



(11)

EP 1 671 887 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.06.2006 Bulletin 2006/25

(51) Int Cl.:
B65D 5/00 (2006.01) B65D 5/42 (2006.01)

(21) Application number: **04425926.5**

(22) Date of filing: **17.12.2004**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL BA HR LV MK YU

(72) Inventor: **Bressan, Roberto**
33077 Sacile (Pordenone) (IT)

(74) Representative: **Gotra, Stefano**
BUGNION S.p.A.
Via Emilia Est 25
41100 Modena (IT)

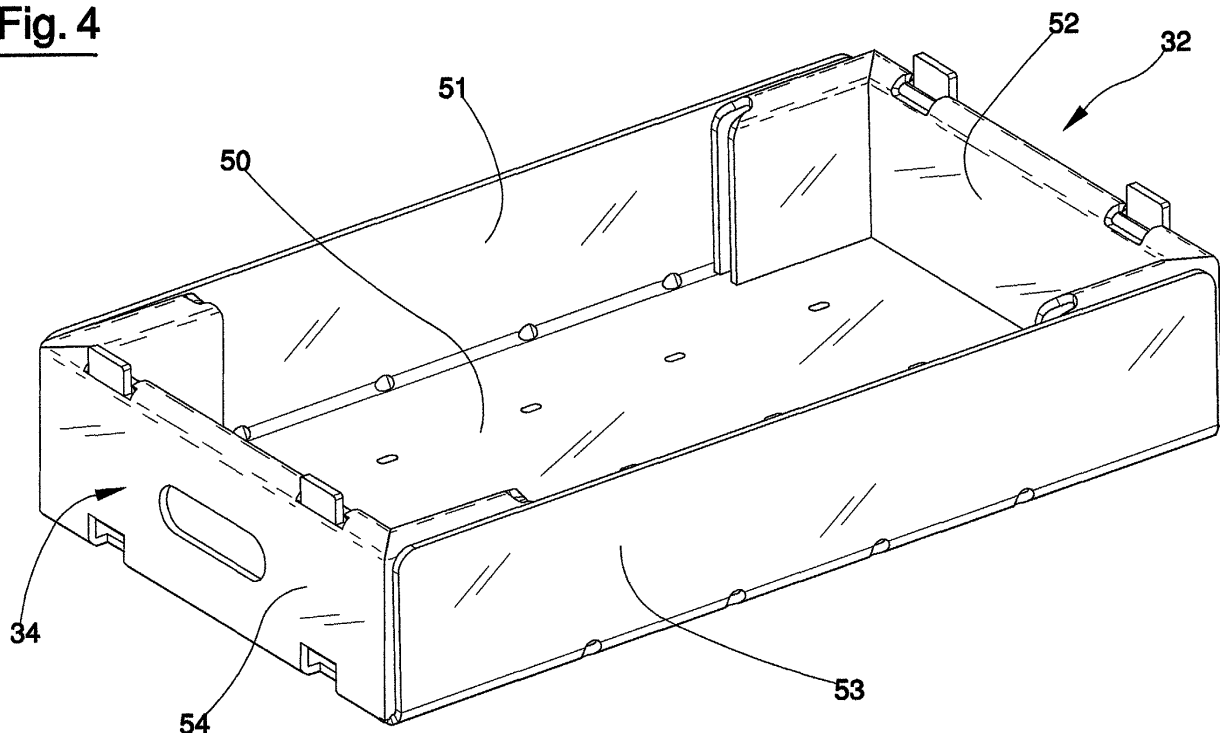
(71) Applicant: **Karton S.p.A.**
33077 Sacile (PN) (IT)

(54) **A reinforced crate container made from a flat blank**

(57) The container is assembled from a blank (1) which comprises external cut lines, which define a shape thereof, internal fold lines (11, 12, 13, 14) which connect the rectangular bottom wall (50) of the container with the

lateral walls (51, 52, 53, 54) of the container, and reinforcement parts (62, 64), each of which defines a reinforcement of the wall (52, 54) and the corners of the container.

Fig. 4



EP 1 671 887 A1

Description

[0001] The container of the invention is made from a blank sheet and is usefully applied in particular, but not only, to replace wooden crates for containing products of various types.

[0002] For containing, transport and display of products of various types, for example food produce such as fruit, vegetables, fish, wooden crates are often used because of their durability; in particular, for heavy products, cardboard and similar material crates are not preferred, including cardboard covered in plastic material, plastic materials and other foldable materials which, in order to guarantee adequate sturdiness, must be particularly heavy or in any case more robust than the usual materials of this type.

[0003] The main aim of the present invention is to provide a crate-container which is made of a foldable material which, though maintaining its characteristics of lightness and cheapness, offers the benefit of supporting considerably greater weights than those supported by existing crate-containers of equal weight.

[0004] An advantage of the present invention is that it provides a container in the form of a crate which is easy and economical to make, starting from a blank sheet. A further advantage of the present invention is that it provides a crate container which is provided with a strong and safe grip to be manually lifted by.

[0005] These aims and more besides are all attained by the invention as it is characterised in the claims that follow.

[0006] Further characteristics and advantages of the present invention will better emerge from the detailed description that follows, of a preferred but non-exclusive embodiment of the invention, illustrated purely by way of example in the appended figures of the drawings, in which:

figure 1 is a plan view of a blank which the container of the invention is made out of;
 figures 2 and 3 show the subsequent stages of assembly of the lateral walls of the container;
 figure 4 is a perspective view of the assembled container.

[0007] The container 2 is made from a flat blank, made of a sheet of cardboard, plastic-covered cardboard, of plastic or of another foldable material of known type and suitable for the purpose. In particular, a sheet of cellular polypropylene is preferred, as this type of material, apart from being very flexible and resistant to wear, is waterproof and can easily be heat-welded with considerable advantages in particular during the assembly of the container. Normally, though not exclusively, cellular polypropylene sheets are used which have a thickness comprised between 2 and 8 millimetres according to the characteristics of the object to be realised.

[0008] Once formed, the container has a parallelepiped shape, open superiorly and defined by a bottom wall

50 and lateral walls, rectangular and of equal height, of which more will be explained herein below. The external dimensions of the container obtained can be varied and do not constitute a limitation. The container may also be provided with a lid or other convenient covering.

[0009] The blank from which the container is formed is flat and delimited by external cut lines which define the shape and development thereof.

[0010] Internal fold lines 11, 12, 13 and 14 connect a central part of the blank, which are destined to define a rectangular bottom wall 50 of the container, with other rectangular parts of the blank being destined to define, once folded along the fold lines, four lateral walls 51, 52, 53 and 54 or at least part of four lateral walls. In particular, oppositely-situated parts 51 and 53 are destined to constitute the "long walls" of the rectangular container, while opposite parts 52 and 54 are destined, together with other elements of the blank which will be better described herein below, to define the "short walls" of the container. Holes for drainage or aeration are preferably made on the bottom wall 50 and along the fold lines 11 and 12.

[0011] The blank is provided with two axes of symmetry, perpendicular to one another. Though more detail will be given herein below about the parts of the blank which make up the elements of the container, it is well to note now that given the symmetry of the blank, the elements making up one side and the opposite side and the elements which make up the four corners of the container are equal.

[0012] Reinforcement flaps 52a and 52b are connected to the lateral wall 52 by internal fold lines 11a and 13a, made on two opposite sides of the wall and perpendicular to the fold line 12; the lateral wall 52 and the reinforcement flaps 52a and 52b constitute a first group 32 of elements of the blank. Similarly, reinforcement flaps 54a and 54b are connected to the lateral wall 54 by internal fold lines 11b and 13b, made on two opposite sides of the wall and perpendicular to the fold line 14; the lateral wall 54 and the reinforcement flaps 54a and 54b constitute a second group 34 of elements of the blank.

[0013] The blank further comprises a first reinforcement part 62 which is provided with reinforcement flaps 62a, 62b which are provided on two opposite sides of the reinforcement part 62. The reinforcement part 62 is destined to be folded on the lateral wall 52 and is connected thereto by two fold lines 15 and 15a which define internally thereof an element 72 of a predetermined width; the width of this element determines, as will be seen herein below, the thickness of the short wall of the container. The reinforcement flaps 62a, 62b are connected to the first reinforcement part 62 by a pleated zone, respectively 17 and 18, which is provided with a plurality of parallel fold lines; the pleated zone 17 is located in axis with the fold line 11a between the wall 52 and the reinforcement flap 52a, while the pleated zone 18 is located in axis with the fold line 13a which is between the wall 52 and the reinforcement flap 52b. The reinforcement flaps 62a and

62b are further respectively connected to the reinforcement flap 52a and the reinforcement flap 52b, located on the wall 52, by fold lines which are the prolongations of the fold lines 15 and 15a.

[0014] At the internal and external ends of each of the pleated zones 17 and 18 there are two triangular openings, respectively 17a and 18a, which are right-angled isosceles triangles and are arranged with the points located respectively in the direction of the fold lines 11a and 13a and facing towards the inside of the blank when assembled.

[0015] The wall 52 exhibits a slot opening 42 which is of a size such as to allow passage of a hand; the reinforcement part 62 does not exhibit any opening. In the wall 52 there are rectangular openings, and internal cuts defining, when the container is assembled, projections destined to insert in the internal openings of another container when the containers are piled one on top of another; these openings and internal cuts are usual in known containers assembled from blanks.

[0016] The first part of the reinforcement 62 and the reinforcement flaps 62a and 62b constitute a third group 32a of elements of the blank.

[0017] Similarly on the opposite part to the part including the first and third groups of above-described elements, the blank comprises a second part of reinforcement 64 which is provided with reinforcement flaps 64a, 64b which are provided on two opposite sides of the reinforcement part 64. The reinforcement part 64 is destined to be folded on the lateral walls 54 and is connected thereto by two fold lines 16 and 16a which define internally thereof an element 74 of a predetermined width; the width of this element determines, as will be seen herein below, the thickness of the short wall of the container. The reinforcement flaps 64a, 64b are connected to the reinforcement part 64 by a pleated zone, respectively 19 and 20, which is provided with a plurality of parallel fold lines; the pleated zone 19 is located in axis with the fold line 11b between the wall 54 and the reinforcement flap 54a, while the pleated zone 20 is located in axis with the fold line 13b which is between the wall 54 and the reinforcement flap 54b.

[0018] The reinforcement flaps 64a and 64b are further respectively connected to the reinforcement flap 54a and the reinforcement flap 54b, located on the wall 54, by fold lines which are the prolongations of the fold lines 16 and 16a.

[0019] At the internal and external ends of each of the pleated zones 19 and 20 there are two triangular openings, respectively 19a and 20a, which are right-angled isosceles triangles and are arranged with the points located respectively in the direction of the fold lines 11b and 13b and facing towards the inside of the blank when assembled.

[0020] As with the wall 52, the wall 54 exhibits a slot opening 44 which is of a size such as to allow passage of a hand; the reinforcement part 64 does not exhibit any opening. In the wall 54 there are rectangular openings,

and internal cuts which have the same functions as those in relation to the wall 52.

[0021] The second reinforcement part 64 and the reinforcement flaps 64a and 64b constitute a fourth group 34a of elements of the blank.

[0022] The first, second, third and fourth groups of elements of the blank all have a same length and width.

[0023] The above-described blank enables the container to be obtained and is assembled in the following way. The description relates to the first group 32 and the third group 32a of elements, but is equally valid in relation to the second group 34 and the fourth group 34a of elements.

[0024] The third group 32a is folded along the fold lines 15 and 15a, and thus is superposed on the first group 32 (figure 1); the group 32a is however distanced from the first group 32 by a distance which is equal to the width of the element 72 which defines the width of the lateral wall of the container which is being formed.

[0025] The first and third group, thus superposed, are then folded by 90° along the fold line 12 and are arranged perpendicular to the bottom wall 50. Then the flaps 52a and 62a, superposed on one another like the flaps 52b and 62b, also reciprocally superposed, are folded by 90° with respect to the side wall 52 and the part of reinforcement 62, which are reciprocally superposed (figure 3); this folding operation is made possible by the presence of the pleated zones 17 and 18 and the triangular openings 17a and 18a which make possible a 90° fold on a considerably thick wall (about 1-2 centimetres). The folded parts are then solidly connected at the pleated zones 17, 18. The lateral walls 51 and 53 are then folded by 90° along the fold lines, respectively 11 and 13, and their ends are solidly connected externally, at flaps 52a and 52b.

[0026] As previously mentioned, these operations are performed equally for the second group 34 and the fourth group 34a of elements, which will make up the opposite side of the container from the one formed by the operations performed on the first and third groups of elements.

[0027] In the case of a blank made of a sheet of cellular polypropylene, the above connections between the parts of the blank are preferably achieved using heat-welding; with different materials, for example cardboard, other suitable systems will be used, for example glueing or the like. To perform these connections, a small tab can be fashioned on the external part of the blank which can insert in a slot made in the bottom wall.

[0028] With the described blank, and the described operations on the blank, the crate container of the invention is obtained, which is illustrated in its entirety in figure 4. The characteristics that the special conformation of the lateral edges and the short walls give to the container are a high resistance to torsion and a load capacity which, in direct comparison of type and weight of known containers, is greater. Also, the fact that the openings 42 and 44, with which the container can be manually lifted, are not through-openings gives the container a further de-

gree of sturdiness and ensures greater hygiene for the transported product.

[0029] Furthermore, and this is very obvious even from a cursory observation of how the blank used to make the container develops, there is a minimum waste of material as the final blank is basically the same shape and size of a common rectangular sheet of the material used for making the blank.

Claims

1. A reinforced crate container (2), made from a flat blank (1) comprising: external cut lines defining a flat development and shape of the blank; internal fold lines (11, 12, 13, 14), which connect a part of the blank, destined to define a rectangular bottom wall (50) of the container, respectively with parts of the blank which are destined to define four lateral walls (51, 52, 53, 54) of the container and which are foldable in order to give the blank a container shape; reinforcement flaps (52a, 52b) connected to the lateral wall (52) by internal fold lines (11a, 13a), reinforcement flaps (54a, 54b) which are connected to the lateral wall (54) by internal fold lines (11b, 13b); a first reinforcement part (62), provided with reinforcement flaps (62a, 62b), which is destined to be folded on the lateral wall (52) and connected thereto; a second reinforcement part (64), provided with reinforcement flaps (64a, 64b), destined to be folded on the lateral wall (54) and connected thereto; **characterised in that** each of the reinforcement parts (62, 64) is connected to the respective lateral wall (52, 54) by a pair of fold lines (15, 15a and 16, 16a) which defined internally thereof an element (72 and 74) of a predetermined width; the reinforcement flaps (62a, 62b) are each connected to the first reinforcement part (62) by a pleated zone (17, 18) provided with a plurality of parallel fold lines located axially respectively with the fold line (11a) between the lateral wall (52) and the reinforcement flap (52a) and the fold line (13a) between the lateral wall (52) and the reinforcement flap (52b); the reinforcement flaps (64a, 64b) are each connected to the second reinforcement part (64) by a pleated zone (19 and 20) which is provided with a plurality of parallel fold lines located axially respectively with the fold line (11b) between the lateral wall (54) and the reinforcement flap (54a) and the fold line (13b) between the lateral wall (54) and the reinforcement flap (54b).
2. The container of claim 1, **characterised in that** the lateral wall (52) and the reinforcement flaps (52a, 52b) constitute a first group (32) of elements of the blank; the lateral wall (54) and the reinforcement flaps (54a, 54b) constitute a second group (34) of elements of the blank; the first reinforcement part (62) and the reinforcement flaps (62a, 62b) consti-

tute a third group (32a) of elements of the blank; the second reinforcement part (64) and the reinforcement flaps (64a, 64b) constitute a fourth group (34a) of elements of the blank; the first, second, third and fourth groups of elements of the blank have a same length and width.

3. The container of claim 2, **characterised in that** at internal and external ends of each pleated zone (17, 18, 19, 20) there are triangular openings (17a, 18a, 19a, 20a) which are shaped as isosceles triangles and which are arranged with vertices thereof located respectively on a direction of the fold lines (11a, 13a, 11b, 13b).
4. The container of claim 3, **characterised in that** the third group (32a) and the fourth group (34a) are folded respectively along the fold lines (15, 15a) and (16, 16a) and respectively superpose on the first group (32) and the second group (34), the third group (32a) being distanced from the first group (32) and the fourth group (34a) being distanced from the second group (34) by a distance which is equal to the width of the elements (72 and 74); the first group (32) and the third group (32a), superposed, and the second group (34) and the fourth group (34a), superposed, are folded by 90° along the fold lines (12 and 14); the reinforcement flaps (52a, 62a), reciprocally superposed, and the reinforcement flaps (52b, 62b), reciprocally superposed, are folded by 90° with respect to the lateral wall (52) and the reinforcement part (62), reciprocally superposed, and are solidly connected respectively at the pleated zones (17, 18); the reinforcement flaps (54a, 64a), reciprocally superposed, and the reinforcement flaps (54b, 64b), reciprocally superposed are folded by 90° with respect to the lateral wall (54) and the reinforcement part (64), reciprocally superposed, and are solidly connected respectively at the pleated zones (19 and 20); the lateral walls (51 and 53) are folded by 90° along the respective fold lines (11 and 13) and ends thereof are solidly connected externally with respect to the reinforcement flaps (52a, 54a) and the reinforcement flaps (52b, 54b).
5. The container of claim 4, **characterised in that**: the blank (1) is made with a sheet of cellular polypropylene; the solid connections between the parts of the blank are achieved using heat-welding.
6. The container of claim 4, **characterised in that** the parts of the blank which are folded and reciprocally solidly connected define a parallelepiped container which is superiorly open.
7. The container of claim 1, **characterised in that** the lateral wall (52) and the lateral wall (54) each exhibit a slot opening (42, 44), of a size such as to permit

passage of a hand; the reinforcement part (62) and the reinforcement part (64) do not exhibit openings.

5

10

15

20

25

30

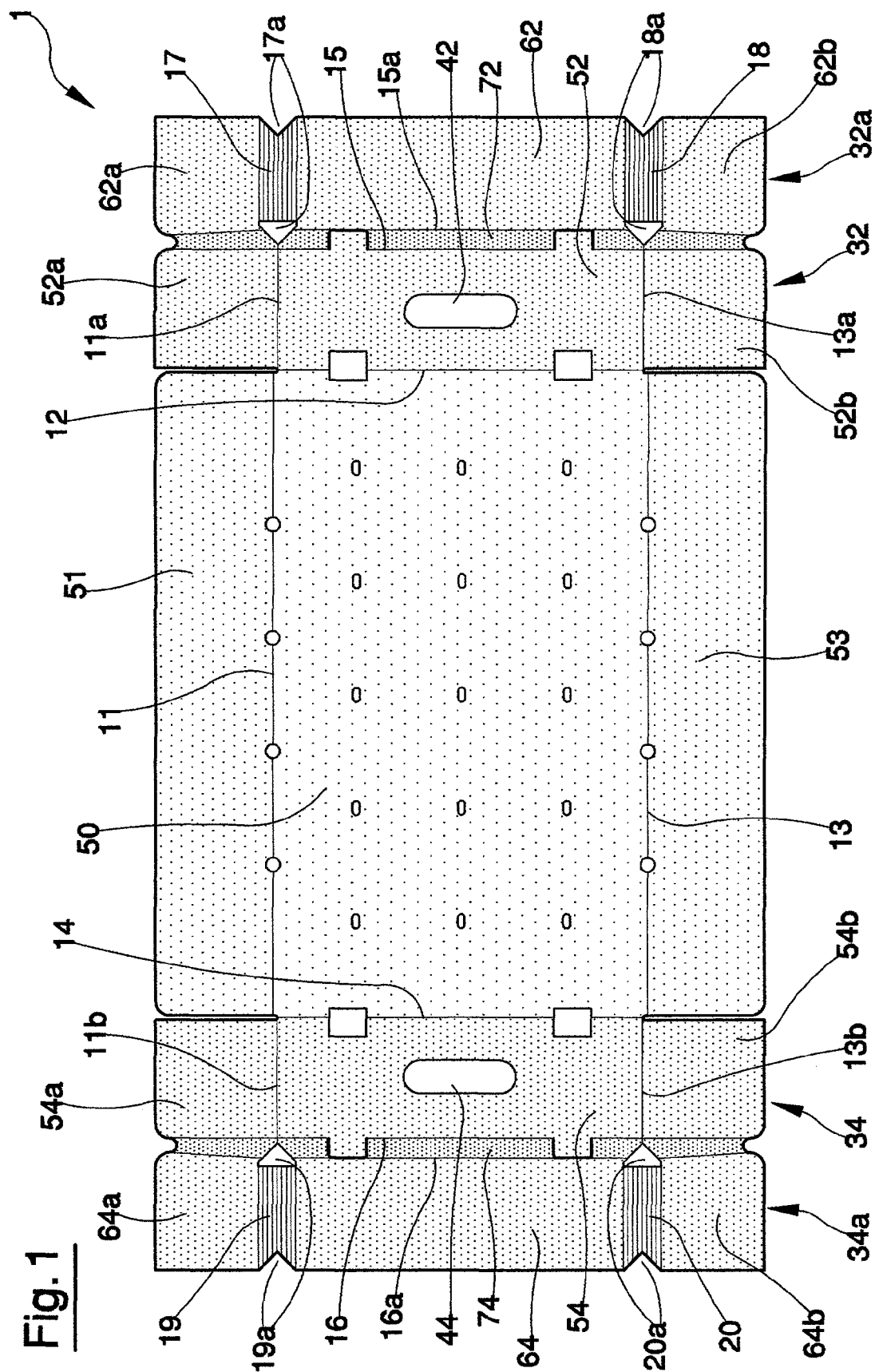
35

40

45

50

55



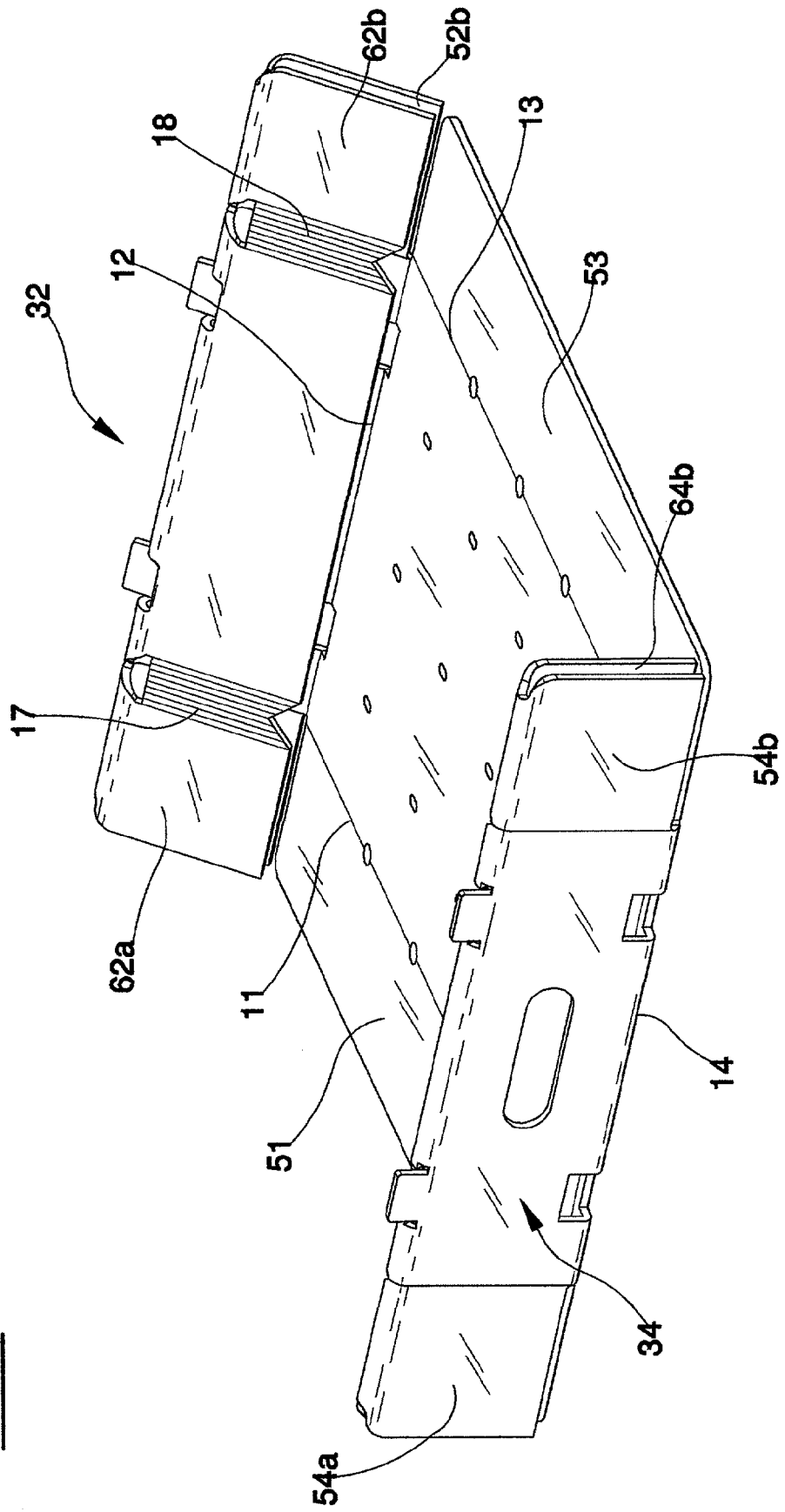


Fig. 2

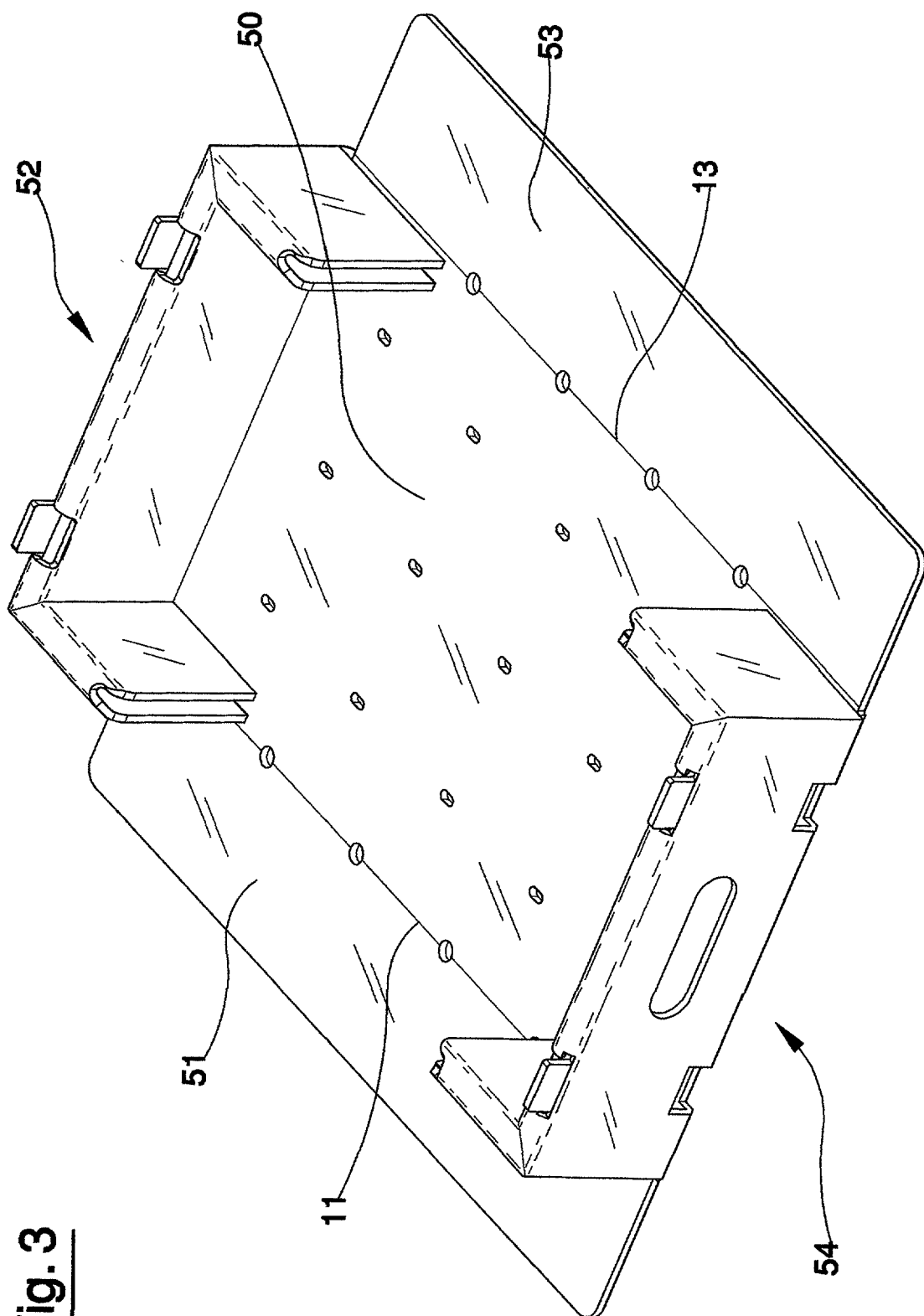


Fig. 3

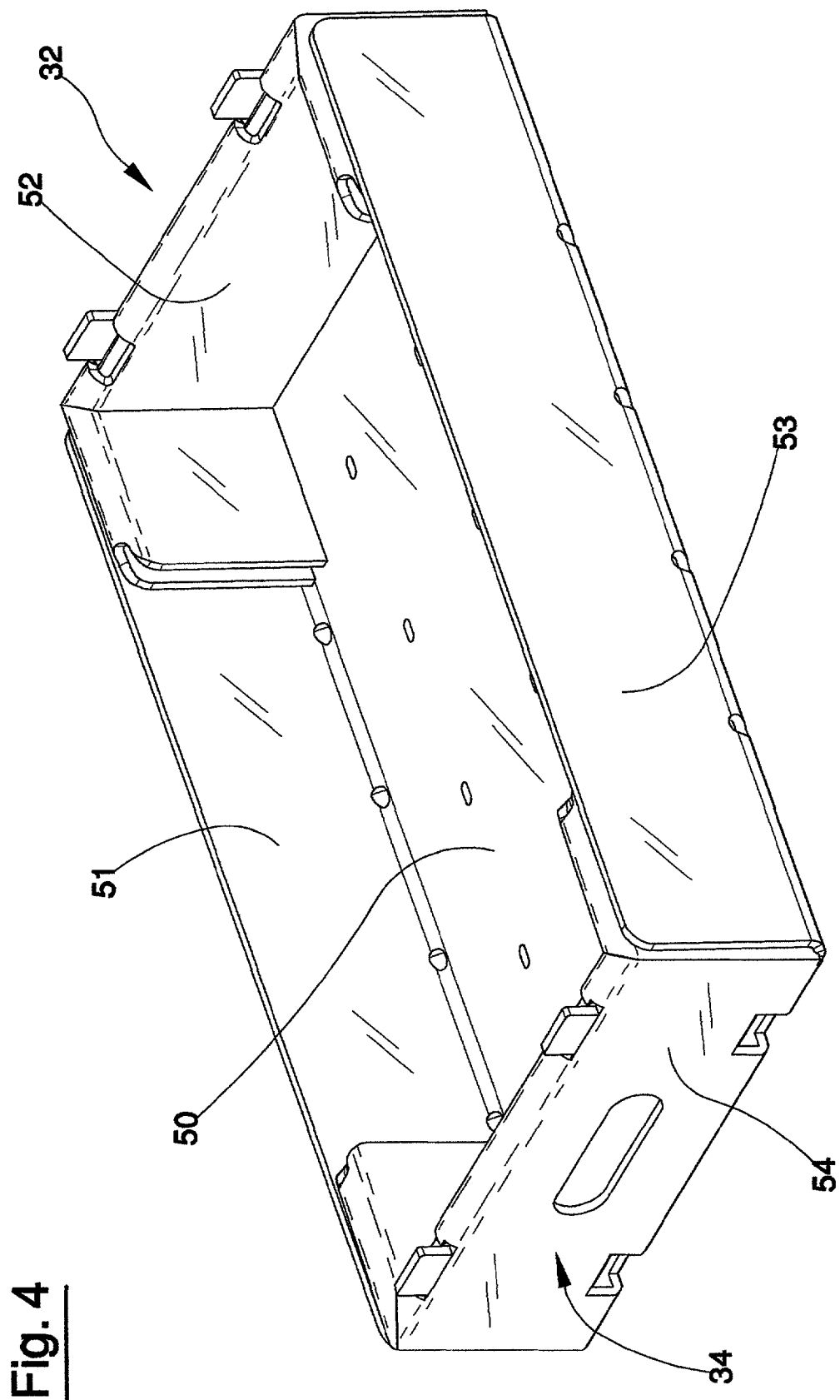


Fig. 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5926

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 588 751 A (MENGUAL ROBLES, LUCAS; BELMONTE MARTINEZ, AGUSTIN) 23 March 1994 (1994-03-23) * column 2, line 27 - column 3, line 23; figures *	1,2	B65D5/00 B65D5/42
A	-----	3,4,6,7	
A	GB 2 276 612 A (* S H W CONTAINERS) 5 October 1994 (1994-10-05) * page 1, paragraph 3; figures *	1,5,6	
A	-----		
A	DE 20 39 269 A1 (BURGER, KARL-HANS) 10 February 1972 (1972-02-10) * page 6, line 10 - line 17 * * page 7, line 2 - line 11; figures *	1-6	
A	-----		
A	US 5 125 568 A (BAUER ET AL) 30 June 1992 (1992-06-30) * abstract *	1-4,6	

			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 June 2005	Examiner Gino, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 42 5926

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-06-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0588751	A	23-03-1994	ES 1022387 U1	01-04-1993
			AT 159222 T	15-11-1997
			DE 69314588 D1	20-11-1997
			DE 69314588 T2	28-05-1998
			EP 0588751 A1	23-03-1994
			IL 106745 A	20-11-1997
			MA 22964 A1	01-04-1994

GB 2276612	A	05-10-1994	NONE	

DE 2039269	A1	10-02-1972	NONE	

US 5125568	A	30-06-1992	NONE	
