Abstract Title: A bag or container and a blank for forming a bag or container

A blank (10) which can be folded into a bag or container and subsequently unfolded comprising:
- a polygonal base (11),
- walls (13,15) extending from each edge (12,14) of the base (11), the walls substantially touching one another at vertices of the base (11),
- fold portions (17) in the form of gusset folds between the edges (18) of adjacent walls (13,15), the fold portions (17) extending along substantially the whole length of the edges (18) of the adjacent walls (13,15),
- the fold portions (17) each having at least one fold line (22) extending from the respective vertex (16) of the base (11).

A bag or container can be formed by folding the walls (13,15) upwards, so that walls extending from the same vertex (16) of the base (11) are positioned substantially next to one another, with the respective fold portion (17) being folded to lie against at least one of the walls (13). The walls (13) and the fold portions (17) are not permanently fixed to one another and the bag or container can therefore be unfolded.
A BAG OR CONTAINER AND A BLANK FOR FORMING A BAG OR CONTAINER

The present invention relates to a bag or container formed by folding a blank.

It is well known to form bags or containers by folding a blank formed of laminar material such as card or paper. Normally, the blank has a complex shape, which may be cruciform or some other figure with re-entrant angles between parts of the blank which form faces of the bag or container when folded.

Very many bags or containers are formed in this way by folding a blank and then adhering or fixing parts of the blank together in such a way that they form a substantially permanent box which is not intended to be dismantled.

WO02/38453 discloses a carton, bag or carrier which is formed from a laminar blank along pre-determined fold lines. The design of the blank is such that the container can be subsequently unfolded to define an open tray with slightly raised edges and a generally flat bottom. To achieve this, outer sections of the blank, defined by fold lines, are provided, the outer sections being generally smaller in dimension than the inner sections of the blank, so that they form edges of a tray of appropriate size and shape.

This design has the disadvantage that, when folded up, the parts which define the edges of the tray form sides of the container by meeting one another but these sides are not defined by a single continuous sheet, so there is a risk of articles becoming lost through them.
The present inventor has set out to provide an improved bag or container, which can be unfolded to form a substantially flat sheet and which provides a contained space with substantially complete walls when folded.

The present inventor has realised that this can be achieved by providing wall portions which are of a size to define walls of the container or bag, fold portions being formed between the wall portions and extending along the edges of the wall portions, the bag being formed by folding up the wall portions with the fold portions folded to lie adjacent a respective wall portion.

Accordingly, the present invention provides a bag or container formed by folding a blank, the blank comprising the following portions connected to one another by fold lines:

- a polygonal base portion,
- wall portions, extending from each edge of the polygonal base portion, the wall portions substantially touching one another at vertices of the base portion,
- fold portions, formed between the edges of adjacent wall portions extending from a respective vertex of the base portion, the fold portions extending along substantially the whole length of the adjacent wall portions,
- the fold portions each having at least one fold line extending from the respective vertex of the base portion,
- the bag or container being formed by folding the wall portions upwards, so that wall portions which extend from the same vertex of the base portion are positioned substantially next to one another, with the respective fold portion being folded to lie adjacent at least one of the wall portions,
- contacting wall portions and fold portions being not fixed to one another, so that the bag or container can be unfolded to define a flat sheet.

The polygonal base portion may have any suitable polygonal shape. It is most preferably a square or rectangle, though a hexagon or octagon may be used if desired.
The wall portions may be any suitable shape. Suitably, they are rectangular so that the bag or container formed may have a generally prismatic shape. Alternatively, they may be trapezoidal, so that the bag or container defines a truncated pyramid.

Preferably, each fold portion has a single fold line which substantially bisects the angle formed between adjacent wall portions. This allows the adjacent wall portions to be folded up to one another smoothly so that their edges substantially touch.

It is particularly advantageous if the fold portion are each defined on two sides by fold lines touching adjacent wall portions and on an outside edge by an edge having at least one curved section, or which is defined by a series of straight line sections each of which is shorter than the length of the edge of the adjacent wall. Preferably, the curved section is intersected by the fold of the fold portion. In this way, when the fold portion is folded, its extent along the fold is smaller than if the fold portion had been defined by lines which met at an angle touching the fold line.

Each one of or selected ones of the wall portions, base portion and fold portions may have further fold lines, for example to provide folds for folding the blank before it is assembled or for providing better conformation of the bag to an article to be carried.

However, it is preferred that the number of fold lines in the blank be kept at a low level, so that the sheet when unfolded has a pleasing appearance which does not give the impression of being crumpled.

For example, at least one wall portion may have a gusset structure formed in it so that the bag or container can be collapsed for storage when the bag does not contain any article. For example where the base portion is square or rectangular, wall portions extending from opposite edges of the base portion may each have a gusset so that the container may be folded flat.

It is an advantage of the present invention that parts which touch one another when folded up are not permanently fixed to one another, for example by staples, adhesive, or other fixings. However, releasable fixings may be provided, for example,
adjacent portions may be connected between one another in a releasable fashion by providing tabs or regions of at least one of the adjacent portions which can be folded over or into engagement with a part of the adjacent portion, for example a slot or hole.

The blank may further comprise strengthening tabs which are folded over onto an adjacent portion in use to locally increase the thickness of the wall of the bag or container, for example in the region of handles.

A handle may be formed in the bag or container by forming at least one recess in at least one portion of the blank. Preferably, corresponding recesses are formed in portions which, when the bag is assembled are brought into contact with one another so that when the recesses are held by a user, the bag is held closed.

Preferably, corresponding recesses are formed in the fold portions, positioned so that, when the fold portions are folded over to lie adjacent the respective wall portion, the respective recesses line up. This can provide a very thick and strong handle.

Alternatively, handles may be formed by additional structures which extend from the blank or are fixed onto the blank by adhesive or the like.

The blank may be formed from any suitable material, for example paper, cloth, synthetic material or card, optionally treated with material such as plastic or metal for example, metalised foil, or paper, card or cloth with a waterproof membrane, or any suitable material.

Some parts of the blank may be locally reinforced by adhered portions, for example an extra layer of card.

The bag or container according to the present invention can be used to carry a wide range of materials, depending upon the size and material of the blank. For example, suitable materials can be chosen to allow the bag to carry food.
The size of the blank depends upon the size of the article to be carried. However, by way of example only, the blank can be formed into a generally square form of side approximately 10cms-1m, more preferably 20cm-70cm.

The fold lines may be provided by any suitable means. For example, they may be defined by printed lines to allow a user to fold the lines as desired. However, preferably, the lines are pre-folded in a suitable manner. The lines may be scored or impressed to define fold lines.

The outer periphery of the blank preferably forms a substantially closed figure with few re-entrant features or projections. This provides a shape which is aesthetically pleasing and easy to use as a mat or cloth.

As all of the folded elements of the fold portion, flap portions etc. are folded onto the walls of the bag and not onto the base portion, it is possible to unfold the bag according to the present invention when it is sitting on a flat surface even if the bag is filled with articles, the bag being disassembled around the articles. This makes it very convenient to use.

It is important to note that the bag or container according to the present invention is assembled without using any permanent fixing such as staples or glue. This allows it to be assembled and disassembled at will without damaging components, making it very convenient in use. This also ensures that, when unfolded, the bag resumes a substantially flat structure.

The present invention further provides a method of forming a bag or container, by preparing a blank described in the invention and folding the blank.

The present invention further provides a blank for forming a bag or container according to the invention.

The present invention will be further described by way of example only with reference to the accompanying drawings, in which
BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a blank according a first embodiment of the present invention.
Figure 2 shows the blank of figure 1 in a partially assembled state
Figure 3 shows the blank of figure 1 assembled into a bag.
Figure 4 shows a bag of figure 3 with the handles in a holding position
Figure 5 shows a second embodiment of blank according to the invention.
Figure 6 shows the blank of figure 5 folded up to define a bag in a collapsed position for storage.
Figure 7 shows a third embodiment of the blank according to the present invention.
Figure 8 shows the blank of figure 7 in a partially assembled state.
Figure 9 shows the blank of figure 8 in a completely assembled state.
Figure 10 shows a forth embodiment of blank according to the present invention.
Figure 11 shows the blank of figure 10 assembled and closed

Figure 1 shows a blank, generally designated 10 according to a first embodiment of the invention. It comprises a plurality of portions which are connected to one another by fold lines which are shown dotted in the drawings. The fold lines may be folded up towards the viewer or down away from the viewer in a manner which will become apparent from the following drawings.

The blank 10 comprises a rectangular base portion 11. The base portion 11 has, extending from each of the long sides 12, a wall portion 13, and from each of the short sides 14, a wall portion 15. The long sides 12 and the short sides 14 meet at vertices 16. Between each wall portion 13 and the wall portions 15 on either side of it, there is a fold portion 17. The fold portion 17 extends along the whole length of the sides 18 of the adjacent wall portions. The sides 18 are of the same length in all cases. The outer edges of each fold portion 17 are defined by a line which has a first straight line section 19, a curved section at the corner 20 and a second straight line section 21. Each fold portion 19 is bisected by a fold line 22 which extends from the respective vertex 16 to the centre of the curved portion 20.
Each of the wall portions 15 adjacent the shorter sides 14 of the base portion 12 comprise gusset lines 23, 24.

A plurality of handle holes 25 are formed on each side of the fold line 22 in each fold portion 17 and in the flap portions 26. The flap portions 26 extends from the outer edge of the respective wall portion 13.

Handle structures 27 are formed in wall portions 13.

The handle holes 25 in the fold portions are all of the same design and comprise a simple cut out. The handle structures 27 in the wall portions 13 are of the same design as each other but comprise a region defined by an oblong, one side of which is not cutaway but connected to the wall portion 13 to act as a hinge, as will be described further below.

In order to create a bag or container from the blank 10, each of the wall portions 13 and 15 is folded up along the respective edge 12, 14 towards the viewer. At the same time, the fold portions 17 are first of all folded along their fold lines 22 so that the fold line 22 comes up towards the viewer and then the fold portions are drawn in, as shown in figure 2, so that they lie against the respective wall portion 13.

Subsequently, as shown on the opposite face of the container being formed in figure 2, the flap portion 26 is folded down over the wall portion 13 and folded fold portions 17 so that its handle hole 25 over lies the handle holes 25 of the fold portions 17 and the handle structure 27 of the wall portion 13. The handle structure 27 of the wall portion 13 is rotated about its connected edge and pushed through the handle holes 25 of the fold portions 17 and the flap 26. This has a number of advantages. In the first place, the wall portion, fold portions and flap portion are held together in a releasable fashion. Secondly, a smooth edge is formed which is comfortable to hold. Thirdly, the flap portions stiffen the upper edge of the handle, giving the bag strength. The flap portion itself has the effect of resisting any tendency of the bag to open itself.
Figure 3 shows the complete bag. It should be noted, at this stage, the flap has not been folded about the gusset fold lines 23, 24 of the wall portion 15. These folds are provided so that the wall portion 15 can be collapsed slightly as shown in figure 4 to bring the upper edges of the wall portions together so that the handle holes on each side of the bag line up, to provide easy carrying. It can be seen that the distance D from the point where the fold line 22 meets the rounded section 20 to the edge 18 is less than or equal to the width W of the wall portion 13 so that, when the fold portion 19 is folded onto the wall portion 13, it does not extend in the width direction any further than the width of the wall portion 13. This enables it to lie smoothly against the wall portion 13 without any additional folds and without incorporating any more stresses into the design which tend to unfold it when not required.

Figure 5 is a plan view of a second embodiment of blank according to the present invention. Most of the parts thereof are the same as figure 1 and are not numbered and not described, for simplicity.

The second embodiment of bag shown in figure 5 includes an additional gusset 28 of a design known in the art which allows the folded bag to be collapsed flat as shown in figure 6.

The bag according to the present invention may be formed without the handle holes 25, 27. The handles may be supplied, for example, by handle structures 29 which are fixed onto the wall portions 13 by gluing, stapling or by any other suitable process, as shown in the third embodiment of blank shown in figure 7. The blank of figure 7 is assembled by folding as shown in figures 8 and 9, in exactly the same way as shown in figure 2 except that there is no handle portion 27 to hold the wall portions, fold portions etc together. However, it is formed that, with most grades of material, these portions will stay in a fixed position adequately even without the handle holes.

In the fourth embodiment of bag according to the present invention, a handle structure is formed by folding over the top portion of the bag structure when assembled, as shown in figures 10 and 11.
The invention has been described above by way of example only and modification can be made within the scope of the invention. The invention also extends to any individual features described or implicit herein or shown or implicit in the drawings or any combination of any such features or any generalisation of any such features or combination.
CLAIMS:

1. A bag or container formed by folding a blank, the blank comprising the following portions connected to one another by fold lines:

   a polygonal base portion,

   wall portions, extending from each edge of the polygonal base portion, the wall portions substantially touching one another at vertices of the base portions

   fold portions, formed between the edges of adjacent wall portions extending from a respective vertex of the base portion, the fold portions extending along substantially the whole length of the adjacent wall portions,

   the fold portions each having at least one fold line extending from the respective vertex of the base portion,

   the bag or container being formed by folding the wall portions upwards, so that wall portions which extend from the same vertex of the base portion are positioned substantially next to one another, with the respective fold portion being folded to lie adjacent at least one of the wall portions,

   contacting wall portions and fold portions being not fixed to one another, so that the bag or container can be unfolded to define a flat sheet.

2. A blank for forming a bag or container, the blank comprising the following portions connected to one another by fold lines:

   a polygonal base portion,

   wall portions, extending from each edge of the polygonal base portion, the wall portions substantially touching one another at vertices of the base portions

   fold portions, formed between the edges of adjacent wall portions extending from a respective vertex of the base portion, the fold portions extending along substantially the whole length of the adjacent wall portions,

   the fold portions each having at least one fold line extending from the respective vertex of the base portion,

   the blank being foldable into a bag or container being by folding the wall portions upwards, so that wall portions which extend from the same vertex of the base portion,
portion are positioned substantially next to one another, with the respective fold portion being folded to lie adjacent at least one of the wall portions, and so that contacting wall portions and fold portions which are not fixed to one another can be unfolded to define a flat sheet.

3. A method of forming a bag or container, comprising folding a blank, the blank comprising:
   a polygonal base portion,
   wall portions, extending from each edge of the polygonal base portion, the wall portions substantially touching one another at vertices of the base portions
   fold portions, formed between the edges of adjacent wall portions extending from a respective vertex of the base portion, the fold portions extending along substantially the whole length of the adjacent wall portions,
   the fold portions each having at least one fold line extending from the respective vertex of the base portion,
   the bag or container being formed by folding the wall portions upwards, so that wall portions which extend from the same vertex of the base portion are positioned substantially next to one another, with the respective fold portion being folded to lie adjacent at least one of the wall portions,
   contacting wall portions and fold portions being not fixed to one another, so that the bag or container can be unfolded to define a flat sheet.

4. A bag or container, substantially as herein described with reference to the accompanying drawings.

5. A blank for forming a bag or container, substantially as herein described with reference to the accompanying drawings.

6. A method of forming a bag or container, substantially as herein described with reference to the accompanying drawings.
Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

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<th>Category</th>
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<tbody>
<tr>
<td>X</td>
<td>1-3</td>
<td>GB 477926 A (JOHNSON ET AL.) See page 2, line 53-97 and fig. 1-2.</td>
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<tr>
<td>X</td>
<td>1-3</td>
<td>GB 490316 A (MARKS &amp; SPENCER LTD ET AL.) See page 3, line 36-93 and fig. 1-5.</td>
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<td>GB 714265 A (JOHN WADDINGTON LTD ET AL.) See page 2, line 4-72 and fig. 1-8.</td>
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<td>WO 02/076840 A1 (INTERNATIONAL PAPER COMPANY) See page 10, line 19 - page 11, line 6 and fig. 6.</td>
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<td>US 2151472 A (HUBBARD) See page 1, left column, line 51- page 1, right column, line 24 and fig. 1 and 6.</td>
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<td>US 2004/0031842 A1 (WESTERMAN ET AL.) See abstract and fig. 2.</td>
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<tr>
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<td>DE 9011923 U1 (FABBI) See page 6, line 11 - page 7, line 11 and fig. 1-5</td>
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