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(54) **Stackable container system**

Stapelbares Behältersystem

Système de conteneurs empilables

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## Description

**[0001]** The present invention relates to a container system as described in the preamble of claim 1. Such a container system is known from WO 981 56668, for example.

**[0002]** Containers made from different materials such as wood, metal, plastic etc. are frequently used. One problem with such containers is that they often demand the same transport volume when returned to the source as when delivered with goods.

**[0003]** An alternative to the return transport is a so-called one way package which is disposed of after delivery.

**[0004]** Another common way to solve the problem is to provide the package with a so-called nesting function. This means that empty containers are partly placed in one another, by providing the containers with sloping sides.

**[0005]** Yet another way to solve the problem is to dismantle or fold the sides of the container. The mostly known side dismantling is the pallet and pallet collar. An example of commonly used containers with foldable sides is the collapsible pallet container. The sides are here made foldable by attaching their respective lower end to the bottom part via a hinge.

**[0006]** A disadvantage with this type of container is that the load carrying ability is radically impaired when compared to solid, non-collapsible containers. This is mainly due to the fact that the corner parts, on non-collapsible containers taking up around 80% of the weight from above, are parted on collapsible containers. Since these load carrying corners are parted on collapsible containers, this will have to be compensated for by adding reinforcing ribs on the sides. This will, besides added weight, also cause difficulties when cleaning the container due to the number of small pockets that are formed between the ribs. Such a container is, for example, known from US 4, 674, 647.

**[0007]** One way to solve the above mentioned drawbacks has been shown in WO 97/39954 where the side walls are provided with a hollow reinforcing profile along three sides of the container. This allows a design with smooth side walls where the normal multitude of reinforcing ribs may be omitted without jeopardising the mechanical stability of the container.

**[0008]** There is however a need to make a folded container even lower than the ones known today. This can be obtained by making the reinforcing side wall profiles thinner. Some of the desired mechanical stability would however be lost.

**[0009]** A container system according to the present invention comprises the features of claim 1.

**[0010]** The stacking ledge does make it possible for a container according to the invention to be stacked together with other types of containers such as nestable containers. The flap members are hereby suitably provided with protrusions or recesses intended for the guid-

ing of the base surface of the containers to be stacked on top of the container according to the invention.

**[0011]** Preferred embodiments of the container system are described in the dependent claims.

**[0012]** According to one embodiment of the invention the flap members are provided with ends, at which ends flap locking means are arranged. The flap locking means are intended to engage edge locking means arranged at the edge of an adjacent side wall whereby adjacent side walls may be securely fixated to each other.

**[0013]** The hinges of the flap member are preferably in the form of loop-shaped snap assembly hinges. The hinges are evenly distributed over the entire length of the side wall it is attached to, whereby the number of hinges on each flap member is at least three. The flap member will hereby act as a reinforcing means and will add the mechanical strength in the side wall.

**[0014]** According to one embodiment of the invention the hinges of the flap member are in the form of loop-shaped snap assembly hinges. The hinges are evenly distributed over the entire length of the side wall it is attached to. The distance between each hinge does not exceed 75 % of the length of the upper edge of the side wall.

**[0015]** According to another embodiment of the invention the hinges of the flap members are in the form of loop-shaped snap assembly hinges, which hinges have a length exceeding 50% of the length of the upper edge of the side wall.

**[0016]** The upper edge of the side wall, on which a flap member is to be assembled, is provided with a pivot axle intended to interact with the hinges of the flap member.

**[0017]** The flap member is preferably stowed on the outside of the collapsible container when not in use, whereby the storage space on the inside of the container becomes easier to access during emptying and filling of the container.

**[0018]** According to the invention, the collapsible container is adapted to receive deviating containers of a design having a smaller base area than the collapsible container. Such deviating containers may for example be so-called stack nest containers which are nestable by being provided with sloping sides which will give the container a so-called footprint which is much smaller than the area at the upper rim of the same container. This will cause a problem since the load transferred from such a container will be applied at some distance from the load carrying corners of the collapsible container according to the present invention when a nestable container is placed on top of this. The container according to the present invention is provided with V-shaped load collectors

connected to the upper edge. The V-shaped load collectors are arranged at positions corresponding to the corners of the footprint of the deviating container. The upper edge is constituted by a hollow profile achieved through injection moulding which suitably stretches

along the two short sides and the upper edge of the side walls. Some of the pivot axes of the hinge are suitably placed so that the V-shaped load collector is used as a bypass for the hollow profile. The lower edge of the V-shaped load collector is preferably connected to a vertical profile which transfers the load to the lower side of the container.

**[0019]** The invention is explained further together with enclosed drawings showing one embodiment of the invention whereby,

- figure 1 shows, in perspective view seen from above, a collapsible container 1 which is not part of the invention.
- figure 2 shows, in perspective view seen from the inside, a corner section of the collapsible container 1 shown in figure 1.
- figure 3 shows, in perspective view seen from the inside, a corner section of the same container 1 shown in figure 1 and 2. Some parts of the container have been removed in order to facilitate the understanding of the invention.
- figure 4 shows, schematically seen from one long side, an embodiment of a collapsible container 1 according to the invention where the container 1 is adapted to receive deviating containers 1'.

**[0020]** Figures 1 - 3 show a collapsible container 1 provided with a base 2 (fig. 1) and four side walls 3 (fig. 1). The side walls 3 are separated into two long side walls 31 and two short side walls 32. The short side walls 32 and long side walls 31 are attached to the base 2 via hinge members 5 (fig. 1) at the lower end of each side wall 3. Each side wall 3 is provided with an upper edge 10. The long side walls and short side walls 31 and 32 respectively are provided with outer edges 23 and 24 respectively which outer edges 23 and 24 respectively are provided with coupling members 6 (fig. 2 and 3) intended for guiding and locking adjacent side walls 3 to each other in an erected position. The long side walls 31 are provided with flap members 7 at the upper edge 10 of the two opposing long side walls 31. The flap members 7 are moveably attached to the upper edge 10 via hinges 71 and are pivotable between an outwards position and an inwards position in which inwards position the flap members 7 act as a reinforcing means for the side wall and a stacking ledge for containers stacked on top of the collapsible container 1. The flap members 7 are provided with ends 72 (fig. 2 and 3) at which ends 72 flap locking means 73 (fig. 3) are arranged. The flap locking means 73 are intended to engage edge locking means 8 (fig. 3) arranged at the edge 10 of an adjacent side wall 3 whereby adjacent side walls 3 are securely fixated to each other when the flap members 7 are in the inner position.

**[0021]** The hinges 71 of the flap member 7 are in the form of loop-shaped snap assembly hinges, which hinges 71 are evenly distributed over the entire length of the side wall 31 it is attached to. The number of hinges 71 on each flap member 7 is four.

**[0022]** The upper edge 10 of the side wall 31, on which a flap member 7 is assembled is provided with a pivot axle 11 (fig. 3) intended to interact with the hinges 71 of the flap member 7.

**[0023]** The flap member 7 is storable on the outside of the collapsible container 1 when not in use, whereby the storage space on the inside of the container becomes easier to access during emptying and filling of the container.

**[0024]** Figure 4 shows, schematically seen from one long side, an embodiment of a collapsible container 1 according to the invention where the container 1 is adapted to receive deviating containers 1'. The collapsible container 1 provided with a base 2 (fig. 1) and four side walls 3 (fig. 1). The side walls 3 are separated into two long side walls 31 and two short side walls 32 (fig. 1) which are attached to the base 2 via hinge members 5 at the lower end of each side wall 3. Each side wall 3 is provided with an upper edge 10. The long side walls 31 are provided with flap members 7 (fig. 1) at the upper edge 10. The flap members 7 are moveably attached to the upper edge 10 via hinges 71 and are pivotable between an outwards position and an inwards position in which inwards position the flap members 7 act as a reinforcing means for the side wall and a stacking ledge for containers stacked on top of the collapsible container 1. The number of hinges 71 on each flap member 7 is four.

**[0025]** The upper edge 10 of the side wall 31, on which a flap member 7 is assembled is provided with a pivot axle 11 (fig. 3) intended to interact with the hinges 71 of the flap member 7.

**[0026]** The collapsible container 1 is adapted to receive deviating containers 1' of a design having a smaller base area than the collapsible container 1. Such deviating containers 1' may for example be so-called stack nest containers which are nestable by being provided with sloping sides which will give the container a so-called footprint which is much smaller than the area at the upper rim of the same container. This will cause a problem since the load transferred from such a container will be applied at some distance from the load carrying corners of the collapsible container 1 when a nestable container is placed on top of this. The collapsible container 1 is provided with V-shaped load collectors 12 connected to the upper edge 10. The V-shaped load collectors are arranged at positions corresponding to the corners of the footprint of the deviating container 1'. The upper edge 10 is constituted by a hollow profile achieved through injection moulding. The hollow profile suitably stretches along the two short sides and the upper edge 10 of the side walls 31. Some of the pivot axes 11 (fig. 3) of the hinge are suitably placed so that the V-shaped

load collector 12 is used as a bypass for the hollow profile. The lower edge of the V-shaped load collector 12 is connected to a vertical profile 13 which transfers the load to the lower side of the collapsible container 1.

## Claims

1. Container system comprising a collapsible container (1) and a deviating container (1') having a smaller base area than said collapsible container (1), the collapsible container (1) being adapted to support said deviating container (1') in a stacked manner, the collapsible container (1) being provided with a base (2) and four side walls (3) having upper edges (10) said walls (3) being attached to the base (2) via hinge members (5) at the lower end of each side wall (3), outer edges (23, 24) of said side walls (3) being provided with coupling members (6) for guiding and possibly locking adjacent side walls (3) to each other in an erected position,

two longer ones (31) of the side walls (3) being provided with flap members (7) being moveably attached to the upper edges (10) thereof via hinges (71) and being pivotable between an outward position and an inward position in which inward position the flap members (7) act as a reinforcing means for the side walls (3) and as a stacking ledge for the deviating container (1') stacked on top of the collapsible container (1),

### characterized in that

said upper edges (10) of the side walls (3) are constituted by a hollow profile achieved through injection moulding, said longer side walls (31) are provided with V-shaped load collectors (12) connected to the upper edges (10) thereof, the V-shaped load collectors (12) being arranged at positions corresponding to the corners of the footprint of the deviating container (1') when stacked onto the collapsible container (1), the upper edges (10) of the side walls (31) are furthermore provided with pivot axles (11) which are intended to interact with the hinges (71) of the flap members (7), wherein some of the pivot axles (11) are suitably placed so that the V-shaped load collectors (12) are used as a bypass for the hollow profile.

2. Container system according to claim 1, **characterized in that** the flap members (7) are provided with ends (72) at which ends (72) flap locking means (73) are arranged, which flap locking means (73) are intended to engage edge locking means (8) arranged at the edge (10) of an adjacent side wall (3) whereby adjacent side walls (3) may be securely fixated to each other.
3. Container system according to claim 1 or 2, **characterized in that** the hinges (71) of the flap mem-

bers (7) are in the form of loop-shaped snap assembly hinges, which hinges (71) are evenly distributed over the entire length of the side wall (31) the flap member (7) is attached to, whereby the number of hinges (71) on each flap member (7) is at least three.

4. Container system according to claim 1 or 2, **characterized in that** the hinges (71) of the flap member (7) are in the form of loop-shaped snap assembly hinges, which hinges (71) are evenly distributed over the entire length of the side wall (31) the flap member is attached to, and that the distance between two hinges (7) does not exceed 75 % of the length of the upper edge (10) of the side wall (31).
5. Container system according to claim 1 or 2, **characterized in that** the hinges (71) of the flap members (7) are in the form of loop-shaped snap assembly hinges, which hinges (71) have a length exceeding 50% of the length of the upper edge (10) of the side wall (38).
6. Container system according to any one of claims 1 - 5, **characterized in that** the flap member (7) is storable on the outside of the collapsible container (1) when not in use, whereby the storage space on the inside of the container becomes easier to access during emptying and filling of the container.
7. Container system according to any one of claims 1 - 6, **characterized in that** the lower edge of the V-shaped load collector (12) is connected to a vertical profile (13) which transfers the load to the lower side of the collapsible container (1).

## Patentansprüche

1. Behältersystem mit einem zusammenlegbaren Behälter (1) und einem abweichenden Behälter (1') mit einer kleineren Grundfläche als der zusammenlegbare Behälter (1), wobei der zusammenlegbare Behälter (1) den abweichenden Behälter (1') auf gestapelte Art und Weise unterstützen kann, wobei der zusammenlegbare Behälter (1) mit einer Basis (2) und vier Seitenwänden (3) mit oberen Kanten (10) versehen ist, die Seitenwände (3) an ihrem unteren Ende über Scharnierelemente (5) an der Basis (2) angebracht sind, und Außenkanten (23, 24) der Seitenwände (3) mit Kopplungselementen (6) zum Führen und möglicherweise Verriegeln von benachbarten Seitenwänden (3) miteinander in einem aufrechten Zustand versehen sind, wobei zwei längere (31) der Seitenwände (3) mit Klappenelementen (7) versehen sind, die beweglich an den oberen Teilen (10) dieser Seitenwände (3) über Scharniere (71) angebracht sind und zwi-

schen einer auswärtigen Position und einer einwärtigen Position schwenkbar sind, in welcher einwärtigen Position die Klappenelemente (7) als Verstärkungsmittel für die Seitenwände (3) dienen sowie als Stapelleiste für den abweichenden Behälter (1'), der auf dem zusammenlegbaren Behälter (1) gestapelt ist,

**dadurch gekennzeichnet, dass**

die oberen Kanten (10) der Seitenwände (3) durch ein durch Spritzgießen ausgebildetes Hohlprofil gebildet sind, und

die längeren Seitenwände (31) mit V-förmigen Lastsammlern (12) versehen sind, die mit den oberen Kanten (10) dieser Seitenwände verbunden sind und an Positionen angeordnet sind, die den Ecken des Fußabdrucks des abweichenden Behälters (1') entsprechen, wenn dieser auf den zusammenlegbaren Behälter (1) gestapelt ist, wobei die oberen Kanten (10) der Seitenwände (31) außerdem mit Schwenkachsen (11) versehen sind, die mit den Scharnieren (71) der Klappenelemente (7) zusammenwirken sollen, worin einige dieser Schwenkachsen (11) geeignet so platziert sind, dass die V-förmigen Lastensammler (12) als Umgehung für das Hohlprofil verwendet werden.

2. Behältersystem nach Anspruch 1, **dadurch gekennzeichnet, dass** die Klappenelemente (7) mit Enden (72) versehen sind, an welchen Klappenarretiermittel (73) angeordnet sind, die mit Kantenarretiermitteln (8) in Eingriff geraten sollen, die an der Kante (10) einer benachbarten Seitenwand (3) angeordnet sind, wodurch benachbarte Seitenwände (3) sicher aneinander befestigt werden können.

3. Behältersystem nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** die Scharniere (71) der Klappenelemente (7) die Form von schleifenförmigen Schnappverbindungsscharnieren haben, die gleichmäßig über die gesamte Länge der Seitenwand (31) verteilt sind, an der das Klappenelement (7) angebracht ist, wobei die Anzahl der Scharniere (71) an jedem Klappenelement (7) zumindest drei ist.

4. Behältersystem nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Scharniere (71) des Klappenelements (7) die Form von schleifenförmigen Schnappverbindungsscharnieren haben, die über die gesamte Länge der Seitenwand (31) gleichmäßig verteilt sind, an der das Klappenelement angebracht ist, und dass der Abstand zwischen zwei Scharnieren (71) 75% der Länge der oberen Kante (10) der Seitenwand (31) nicht überschreitet.

5. Behältersystem nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Scharniere (71) der

Klappenelemente (7) die Form von schleifenförmigen Schnappverbindungsscharnieren haben, die eine Länge haben, die 50% der Länge der oberen Kante (10) der Seitenwand (31) überschreitet.

6. Behältersystem nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** das Klappenelement (7) auf der Außenseite des zusammenlegbaren Behälters aufbewahrbar ist, wenn es nicht verwendet wird, wodurch der Raum auf der Innenseite des Behälters während des Entleerens und Befüllens des Behälters leichter zugänglich wird.

7. Behältersystem nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** die untere Kante des V-förmigen Lastsammlers (12) mit einem vertikalen Profil (13) verbunden ist, das die Last auf die Unterseite des zusammenlegbaren Behälters (1) überträgt.

## Revendications

1. Système de bacs comprenant un bac repliable (1) et un bac évasé (1') comportant une surface de base plus petite que celle dudit bac repliable (1), le bac repliable (1) étant conçu pour supporter ledit bac évasé (1') d'une manière empilée,

le bac repliable (1) étant muni d'une base (2) et de quatre parois latérales (3) comportant des bords supérieurs (10), lesdites parois (3) étant fixées à la base (2) par l'intermédiaire d'éléments de charnières (5) à l'extrémité inférieure de chaque paroi latérale (3), les bords extérieurs (23, 24) desdites parois latérales (3) étant munis d'éléments d'accouplement (6) destinés à guider et éventuellement à bloquer les parois latérales adjacentes (3) l'une à l'autre dans une position dressée,

les deux parois les plus longues (31) des parois latérales (3) étant munies d'éléments de rabats (7) qui sont fixés de façon mobile aux bords supérieurs (10) de celles-ci par l'intermédiaire de charnières (71) et qui peuvent pivoter entre une position vers l'extérieur et une position vers l'intérieur, dans laquelle position vers l'intérieur les éléments de rabats (7) agissent comme un moyen de renfort pour les parois latérales (3) et comme un rebord d'empilement pour le bac évasé (1') empilé sur le bac repliable (1),

### caractérisé en ce que

lesdits bords supérieurs (10) des parois latérales (3) sont constitués par un profilé creux obtenu grâce à un moulage par injection,

lesdites parois latérales les plus longues (31) sont munies de collecteurs de charge en forme de V (12) reliés aux bords supérieurs (10) de celles-ci, les collecteurs de charge en forme de V (12) étant agencés à des positions correspondant aux coins

de l'encombrement à la base du bac évasé (1') lorsqu'il est empilé sur le bac repliable (1), les bords supérieurs (10) des parois latérales (31) sont en outre munis d'axes de pivot (11) qui sont destinés à interagir avec les charnières (71) des éléments de rabats (7), où certains des axes de pivot (11) sont placés de façon appropriée de sorte que les collecteurs de charge en forme de V (12) soient utilisés comme une déviation pour le profilé creux.

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2. Système de bacs selon la revendication 1, **caractérisé en ce que** les éléments de rabats (7) sont munis d'extrémité (72), au niveau desquelles extrémités (72) des moyens de blocage de rabats (73) sont agencés, lesquels moyens de blocage de rabats (73) sont destinés à s'engager avec des moyens de blocage de bord (8) agencés au niveau du bord (10) d'une paroi latérale adjacente (3), grâce à quoi les parois latérales adjacentes (3) peuvent être fixées de façon sûre les unes aux autres.

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3. Système de bacs selon la revendication 1 ou 2, **caractérisé en ce que** les charnières (71) des éléments de rabats (7) sont sous la forme de charnières à assemblage par encliquetage en forme de boucle, lesquelles charnières (71) sont réparties régulièrement sur toute la longueur de la paroi latérale (31) à laquelle l'élément de rabat (7) est fixé, grâce à quoi le nombre de charnières (71) sur chaque élément de rabat (7) est au moins de trois.

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4. Système de bacs selon la revendication 1 ou 2, **caractérisé en ce que** les charnières (71) de l'élément de rabat (7) sont sous la forme de charnières à assemblage par encliquetage en forme de boucle, lesquelles charnières (71) sont réparties régulièrement sur toute la longueur de la paroi latérale (31) à laquelle l'élément de rabat est fixé, et **en ce que** la distance entre deux charnières (7) n'excède pas 75 % de la longueur du bord supérieur (10) de la paroi latérale (31).

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5. Système de bacs selon la revendication 1 ou 2, **caractérisé en ce que** les charnières (71) des éléments de rabats (7) sont sous la forme de charnières à assemblage par encliquetage en forme de boucle, lesquelles charnières (71) ont une longueur dépassant 50 % de la longueur du bord supérieur (10) de la paroi latérale (31).

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6. Système de bacs selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** l'élément de rabat (7) peut être rangé sur l'extérieur du bac repliable (1) lorsqu'il n'est pas utilisé, grâce à quoi l'espace de rangement à l'intérieur du bac devient plus facile d'accès durant le vidage et le remplissage du bac.

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7. Système de bacs selon l'une quelconque des revendications 1 à 6, **caractérisé en ce que** le bord inférieur du collecteur de charge en forme de V (12) est relié à un profilé vertical (13) qui transfère la charge vers le côté inférieur du bac repliable (1).

Fig. 1

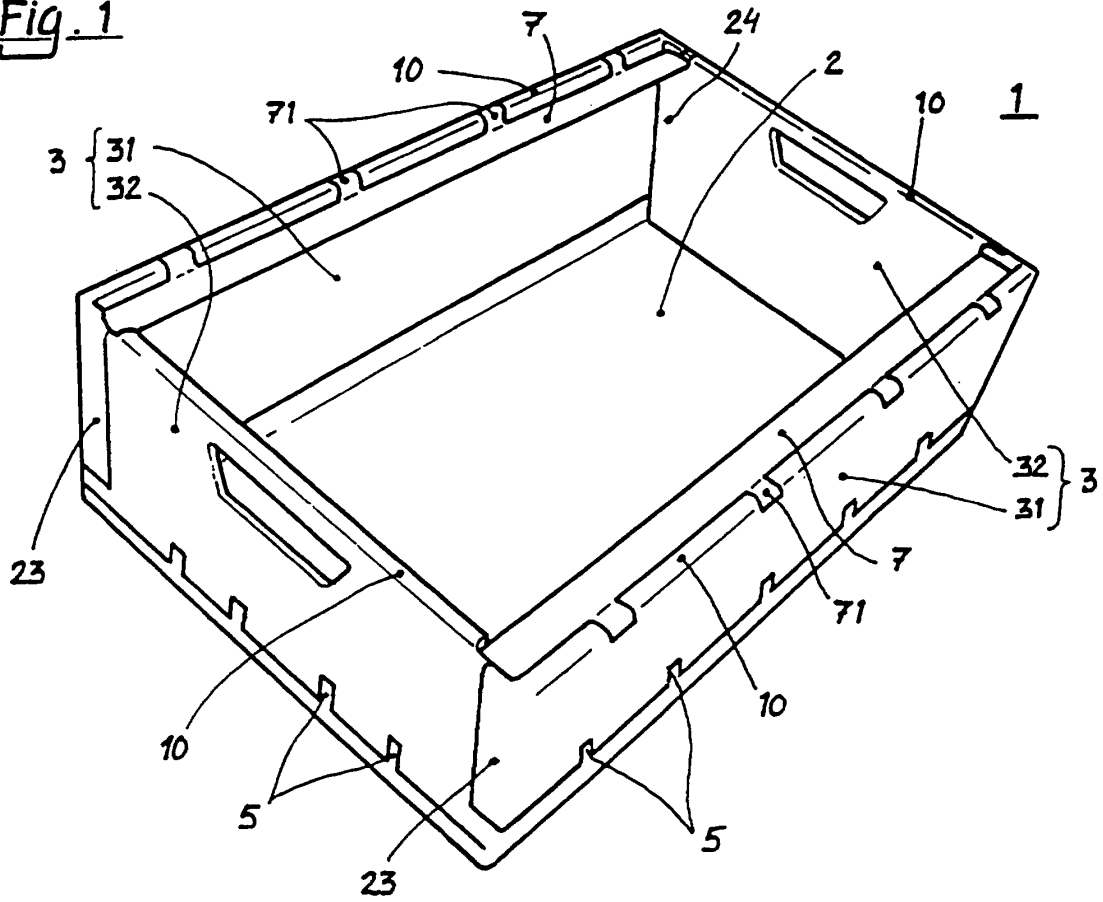


Fig. 2

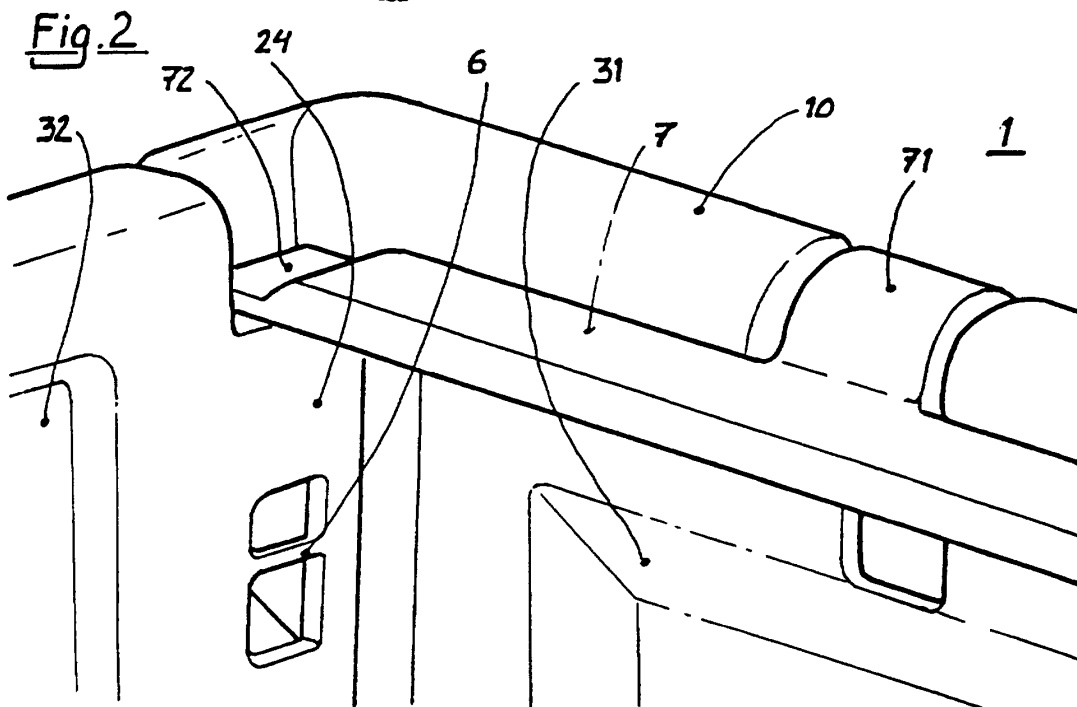


Fig. 3

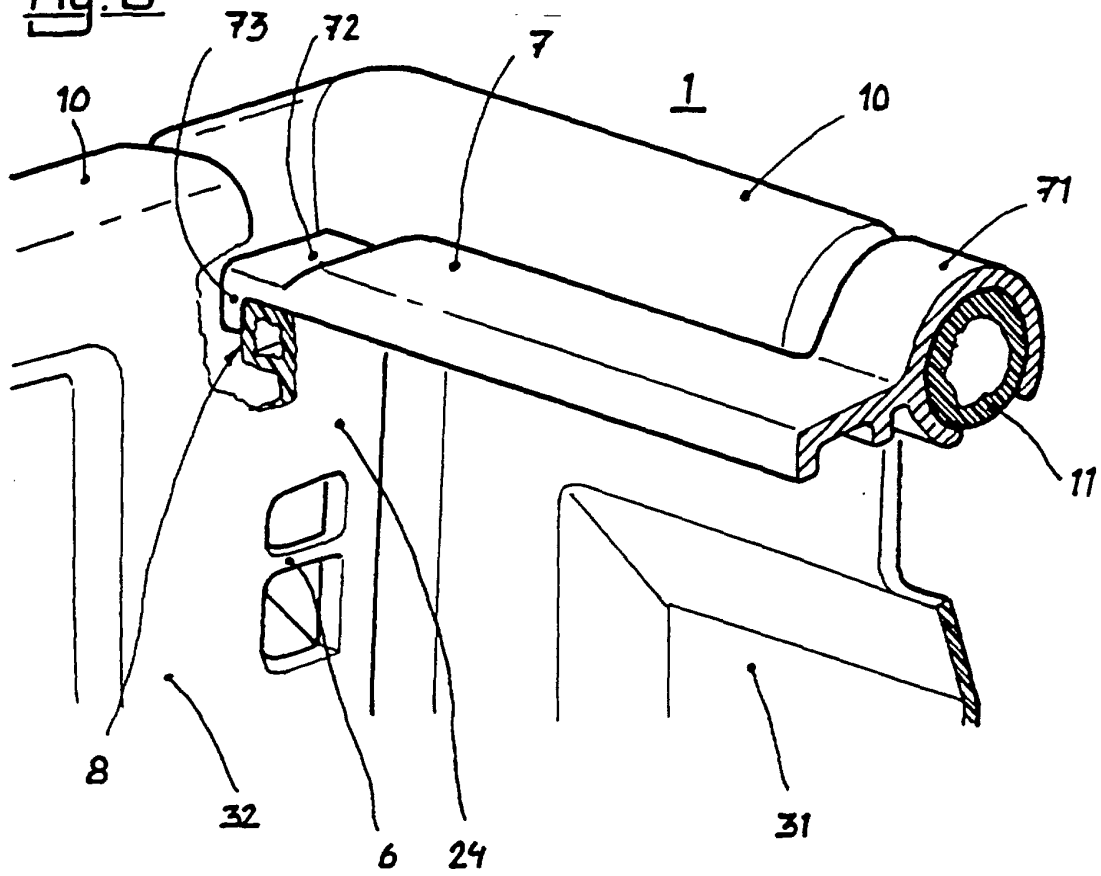


Fig. 4

