Title: A CONTAINER COMPRISING A NUMBER OF INTERCONNECTED PANELS, A PANEL SUITABLE FOR SUCH A CONTAINER, A CONNECTING SECTION SUITABLE FOR SUCH A CONTAINER AS WELL AS A PALLET MADE OF SUCH PANELS

Abstract: A container comprising a number of interconnected panels, wherein panels are interconnected by means of a connecting section, which connecting comprises at least two legs extending parallel to each other, between which a panel can be positioned. The connecting section and the panel are made of an extruded plastic, such as polypropylene, polyethylene or a combination of the two materials.
A container comprising a number of interconnected panels, a panel suitable for such a container, a connecting section suitable for such a container as well as a pallet made of such panels.

The invention relates to a container comprising at least two frames which can be stacked on top of each other, which frames each comprise a number of elongated panels, which are pivotally interconnected via their short sides, wherein the frames can be stacked on top of each other by detachably interconnecting the longitudinal sides of the panels.

The invention also relates to a panel suitable for such a container.

The invention furthermore relates to a connecting section suitable for such a container.

The invention furthermore relates to a pallet built up of such panels, which pallet comprises a first set of spaced-apart panels extending parallel to each other as well as a second set of spaced-apart panels extending perpendicularly to said first set of panels, which first and which second set of panels are interconnected by means of blocks.

With such a container, which is known from German patent application DE-A1-196.15.613, each panel is provided with first connecting means at both short sides for effecting a hinged connection with another panel for the purpose of forming a frame. Each panel is furthermore provided with second connecting means at its longitudinal sides for effecting a connection to a longitudinal side of another panel, which makes it possible to stack two frames on top of each other. The dimensions of the container are determined by the length and width dimensions of the individual panels. If a container of a different size is required, it will be necessary to produce panels having specially adapted dimensions. However, since the panels are provided with connecting means both at their short sides and at their longitudinal sides, it will also be necessary to produce moulds having specially
adapted dimensions. Consequently, the existing container cannot easily be adapted to suit a client's specific requirements as regards the dimensions.

The object of the invention is to provide a container whose dimensions can be adapted in a simple and relatively inexpensive manner.

This object is achieved with the container according to the invention in that panels can be interconnected by means of connecting sections both via their short sides and via their longitudinal sides, which connecting sections each comprise at least one pair of legs extending parallel to each other, between which legs a panel can be positioned.

The use of a connecting section having legs that can be positioned around a panel makes it possible to simply saw, cut or form a panel to any desired length and width, after which the panels can be interconnected by means of the connecting sections and be stacked on top of each other.

A preferred embodiment of the container according to the invention is characterized in that the panel is glued in position between the legs.

Since a panel is glued in position in the connecting section, a strong connection between the panel and the connecting section is obtained.

Another embodiment of the container according to the invention is characterized in that the connecting section comprises two pairs of legs extending parallel to each other, with the legs of one pair extending in a direction away from the legs of the other pair from a bridge portion connecting the legs of a pair.

The panels can be interconnected both with their short sides and with their longitudinal sides by means of such an H-shaped connecting section.

Another embodiment of the container according to the
invention is characterized in that the legs of each pair are connected to a bridge portion extending perpendicularly to said legs, with the bridge portions of the two pairs of legs being interconnected on one longitudinal side by means of a hinge.

Since the bridge portions of the two pairs of legs are pivotally interconnected, panels of any desired length can be pivotally interconnected in a simple manner. In this way it is possible to form a collapsible container.

Yet another embodiment of the container according to the invention is characterized in that a panel is provided with a recess extending transversely to a principal plane of the panel, wherein one leg of the connecting section can be positioned in said recess, whilst another leg extends along one side of the panel.

In this way it is possible to interconnect panels with their longitudinal sides, with the panels extending transversely to each other.

Accordingly, the connecting section according to the invention is suitable for pivotally interconnecting panels at their short sides, for rigidly interconnecting panels at their longitudinal sides with the panels lying in the same plane, and for interconnecting panels at their longitudinal sides with the panels extending transversely to each other. In this way a container is obtained which is built up of a single type of connecting section and a single type of panel, wherein any desired dimension of the container can be realised in a simple manner. A further simplification can be realised by forming the connecting section integral with the panel.

The invention also relates to a pallet.

Wooden pallets are known per se, they are used for supporting various types of containers. When the known pallets are used, the container can easily shift with respect to the pallet, however. In addition, wood is frequently considered to be an unsuitable material in
connection with the risk of, for example, fungal growth and absorption of water.

With the container that is known from DE-A1-196.15.613, the pallet that is used is made of a number of beams which can be detachably connected to a floor member, with the bottom plate and the individual beams being provided with connecting elements. One drawback of such a pallet is the fact that it is not easy to produce it in any dimension that may be desired.

Consequently it is an object of the invention to provide a pallet which can readily be produced in any desired dimension.

This object is achieved with the pallet according to the invention in that the panels are made of an extruded plastic, wherein at least one set of panels is provided with recesses located near the circumference thereof, to which a connecting section comprising at least one pair of legs extending parallel to each other can be connected in use.

Since the pallet is made of plastic panels, and of blocks which are preferably made of plastic as well, the drawbacks of the wooden pallet are avoided, whilst the pallet is at the same time of simple design and can be produced in a desired dimension.

If the sides of the panels of the pallet according to the invention that face towards a container according to the invention are provided with recesses extending near the longitudinal sides, the container can be connected to the pallet in a simple manner by means of the connecting section according to the invention.

Since the connecting sections and the panels are detachably interconnected, the container can easily be disassembled for storage or for return transport to the consignor and be stored or returned in collapsed and disassembled condition.

The invention will be explained in more detail below with reference to the drawings, in which:
Figure 1 is a perspective view of a container and a pallet according to the invention;

Figure 2 is a side elevation in the direction indicated by the arrow II of the container and the pallet that are shown in Figure 1;

Figure 3 is a front view in the direction indicated by the arrow III of the container and the pallet that are shown in Figure 1;

Figure 4 is a perspective view of the pallet that is shown in Figure 1;

Figures 5A and 5B are a front view and a perspective view, respectively, of a connecting section according to the invention;

Figures 6A and 6B are a front view and a perspective view, respectively, of a panel according to the invention;

Figure 7 is a cross-sectional view of the container and the pallet in the direction indicated by the arrows VII-VII in Figure 1;

Figure 8 is a cross-sectional view of the container in the direction indicated by the arrows VIII-VIII in Figure 1;

Figure 9 is a perspective view of our part of the container that is shown in Figure 1, showing the container in partially collapsed condition; and

Figure 10 is a cross-sectional view of another embodiment of a panel according to the invention.

Like parts are indicated by the same numerals in the various Figures.

Figures 1, 2 and 3 are a perspective view, a side view and a front view, respectively, of a container 1 according to the invention, which is supported on a pallet 2 according to the invention. The container 1 is built up of panels 3 of plastic material, which are detachably interconnected by means of connecting sections 4. The pallet 2 is built up of a number of plastic panels 3' and plastic blocks 5.

The container 1 may furthermore comprise a detachable
cover 6, which closes an opening, which is bounded by the panels 3, on a side remote from the pallet 2.

As is shown in Figures 6A and 6B, each panel 3 consists of a plate extruded from a plastic material, such as polypropylene, polyethylene or a combination of such materials. The panel 3 comprises two principal planes 7 extending parallel to each other, which are interconnected by a number of ribs 8 extending perpendicularly to the principal planes 7. Present near the centre of the plate is a stiffening strip 9 extending parallel to the principal planes 7. As a result of this configuration, the panel 3 is relatively strong, whilst in addition it is relatively light on account of its cellular structure. The panel 3 is provided with a recess 11 near the two longitudinal sides 10, which recess is closed by the principal plane 7 by means of a wall portion 12. Said wall portion 12 can be removed by means of a saw or a knife, for example, thus providing access to the recess 11. The function of said recess will be explained in more detail yet with reference to Figure 7. Near its centre, the panel 3 furthermore comprises two closely spaced walls 13 extending perpendicularly to the principal planes 7, which are interconnected by two removable plate portions 14 extending perpendicularly to the walls 13, which form part of the principal planes 7. Removal of the plate portions 14 causes the panel 3 to be divided into two separate panels 3'. In this way it is possible to form a single panel 3 by means of a single extrusion section, which panels can be cut to any desired length and simply be divided into two narrow panels 3' by removing the plate portions 14.

Figure 4 is a perspective view of a pallet 2 according to the invention, which is built up of a first set of relatively narrow panels 3' extending parallel to each other. Fixed to said first set of panels 3', for example by means of screws, are blocks 5, which are made of a recyclable plastic, for example. Fixed to said blocks 5, on a side thereof remote from the first set of panels 3', is a second set of
panels 3' extending perpendicularly to said first set of panels 3'. Fixed to said second set of panels 3' are five panels 3' extending parallel to said first set of panels 3'. As a result of this relatively large number of panels 3' being used, the load exerted on the pallet 2 is evenly distributed over the pallet 2. Since the panels 3' are made of an extruded plastic, the panels can be cut or sawed to any desired length, so that it is readily possible to form a pallet 2 of any desired dimension. Since the pallet 2 is made of a plastic material, it is easy to clean, weather-resistant, relatively insensitive to moisture and wear-resistant.

The connecting section 4 as shown in Figures 5A and 5B is a section extruded from a plastic material, such as polypropylene, polyethylene or a combination of such materials, which consequently can be simply cut to any desired length. The connecting section 4 comprises two parallel bridge portions 15, 16, which are interconnected at the two longitudinal sides by means of film hinges 17, 18. The bridge portion 15 comprises a pair of legs 19, 20 extending perpendicularly to the bridge portion 15, with the leg 19 being shorter than the leg 20. The bridge portion 16 similarly comprises a pair of legs 21, 22 extending perpendicularly to the bridge portion 16, with the leg 21 being shorter than the leg 22. The shorter leg 21 is positioned on the same side as the shorter leg 19.

The construction of the container 1 and the connection to the pallet 2 will now be explained in more detail with reference to Figure 7. Figure 7 is a cross-sectional view, seen in the direction indicated by the arrows VII-VII in Figure 1, of the container 1 and the pallet 2 that are shown in Figure 1. As the Figure shows near the arrow A, two panels 3 have each been moved into a space enclosed by the respective legs 19, 20 and 21, 22 and the associated bridge portions 15 and 16, respectively, with a longitudinal side 10. The relative dimensions are preferably selected so as to make it possible to realise a
glued connection with a panel. Thus, the longitudinal sides 10 of two panels 3 extending parallel to each other are interconnected in a simple manner by means of the connecting section 4. The length of the connecting section near the connection indicated by the arrow A is slightly shorter than the length of the panels 3 interconnected by the connecting section 4, as a result of which the shorter sides 23 of the panels 3 are free near the ends of the section 4, for example for effecting the corner joint that is shown in Figure 8.

Arrow B points at a right-angled connection of two panels 3, 3', with the panels 3, 3' being interconnected at their longitudinal sides. To that end, the panel 3 is clampingly secured with a longitudinal side 10 thereof in the space bounded by the legs 21, 22 and the bridge portion 16. The wall portion 10 has been removed from the panel 3 near the longitudinal side 10 thereof, as a result of which the recess 11 is accessible. A shorter leg 19 of the connecting section 4 has been inserted into said recess 11, whilst the other leg 20 of said thereof legs extends along the longitudinal side 10 of the panel 3'. In this way a right-angled connection of two panels 3, 3' has been effected via the longitudinal sides by means of the connecting section 4. Moreover, a solid connection between the container 1 and the pallet 2 has been realised in this way.

Figure 8 is a cross-sectional view of the container 1 that is shown in Figure 1, seen in the direction indicated by the arrows VIII-VIII therein, with a right-angled connection being realised by means of a connecting section 4 via the shorter sides 23 of the panels 3. To that end, the film hinge 17 of the section 4 has been cut through by means of a knife or a saw, for example, after which the bridge portions 15, 16 have been pivoted about the film hinge 18 with respect to each other, to a position in which the bridge portions 15, 16 include an angle of 90 degrees with each other. Positioned between the legs 19, 20 and the bridge portion 15 is a short side 23 of a panel 3, whilst a short side 23
of another panel 3 is fixed between the legs 21, 22 and the bridge portion 16.

The panels 3 and the connecting sections 4 can easily be disconnected from each other when the container 1 is to be returned or stored. In order to minimise the number of operations required for doing so, it is also possible, as is shown in Figure 9, to provide two parallel longitudinal sides of the container 1 with two relatively short panels 3'' each, which panels 3'' are interconnected by means of a connecting section 4, the film hinge 17 of which has been cut through and the film hinge 18 of which is positioned on an outer side of the container. As already shown in Figure 8, the film hinge 18 is positioned near the corner on the inside of the container 1. On account of the construction that is shown in Figure 9, the panels 3, 3' form a fold-up frame, as it were, which is fully collapsible. When this construction is used, the panels 3, 3'' and the connecting sections 4 need not be disconnected from each other, but the container 1 can simply be folded down so as to minimise the amount of space it takes up during storage or transport. During said storage or transport, a container according to the invention may be used for holding a number of similar, folded-up containers according to the invention.

Figure 10 shows another embodiment of a panel 3, 3'''' comprising a connecting section 4' integrated therein. The panel 3, 3'''' has two principal planes 7' extending parallel to each other, which are interconnected by a number of ribs 8' extending perpendicularly to the principal planes 7'. Near a first end 24, the panel 3'''' comprises a connecting section 4' that is integral therewith, which connecting section comprises a leg 20 extending in line with a first principal plane 7' and a leg 19 extending in line with the other principal plane 7'. The legs 19, 20 are interconnected by a bridge portion 15' extending perpendicularly between the principal planes 7'. Near a second end 25 remote from the first end 24, the panel 3'''' comprises two wall
portions 26, 27 being staggered with respect to the principal planes 7' and extending parallel thereto. The wall portion 27 is connected to the principal planes 7' via a wall portion 28 extending in line with the principal plane 7'. Two panels 3''' can be interconnected via their longitudinal sides by inserting an end 25 of a second panel 3''' into an end 24 of a first panel 3'''.

It is also possible to leave out the stiffening strip 9, in which case a much simpler extrusion mould can be used for forming the panel.

Instead of using the film hinge 17, it is also possible to use an extended plate portion, which can be removed.

It is also possible to fit a stiffening strip between the bridge portions 15, 16, which is to be removed in order to enable hinging movement of the connecting section.

It is also possible to build up the pallet of more panels or of fewer panels.

Furthermore it is possible to connect the connecting section 4 to the pallet 2 in the manner that is shown in Figure 7, in which case the legs 21 and the bridge portion 16 are previously removed from the connecting section 4. In that case the leg 22 will function as a stop for goods that are loosely positioned on the pallet 2. Preferably, a leg 22 is connected to the leg 20 via a rigid wall portion in such a case.
CLAIMS

1. A container (1) comprising at least two frames which can be stacked on top of each other, which frames each comprise a number of elongated panels (3, 31), which are pivotally interconnected via their short sides, wherein the frames can be stacked on top of each other by detachably interconnecting the longitudinal sides of the panels (3, 31), characterized in that panels (3, 31) can be interconnected by means of connecting sections (4) both via their short sides and via their longitudinal sides, which connecting sections (4) each comprise at least one pair of legs (19, 20; 21, 22) extending parallel to each other, between which legs (19, 20; 21, 22) a panel can be positioned.

2. A container (1) according to claim 1, characterized in that the panel is glued in position between the legs (19, 20; 21, 22).

3. A container (1) according to claim 1 or 2, characterized in that the connecting section (4) is connected to a longitudinal side of a panel.

4. A container (1) according to any one of the preceding claims, characterized in that the connecting section (4) comprises two pairs of legs (19, 20; 21, 22) extending parallel to each other, with the legs (19, 20; 21, 22) of one pair extending in a direction away from the legs (19, 20; 21, 22) of the other pair from a bridge portion (15, 16) interconnecting the legs of a pair.

5. A container (1) according to claim 4, characterized in that the legs (19, 20; 21, 22) of each pair are connected to a bridge portion (15, 16) extending perpendicularly to said legs (19, 20; 21, 22), with the bridge portions (15, 16) of the two pairs of legs (19, 20; 21, 22) being interconnected on one longitudinal side by means of a hinge (17, 18).

6. A container (1) according to claim 5, characterized in that said hinge (17, 18) is a film hinge.
7. A container (1) according to claim 5 or 6, characterized in that said bridge portions (15, 16) are interconnected by a divisible wall portion (17, 18) on a side remote from said hinge (17, 18).

8. A container (1) according to any one of the preceding claims, characterized in that two panels (3, 31) are each positioned between two legs (19, 20; 21, 22) of said connecting section (4) with a short side thereof, with said panels (3, 31) being pivotally interconnected.

9. A container (1) according to any one of the preceding claims, characterized in that two panels (3, 31) are each positioned between two legs (19, 20; 21, 22) of said connecting section (4) with a longitudinal side thereof, wherein said panels (3, 31) are rigidly interconnected.

10. A container (1) according to any one of the preceding claims, characterized in that a panel is provided with a recess extending transversely to a principal plane of the panel, wherein one leg of the connecting section (4) can be positioned in said recess, whilst another leg extends along one side of the panel.

11. A container (1) according to any one of the preceding claims, characterized in that one leg (20, 22) of said pair of legs (19, 20; 21, 22) is longer than the other leg (19, 21).

12. A container (1) according to claims 10 and 11, characterized in that said shorter leg is positioned in said recess.

13. A panel suitable for a container (1) according to any one of the preceding claims.

14. A panel according to claim 13, characterized in that said panel is provided with a recess located near a longitudinal side.

15. A panel according to claim 14, characterized in that said recess is closed by a removable plate portion.

16. A panel according to any one of the preceding claims, characterized in that said panel is provided with at least one chamber
located near the centre of the panel, which chamber is bounded at least by two walls extending perpendicularly to the principal plane of the panel and two removable plate portions extending perpendicularly to the wall.

17. A panel according to any one of the preceding claims 13-16, characterized in that said panel is made of extruded polypropylene, polyethylene or a combination of the two materials.

18. A connecting section (4) suitable for a container (1) according to any one of the preceding claims 1-12.

19. A connecting section (4) according to claim 18, characterized in that said connecting section (4) comprises a bridge portion (15, 16) and a pair of parallel legs (19, 20; 21, 22) extending perpendicularly to said bridge portion (15, 16).

20. A connecting section (4) according to claim 18 or 19, characterized in that the connecting section (4) comprises two pairs of legs (19, 20; 21, 22) extending parallel to each other, with the legs (19, 20; 21, 22) of one pair extending in a direction away from the legs (19, 20; 21, 22) of the other pair from a bridge portion (15, 16) interconnecting the legs of a pair.

21. A connecting section (4) according to claim 20, characterized in that the legs (19, 20; 21, 22) of each pair are connected to a bridge portion (15, 16) extending perpendicularly to said legs (19, 20; 21, 22), with the bridge portions (15, 16) of the two pairs of legs (19, 20; 21, 22) being interconnected on one longitudinal side by means of a hinge (17, 18).

22. A connecting section (4) according to claim 21, characterized in that said hinge (17, 18) is a film hinge.

23. A connecting section (4) according to claim 21 or 22, characterized in that said bridge portions (15, 16) are interconnected by a divisible portion on a side remote from said hinge (17, 18).

24. A connecting section (4) according to any one of the
preceding claims 17-22, characterized in that said connecting section (4) is made of extruded polypropylene, polyethylene or a combination of the two materials.

25. A pallet (2) comprising a first set of spaced-apart panels (3, 31) extending parallel to each other as well as a second set of spaced-apart panels (3, 31) extending perpendicularly to said first set of panels, which first and which second set of panels are interconnected by means of blocks (5), characterized in that said panels (3, 31) are made of an extruded plastic, wherein at least one set of panels (3, 31) is provided with recesses (11) located near the circumference thereof, to which a connecting section (4) comprising at least one pair of legs (19, 20; 21, 22) extending parallel to each other can be connected in use.
FIG. 8