a extending from a first edge region of the base portion; a second side portion 18b extending from a second edge region of the base portion; a third side portion 20a extending from a third edge region of the base portion; and a fourth side portion 20b extending from a fourth edge region of the base portion; the first and second edge regions being opposite to and extending substantially parallel to one another, and the third and fourth edge regions being opposite to and extending substantially parallel to one another, wherein the carton further comprises first and second support portions 22a, arranged adjacent the first and second side portions respectively, which extend respectively from the first and second edge regions away from the base portion. Also provided is a blank for such a carton.

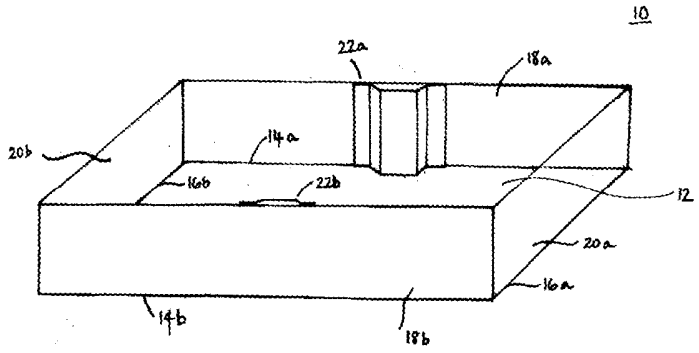


Figure 1a

GB 2472257 A

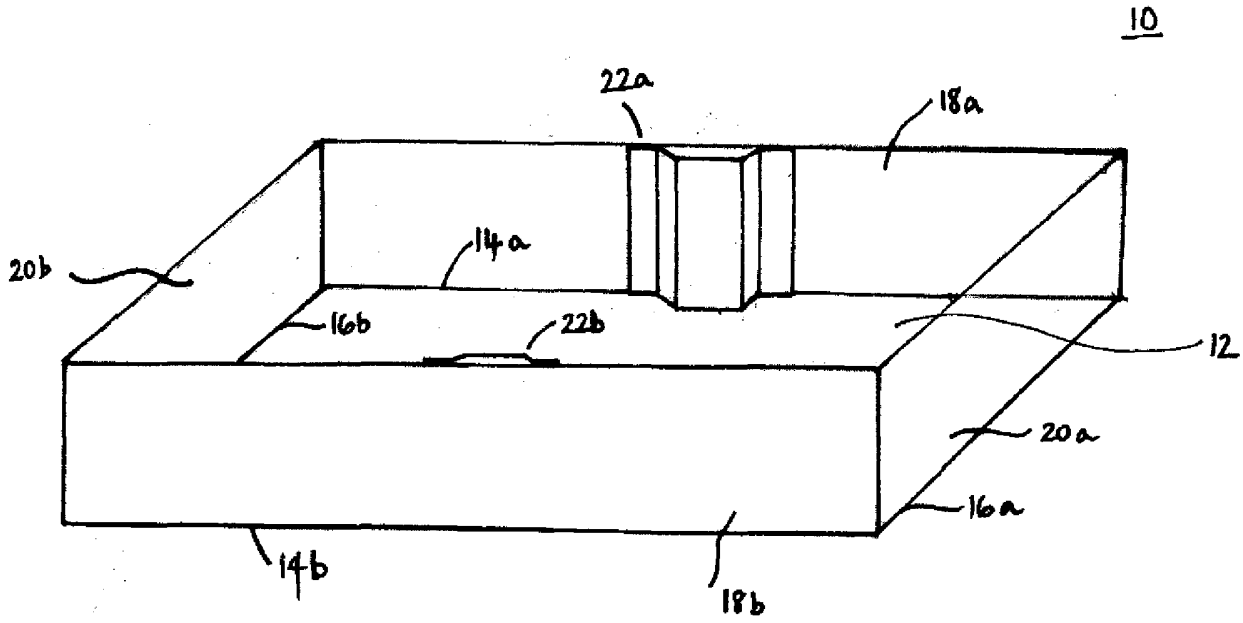

10
22a
18a
20b
14a
16b
22b
12
20a
16a
14b
18b

Figure 1a

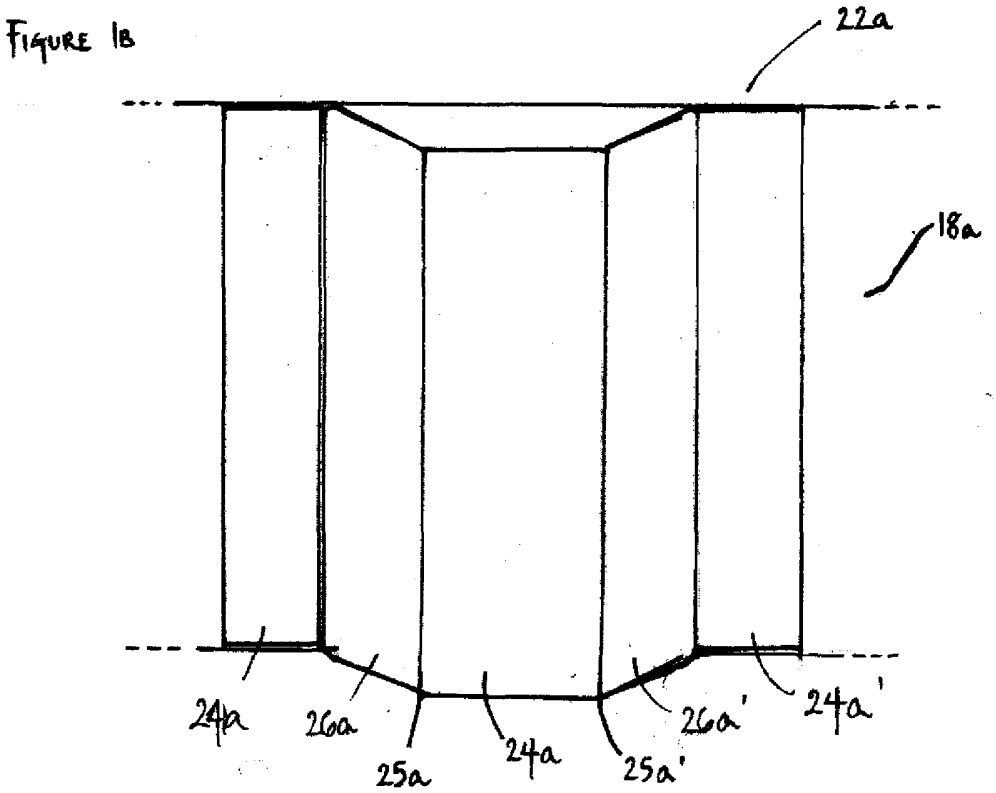


FIGURE 1B
22a
18a
24a
26a
25a
24a
25a'
26a'
24a'

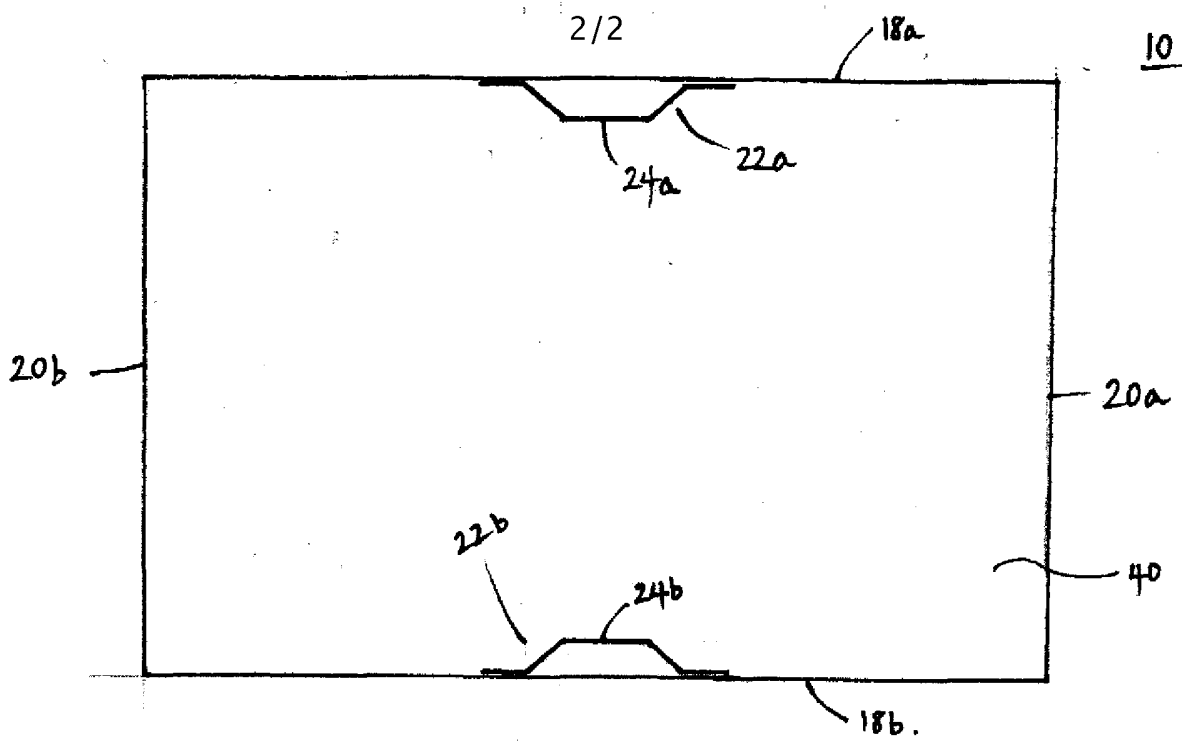
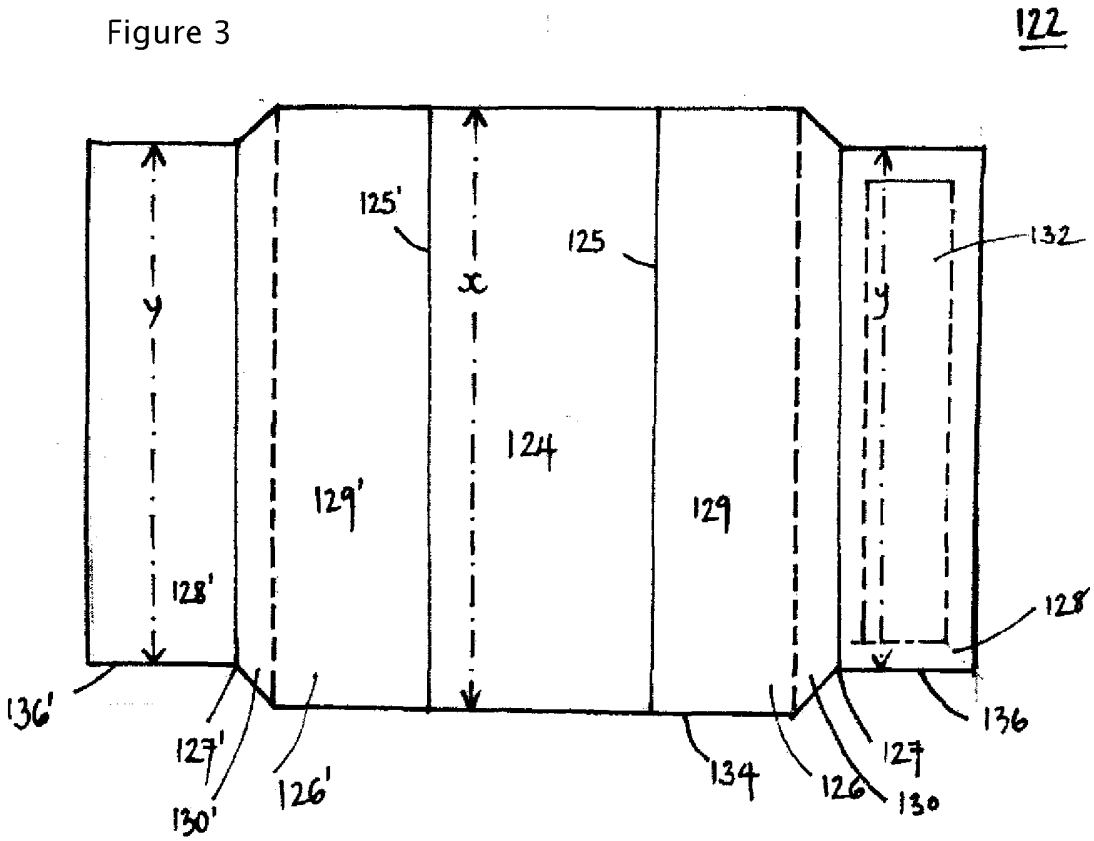


figure 2

Figure 3



CARTON

Background to the invention

The present invention relates to a blank for forming a packaging carton provided with reinforcing strut and to a packaging carton provided with a reinforcing strut formed from the blank.

The invention is particularly, but not exclusively, applicable to a blank intended to be supplied to a user who then with the aid of machinery assembles a carton from the blank.

Conventional cartons are typically formed by folding a blank along pre-formed fold lines and, where appropriate, employing an adhesive or other fixing means to secure adjacent panels together thus holding the final carton in the correct, closed configuration.

Once configured, cartons are typically filled with material or goods for transportation. During transportation the cartons are typically stacked, either directly on top of one another or in alternating orientation.

However, when cartons are stacked, particularly in alternating orientation, the side walls of conventional cartons can be pushed apart by the weight of the carton or cartons sitting on top of them. This causes the carton, and in turn carton contents, to be squashed. The squashing of the carton weakens the carton structure making unloading of the stacked cartons more problematic, as well as rendering the cartons of no further use. This waste of cartons is costly both in monetary and environmental terms. Additionally, the carton contents may be damaged resulting in further cost and wastage.

There is therefore a need for a carton with strengthened side walls such that the structure and shape of the carton is maintained even when additional cartons are stacked on top of each other.

Summary of the Invention

An object of the present invention is to obviate or mitigate at least one of the aforementioned problems.

According to the first aspect of the present invention there is provided a carton comprising:

a base portion;

a first side portion extending from a first edge region of the base portion;

a second side portion extending from a second edge region of the base portion;

a third side portion extending from a third edge region of the base portion; and

a fourth side portion extending from a fourth edge region of the base portion;

the first and second edge regions being opposite to and extending substantially parallel to one another, and the third and fourth edge regions being opposite to and extending substantially parallel to one another,

wherein the carton further comprises first and second support portions, arranged adjacent the first and second side portions respectively, which extend respectively from the first and second edge regions away from the base portion.

Preferably, the support portion comprises a base contact portion which contacts the base portion and extends away therefrom in a direction substantially parallel to the first and second side portions and has a height x, and a side portion contact region which extends adjacent the respective first or second side portion in a direction parallel to the base contact portion and has a height y, the height x being greater than the height y.

Further preferably, the side portion contact region contacts the respective first or second side portion along the full length of height y.

The side portion contact region preferably makes no direct contact with the base portion.

The first and second support portions may extend from the base portion at a position substantially equidistant from the third and fourth edge regions.

Preferably, the first and second support portions are positioned so as to support respective edge regions of further cartons stacked on upper edges of the side portions.

The base is preferably substantially planar. The first, second, third and fourth side portions may preferably be substantially planar. However, it will be appreciated that the base and/or any of the first, second, third and fourth side portions may be of any desired contour and may optionally include integral projects to act as feet for the base and/or grooves, ripples, dimples, ridges or any other desired contours on which the contents received within the carton may rest during containment. Alternatively, or in addition, the base may include contours which correspond to the contours of the mater\ial to be contained within the carton such that the contained material is held in position within the container.

Preferably the base portion is substantially rectangular.

According to a second aspect of the invention there is provided a blank for a carton, the blank being of stiff, bendable material, the blank comprising a base portion, a first side portion extending from a first edge region of the base portion, a second side portion extending from a second edge region of the base portion, a third side portion extending from a third edge region of the base portion, and a fourth side portion extending from a fourth edge region of the base portion, wherein the first and second edge regions are opposite one another, and wherein the third and fourth edge regions are opposite one another, and wherein the blank further comprises first and second support portions which, when the carton is in use, extend from the first and second edge regions away from the base portion, adjacent the first and second side portions respectively.

Preferably the support portion of the blank further comprises a base contact portion which, when the carton is in use, contacts the base portion and extends away therefrom in a direction substantially parallel to the first and second side portions and

has a height x, and a side contact region which extends adjacent the respective first or second side portion in a direction parallel to the base contact portion and has a height y, the height x being greater than the height y.

A further aspect of the present invention provides a carton formed from a carton blank in accordance with a second aspect of the present invention.

Brief Description of the Drawings

These and further aspects of the present invention will become apparent from the following description when taken in combination with the accompanying drawings in which:

Figure 1A is a perspective view of a carton according to a preferred embodiment of the invention;

Figure 1B is a detail of the perspective view of Figure 1A;

Figure 2 is a cross section of a plan view the carton of Figure 1A;

Figure 3 is a plan view of a blank for a strut according to a second embodiment of the invention.

Detailed Description of the Invention

With reference to Figure 1A, a carton 10 is shown assembled ready for use. The carton 10 comprises a flat rectangular base 12 having opposing edges 14a and 14b and opposing edges 16a and 16b wherein edges 14a and 14b are longer than edges 16a and 16b. A first pair of opposing rectangular side panels 18a and 18b extend from edges 14a and 14b respectively and a second pair of opposing rectangular side panels 20a and 20b extend from edges 16a and 16b respectively.

Side panels 18a and 18b are each provided with a strut 22a and 22b respectively which acts to provide reinforcement to the structure of the carton 10.

A section of side panel 18a provided with strut 22a is shown in Figure 1B. As can be seen, strut 22a has a planar wall 24a formed centrally which is arranged parallel to but apart from side panel 18a. The strut 22a is further provided with supporting walls 26a and 26a' which extend at an angle from elongate edges 25a and 25a' respectively of wall 24a. Supporting walls 26a and 26a' connect to attaching walls 28a and 28a' respectively which are parallel to and abutting against side panel 18a to which they are secured. The strut 22a is arranged such that the void 30a formed between side panel 18a supporting walls 26a and 26a' and wall 24a is trapezoidal in cross section.

In Figure 2 is shown a cross section plan of the carton 10. As can be seen, struts 22a and 22b are arranged in an interior 40 defined by side panels 18a, 18b, 20a and 20b and are positioned such that walls 24a and 24b are opposite to and parallel to each other. Struts 22a and 22b are arranged halfway along walls 18a and 18b respectively.

In use, the carton 10 is manufactured on a production line and the assembled carton is created and secured together using adhesive automatically. The strut will be assembled and secured by adhesive to the side panel of the carton during this production line manufacture.

By providing carton 10 with strut 22, additional strength is created in the carton structure. This means that once the cartons are filled, either without or with a lid (not shown) and stacked, particularly in alternating orientations, the sides of the cartons will better support the weight without distorting in shape and becoming squashed.

A plan view of a strut 122, according to a second embodiment of the invention is shown in Figure 3. As can be seen the strut 122 has a base contact edge 134 from which the wall 124 extends to a height x meaning elongate edges 125a and 125a' each have a height x. The strut is also provided with side contact edges 136 and 136' from which attaching walls 128 and 128' extend from to a height y meaning elongate edges 127 and 127´each have a height y. Supporting walls 126 and 126' comprise areas 129 and 129' respectively which extend from base contact edge 134 to a height of x. Supporting walls 126 and 126' also comprise areas 130 and 130' which are arranged between 129, 129' and elongate edges 127, 127' respectively. In areas 130, 130' the

height reduces from x where 130, 130' join 129, 129' to y where 130, 130' adjoin 127,127' respectively.

In the embodiment shown in Figure 3, the reduction in height from x to y results in areas 130, 130' having a trapezoidal shape.

This shape of strut blank means that when assembled and in use, particularly if the carton and strut are formed of strong material, the strut is not fouled by the assembled carton when it is folded. This means the strut is not compromised in function or form, and similarly, no damage is caused to the carton.

During assembly of the carton and strut, the strut is folded along edges 125, 125', 127 and 127'; adhesive is then applied to area 132 on attaching wall 128 and similarly on 128' (not illustrated). The strut is applied to the appropriate side panel in the desired position to provide a void having a trapezoidal cross section and the strut is secured in place by the adhesive. The carton is then folded and secured together, using securing means such as adhesive.

Various modifications may be made to the embodiments hereinbefore described without departing from the scope of the invention. For example, the carton may be provided with our without a lid. Furthermore the lid may have a bonding agent located such as to be secured in place on the carton as desired. The carton may be formed having overhang panels extending from each side panel such that a lip, or overhang is created around the opening to the carton, this will created further strength in the carton structure as well as reducing the likelihood of cartons from the content falling out of the carton during transit. Drainage holes may be provided in the carton base or side panels, particularly if the materials being carried contain fluid that may require to drain. The cross section of the void 30 formed by the strut 22 has been described as trapezoidal; however, it will be clear that alternative cross section shapes would work equally well. For example, the strut 22 could be formed without the wall 24a such that supporting walls 26a and 26a' were connected directly to each other, this would give the strut a triangular cross section. Alternatively the wall 24 could be shaped into a curve giving the strut a semi-circular cross section. Furthermore, the carton base has been described as rectangular but it should be understood that it could

be square, or hexagonal. It may be necessary for other base shapes to include additional struts in the carton to add further strength. Additionally, a carton having a rectangular may have more than one strut per side panel if further strength is required in a given side panel. It will also be understood that whilst the assembly of the carton and strut have been described as using adhesive as securing means, and suitable securing means could be used, including for example staples.

CLAIMS

1. A carton comprising:
   a base portion;
   a first side portion extending from a first edge region of the base portion;
   a second side portion extending from a second edge region of the base portion;
   a third side portion extending from a third edge region of the base portion; and
   a fourth side portion extending from a fourth edge region of the base portion;
   the first and second edge regions being opposite to and extending substantially parallel to one another, and the third and fourth edge regions being opposite to and extending substantially parallel to one another,
   wherein the carton further comprises first and second support portions, arranged adjacent the first and second side portions respectively, which extend respectively from the first and second edge regions away from the base portion.

2. A carton as claimed in claim 1, wherein the support portion comprises a base contact portion which contacts the base portion and extends away therefrom in a direction substantially parallel to the first and second side portions and has a height x, and a side portion contact region which extends adjacent the respective first or second side portion in a direction parallel to the base contact portion and has a height y, the height x being greater than the height y.

3. A carton as claimed in claim 1 or claim 2, wherein the side portion contact region contacts the respective first or second side portion along the full length of height y.

4. A carton as claimed in any preceding claim, wherein the side portion contact region makes no direct contact with the base portion.

5. A carton as claimed in any preceding claim, wherein the first and second support portions extend from the base portion at a position substantially equidistant from the third and fourth edge regions.

6. A carton as claimed in any preceding claim, wherein the first and second support portions are positioned so as to support respective edge regions of further cartons stacked on upper edges of the side portions.

7. A carton as claimed in any preceding claim, wherein the base is substantially planar.

8. A carton as claimed in any preceding claim, wherein the first, second, third and fourth side portions are be substantially planar.

9. A carton according to any preceding claim, wherein the base portion is substantially rectangular.

10. A blank for a carton, the blank being of stiff, bendable material, the blank comprising a base portion, a first side portion extending from a first edge region of the base portion, a second side portion extending from a second edge region of the base portion, a third side portion extending from a third edge region of the base portion, and a fourth side portion extending from a fourth edge region of the base portion, wherein the first and second edge regions are opposite one another, and wherein the third and fourth edge regions are opposite one another, and wherein the blank further comprises first and second support portions which, when the carton is in use, extend from the first and second edge regions away from the base portion, adjacent the first and second side portions respectively.

11. A blank as claimed in claim 10, wherein the support portion of the blank further comprises a base contact portion which, when the carton is in use, contacts the base portion and extends away therefrom in a direction substantially parallel to the first and second side portions and has a height x, and a side contact region which extends adjacent the respective first or second side portion in a direction parallel to the base contact portion and has a height y, the height x being greater than the height y.

12. A carton formed from a carton blank as claimed in claim 10 or claim 11.

Application No:	GB0913353.9	**Examiner:**	Mr Darren Williams
Claims searched:	1-12	**Date of search:**	17 May 2010

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-12	JP11059662 A (KOYAKUMARU) see figures and English abstract provided
X	1-12	FR2739356 A1 (SUDROT) see figures and English abstract provided
X	1-12	DE9013421 U (ABEL) see figures (no abstract available)
X	1-12	GB1029492 A (JENK) see whole document
X	1-12	US5535942 A (VILONA) see whole document
X	1-12	WO00/76860 A1 (SHEFFER) see whole document
X	1-12	WO97/37895 A1 (HALSELL) see whole document
X	1-12	US4341338 A (ARNOLD) see whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^{X} :

Worldwide search of patent documents classified in the following areas of the IPC

B65D

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI

International Classification:

Subclass	Subgroup	Valid From
B65D	0005/00	01/01/2006
B65D	0005/44	01/01/2006
B65D	0021/02	01/01/2006