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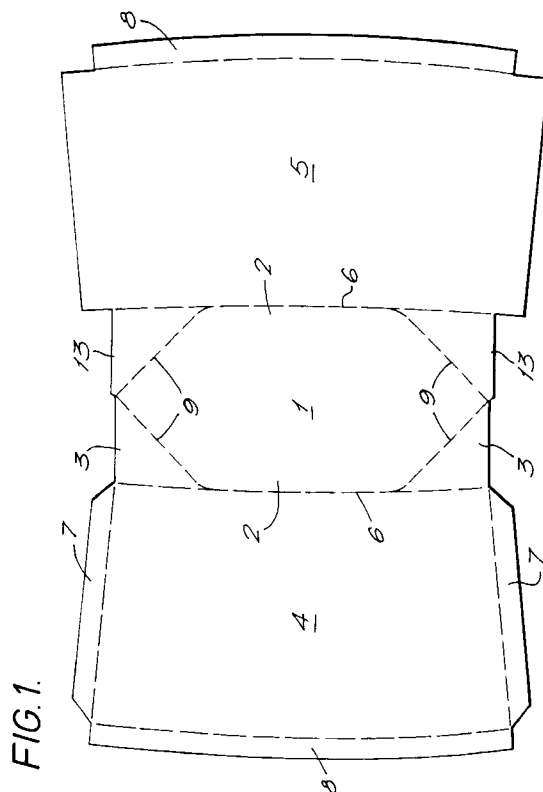
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(54) Container made from a blank of lightweight foldable sheet material

(57) A blank made of cardboard, paperboard or similar lightweight foldable sheet material, for making a container, the blank comprising a panel (1) for forming a floor of the container, and two wall panels (4,5) hingedly connected to the said floor panel for forming wall parts of the container when erected relative to the floor panel, the said floor panel being formed with suitable fold lines

(9) to enable two outward parts (12) thereof, hingedly connected to the respective wall panels as aforesaid, to be folded away between an intermediate part (10) thereof and the end regions of the wall panels, whereby, upon their said erection, the wall panels may be wrapped around the said intermediate part of the floor panel and interconnected to form adjacent wall parts of the container.



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Description

This invention relates to containers made of cardboard, paperboard or similar lightweight foldable sheet material, and especially to blanks for making the same, and has as an object to provide a container of particularly simple construction which may be used for a variety of purposes.

According to the invention there is provided a blank made of cardboard, paperboard or similar lightweight foldable sheet material, for making a container, the blank comprising a panel for forming a floor of the container, and two wall panels hingedly connected to the said floor panel for forming wall parts of the container when erected relative to the floor panel, the said floor panel being formed with suitable fold lines to enable two outward parts thereof, hingedly connected to the respective wall panels as aforesaid, to be folded away between an intermediate part thereof and the end regions of the wall panels, whereby, upon their said erection, the wall panels may be wrapped around the said intermediate part of the floor panel and interconnected to form adjacent wall parts of the container.

It is to be understood that any references herein to sides and ends of the floor panel and wall panels, and of the erected container, are only for the purposes of explanation and are not to be interpreted as meaning that the said panels and container are necessarily longer in one direction than in another. In other words the ends may be longer than the sides, or vice versa, or they may be of equal length. Indeed as will be discussed below, the invention is applicable in the manufacture of containers having a variety of shapes in plan.

Preferably, but not necessarily, in order to facilitate erection and proper shaping of the erected container, the hinge lines between the floor panel and the wall panels are formed to be slightly curved, convexly towards the wall panels.

In a convenient form of the invention the said fold lines in the floor panel comprise the respective legs of a substantially V-shaped fold line having its apex pointing outwardly and the ends of its legs meeting the hinge lines between the floor and wall panels. Such an arrangement enables the substantially triangular intermediate region thus defined in the floor panel, between the legs of the said V, to be displaced upwardly as the wall panels are wrapped around the floor panel during erection, whilst at the same time the substantially triangular regions of the floor panel outwardly of the fold lines are folded away between the floor panel and the ends of the wall panels, in gusset fashion. Of course other forms of folds may be employed in the invention, which are not necessarily V-shaped, and not necessarily symmetrical relative to the respective wall panels, and a particular shape of the fold lines may be chosen to give a desired final shape to the erected container.

The ends of the wall panels may be interconnected in any convenient fashion. Preferably they are over-

lapped. In a preferred embodiment of the invention, for providing a liquid resistant container, the inside of the blank is lined with polyethylene and this enables such ends to be heat sealed together without any additional gluing or stapling. Preferably the end of that one of the wall panels which is on the inside of the container where the wall panels are overlapped is folded back on itself in the outward direction so that a bare edge does not appear on the inside of the container, thus preventing wicking. The top edges of the wall panels may be folded over to form a double thickness rim.

It will be noted that the invention is presented, in its broad aspects, as lying in a particular arrangement of a floor panel and two wall panels of a blank. The container to be erected from such a blank may have only those two wall panels, with the specified arrangement of fold lines at both ends thereof, as in some embodiments of the invention to be described in detail below. In other embodiments, however, the blank may have one or more further wall panels, which may or may not be connected to a floor panel in the manner already described, arranged to be erected to form a container of any desired shape as seen in plan, for example square, rectangular, oval, circular, hexagonal and so on. It should thus be understood that the scope of the invention extends to a blank for making any configuration of container with the sole limitation that it includes a floor panel and two wall panels arranged as aforesaid.

Two embodiments of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a plan view of a first blank for making a container in accordance with the invention;

Figure 2 is a perspective view showing the blank partially erected;

Figure 3 is a perspective view of the erected container, seen from one end and above; and

Figure 4 is a partial plan view of a second blank for making a container, in accordance with the invention.

Referring first to Figure 1, the blank is made of cardboard coated with polyethylene on one side, which will be the inside of the erected container. The blank comprises a central floor panel 1 having two opposite sides 2 and two opposite ends 3. A pair of wall panels 4 and 5 are connected one to each of the opposite sides of the floor panel by way of hinge lines 6 which are slightly curved so as to be convex outwardly, i.e. towards the wall panels. Indeed, the wall panels themselves are of slightly trapezoidal shape, with their outer edges also convexly curved, so as to form a bucket like container with slightly outwardly divergent walls when erected. The wall panel 4 is formed with inwardly foldable tabs 7 at its opposite ends, and both of the wall panels are provided with foldable flaps 8 along their outer edges.

The floor panel 1 is formed at each of its end regions

with a V-shaped fold line 9, positioned symmetrically with regard to the central longitudinal axis of the panel. The legs of the V extend to join up with the hinge lines 6 in tangential fashion, i.e. not at a sharp angle. The fold lines 9 are reversely foldable as compared with the hinge lines 6, that is they are intended to fold upwardly rather than downwardly.

A convenient way of automatically erecting a container from the above described blank is by means of a conventional "top load" cartoning machine, which would operate by using a plunger to act on the floor panel to push the flat blank through the female part of a tool having guide portions arranged so that the side walls are folded up in the correct manner. Figure 2 shows the condition in which such a plunger (not shown), by engagement with the top surface of the floor panel 1 in the direction of arrow A, has pushed the blank part of the way into the female part of the tool so that the wall panels 4,5 have been partially folded up about the hinge lines 6. At the same time suitable parts of the tool cause the triangular central parts 10 of the end regions 11 of the floor panel, between the legs of the V-shaped folds 9, to be displaced upwardly relative to the central part of the panel, by virtue of folding of the fold lines 9. This enables the end regions 11 of the wall panels to be folded around the ends of the floor panel and overlapped with each other, the tabs 7 on the wall panel 4 first being folded outwardly through 180° to form a double thickness layer. Also the flaps 8 on the tops of the wall panels are folded down before the wall panels reach their erected positions. It will be understood that the triangular areas 12 of the floor panel, outwardly of the V-shaped fold lines 9, are folded away between the central parts 10 thereof and the adjacent parts of the walls 4 and 5, in gusset fashion.

One of such triangular areas 12 at each end of the blank, being the one on the opposite side of the blank to the wall panel 4 having the tab 7, is formed with an outward extension 13 which, upon erection, extends into the space between the outwardly folded tab 7 and the corresponding edge of the other wall panel 5, so as to keep the cut edge of the part 12 out of contact with the container contents and thus prevent wicking.

Once the container has reached the fully erected condition illustrated in Figure 3 the overlapped ends of the wall panels can be secured together by the application of heat, which can be by means of flame, by hot air, or by hot plates depending on the type of tooling employed.

Of course, the container can readily be erected by hand, if desired.

The structure of the top edge of the illustrated container is suitable to receive a board clip top or an inserted plastics plug. Alternatively the top edges could be rolled over and a board or plastics sheet or aluminium foil then heat sealed around the top of this rolled edge. A yet further possibility would be to flatten the top edges outwardly and have a sheet heat sealed or glued thereto.

Containers according to the invention, at least in the illustrated embodiment, are particularly suitable for use as freezer containers, for example for ice cream. Although such containers may not be wholly liquid tight, they can readily be made sufficiently liquid resistant to retain a liquid for the time which is needed before freezing occurs.

It will be appreciated that there are various modifications which may be made to the above described embodiment within the scope of the invention.

For example, the blank may be coated with a heat sealable material other than polyethylene as described, or, depending on the application, have no coating at all or a coating on both sides. Furthermore, the overlapped ends of the erected wall panels may be glued together rather than heat sealed together as described.

Further, the container as described above and as shown in Figure 3 is generally rectangular in plan view with curved edges. If it is desired to produce a container which is generally circular in plan, the folds 9 may be suitably modified as shown in Figure 4. In this figure, the folds 9' converge to meet half way along the hinge lines 6' defined at the sides of the floor panel 1'. The distance between the hinge lines will define the diameter of the container. Furthermore, the wall panels 4', 5' are generally rectangular in shape, rather than trapezoidal, so that the container will have parallel rather than diverging walls when erected.

If, in an alternative embodiment, a hexagonal plan container is desired, the folds 9 may be suitably redesigned and fold lines, extending away from the hinge lines 6, provided in the appropriate positions in the wall panels.

Claims

1. A blank made of cardboard, paperboard or similar lightweight foldable sheet material, for making a container, the blank comprising a panel (1) for forming a floor of the container, and two wall panels (4,5) hingedly connected to the said floor panel for forming wall parts of the container when erected relative to the floor panel, the said floor panel being formed with suitable fold lines (9) to enable two outward parts (12) thereof, hingedly connected to the respective wall panels as aforesaid, to be folded away between an intermediate part (10) thereof and the end regions of the wall panels, whereby, upon their said erection, the wall panels may be wrapped around the said intermediate part of the floor panel and interconnected to form adjacent wall parts of the container.
2. A blank as claimed in claim 1, wherein the said fold lines (9) in the floor panel (1) comprise the respective legs of a substantially V-shaped fold line having its apex pointing outwardly and the ends of its legs

meeting the hinge lines (6) between the floor panel and the wall panels (4,5).

3. A blank as claimed in claim 2, wherein the said fold lines (9) in the floor panel meet the said hinge lines (6) substantially tangentially. 5
4. A blank as claimed in any of claims 1 to 3, wherein the edges of the said wall panels (4,5) are arranged to be overlapped when interconnected, the edge (7) of the wall panel (4) on the inside of the overlap being foldable back on itself, outwardly of the erected container. 10
5. A blank as claimed in any preceding claim, wherein the said floor panel (1) is four-sided having two opposite sides (2) and two opposite ends (3), the said wall panels (4,5) being hingedly connected to the respective opposite sides of the floor panel and the said fold lines (9) being formed in both of the end regions of the floor panel. 15 20
6. A container made from a blank as claimed in any of claims 1 to 5. 25

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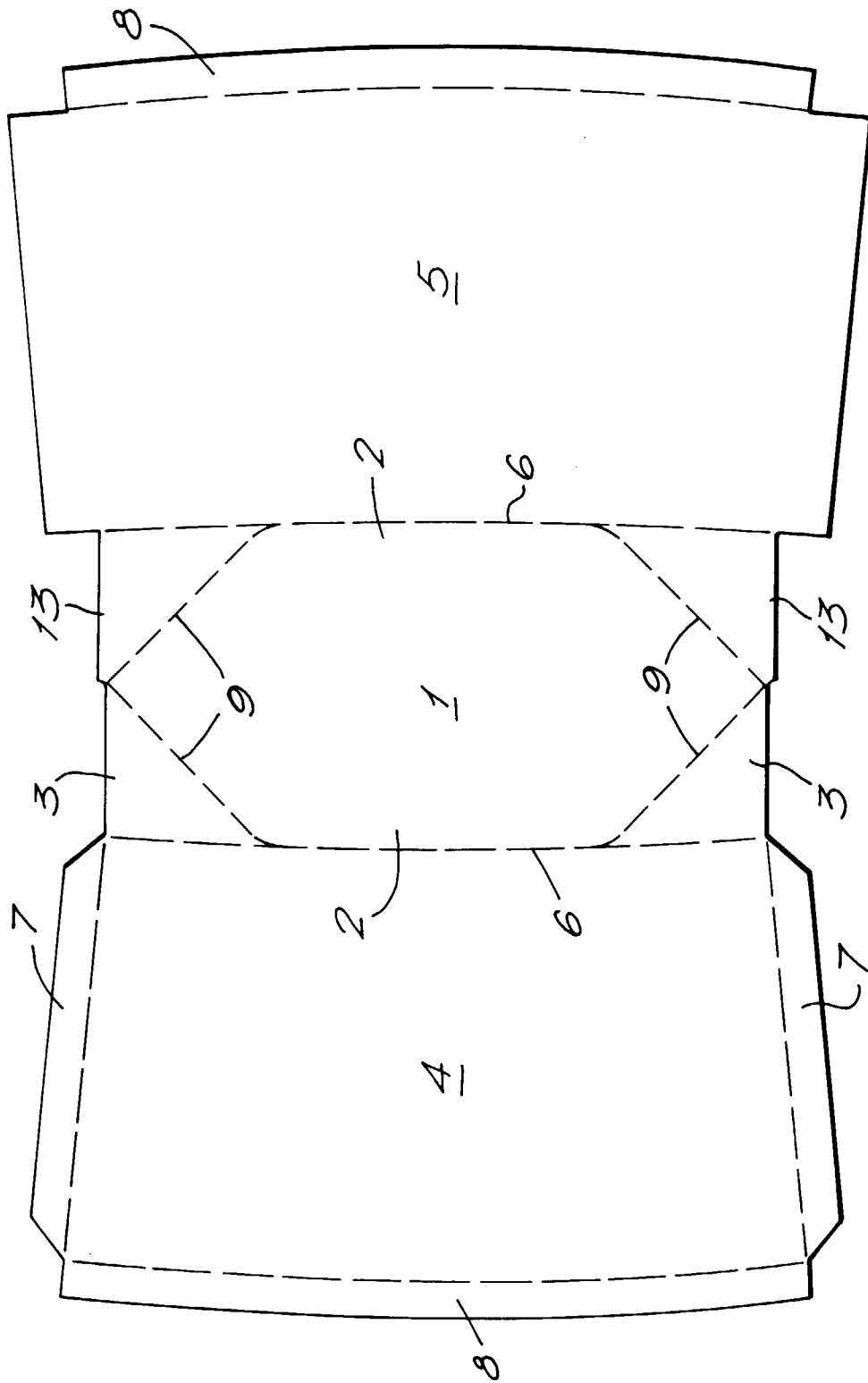


FIG. 1.

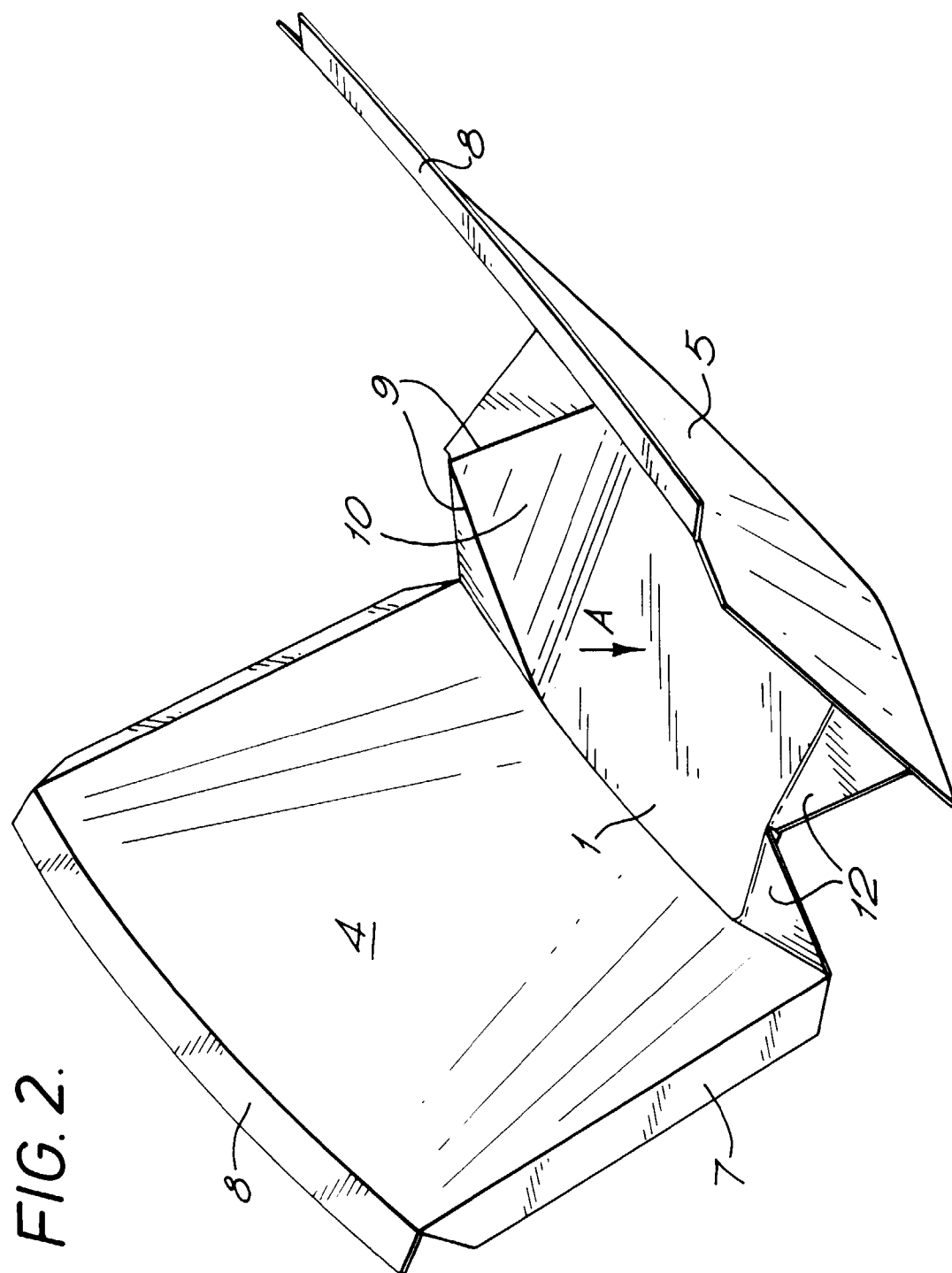


FIG. 3.

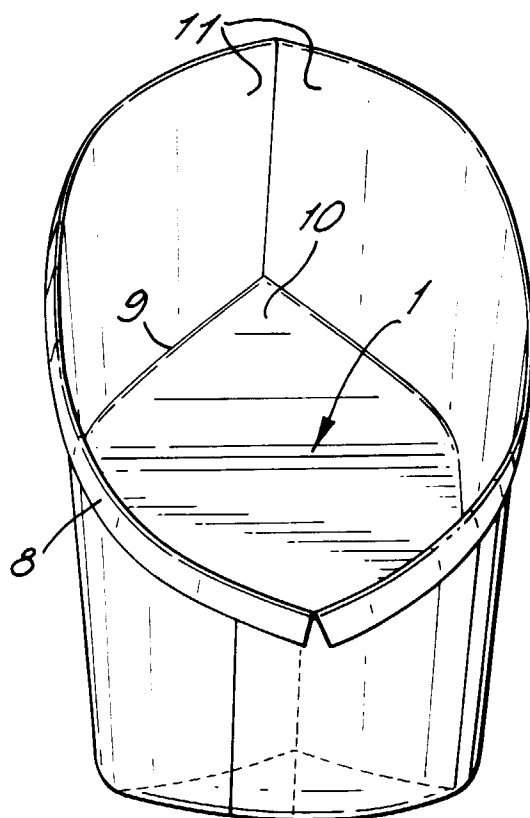


FIG. 4.

