(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 484 599 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
08.08.2012 Bulletin 2012/32

(51) Int Cl.:
B65D 21/02 *(2006.01)*

(21) Application number: **11425033.5**

(22) Date of filing: **17.02.2011**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **04.02.2011 IT AN20110014**

(71) Applicant: **Plastica Sud - S.R.L. Di A. Caiazzo & C.**
84012 Angri (SI) (IT)

(72) Inventor: **Caiazzo, Giuseppe**
84012 Angri (SI) (IT)

(74) Representative: **Baldi, Claudio**
Viale Cavallotti, 13
60035 Jesi (AN) (IT)

(54) Box adapted to be stacked and inserted into another identical specimen of the same box.

(57) The present invention relates to a box (1) that can be stacked and inserted into another identical specimen of the same box; said box comprising a bottom wall (2) and four lateral sides (3), as well as four elevation columns (C), of which the first pair of columns (50) is situated on two diagonally opposite corners side by side with corresponding conduits with vertical axis (51), having the same height as the lateral sides (3), whereas the second pair of columns (60) has suitable shape and size to be completely inserted into said conduits with vertical axis (51) side by side with the first pair of columns (50).

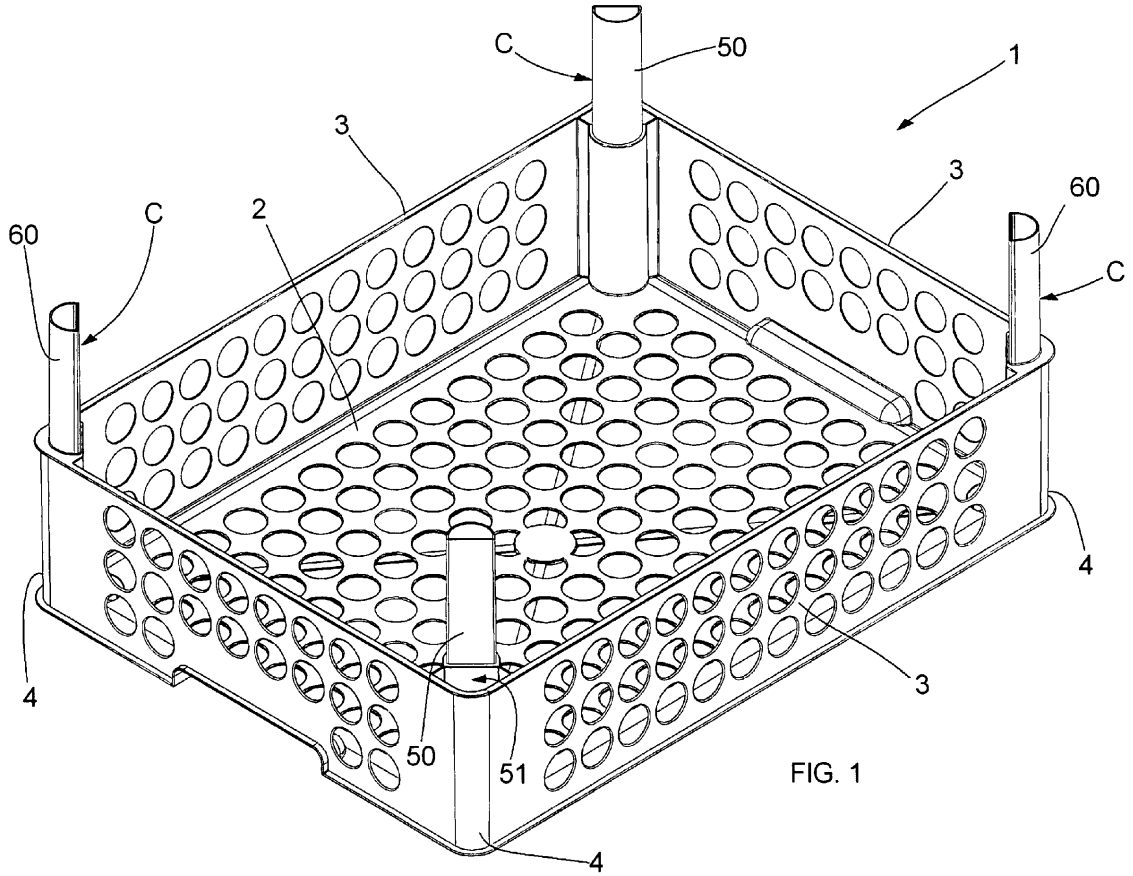

FIG. 1

EP 2 484 599 A1

Description

[0001] The present patent application for industrial invention relates to a box adapted to be stacked and inserted into another identical specimen of the same box.

[0002] More precisely, the box of the invention belongs to the type of monolithic plastic boxes composed of a rectangular bottom wall and four lateral sides with same height, characterized in that four identical columns protrude from the four corners of the box to support in elevated position - in a stack of similar boxes - the bottom wall of the upper box with respect to the horizontal loading mouth of the lower box.

[0003] Such a stacking condition allows for using the load capacity of the box at best, since the product stored in it can occupy a space larger than the volume laterally defined by said four sides, said bottom wall and said loading mouth.

[0004] In other words, this type of boxes can be loaded - without losing their capacity of being stacked - with products with such dimensions that they protrude above said mouth, such as for example, bottles higher than the height of the four lateral sides or oranges or coconuts having a higher diameter than the height of said four lateral sides.

[0005] In fact, in lack of said four elevation columns, the bottom wall of a box - when stacking multiple boxes loaded with goods - would touch the goods loaded in the box in immediately lower position, with poor balance conditions for the entire stack of boxes, provided that the goods are able to withstand the weight of the boxes in higher position in the stack without the risk of getting bruised or even broken.

[0006] Against such an advantage offered by similar boxes with elevation columns at the four corners, a significant drawback must be noted, which is experienced during storage or transportation in empty condition.

[0007] Evidently, the space taken by such a stack of empty boxes is higher than the one of identical boxes without elevation columns, the extent of such impairing difference being directly proportional to the height of the columns. The purpose of the present invention is to eliminate such a drawback by devising a new model of box provided with four elevation columns, which can be still stacked in empty condition with other specimens of identical boxes, with height volume equal to the volume of a similar stack of boxes of the type deprived of elevation columns at the four corners.

[0008] A further purpose of the invention is to devise a box with the aforementioned characteristics, the stacking of which is not impaired by compliance with a predefined stacking direction.

[0009] A further purpose of the invention is to devise a box with the aforementioned characteristics, which can be stacked and inserted in overturned position with respect to another identical specimen of the same box, while still ensuring perfect vertical alignment of the vertical sides of the lower box with respect to the corresponding sides of the upper box, so that the box of the invention can be "palletized" even if stacked in overturned position.

[0010] The above purposes have been achieved with the box of the invention, the main and secondary characteristics of which are respectively contained in the first claim and in the following dependent claims.

[0011] As mentioned above, the box of the invention belongs to the type of monolithic plastic boxes composed of a rectangular bottom wall and four vertical sides with same height, provided with four elevation columns protruding from the four corners of the box.

[0012] The peculiarity of the box of the invention lies in the fact that it is provided with two different pairs of columns in correspondence of the two pairs of diagonally opposite corners.

[0013] More precisely, the first pair of columns is situated side by side with a pair of corresponding conduits with vertical axis, having the same height as the lateral sides, whereas the second pair of columns has suitable shape and size to be completely inserted into said conduits with vertical axis. Obviously, said insertion can be obtained only between two identical specimens of the box, stacked in overturned position, that is to say with interfaced loading mouths.

[0014] In other words, when two boxes are empty, it is possible to firmly match them, one above the other, with one mouth against the other, in view of the fact that the second pair of columns can be inserted exactly and deeply into the pair of conduits with vertical axis side by side with the first pair of columns.

[0015] Vice versa, when stacking multiple boxes loaded with goods, the first and second pair of columns of the lower box provide elevated support of the box in immediately higher position.

[0016] For major clarity, the description of the box of the invention continues with reference to the enclosed drawings, which only have an illustrative, not limitative value, wherein:

- fig. 1 is an exploded axonometric top view of the box of the invention;
- fig. 2 is an exploded axonometric bottom view of the box of the invention;
- fig. 3 is a plan view of the box of the invention;
- fig. 4 is an exploded axonometric view of a pair of boxes of the invention that are normally stacked;
- fig. 5 is an exploded axonometric view of a pair of boxes of the invention that are about to be stacked in overturned position;
- fig. 6 is an axonometric view of a pair of boxes of the invention stacked in overturned position with loading mouths in contact;
- fig. 7 is a partial corner view of two stacked boxes sectioned with a vertical plane to show the tubular structure of said elevation columns;
- fig. 8 is a partial corner view of two boxes stacked in overturned position and sectioned with a vertical plane to show mutual coupling of said columns.

- fig. 9 is an axonometric view of four specimens of boxes stacked in overturned position, two by two;
- fig. 10 is a partial corner view of the stack of boxes of fig. 9, sectioned with a vertical plane to show mutual coupling of columns and bottom walls.

[0017] Referring to figs. 1, 2 and 3, the box (1) of the invention comprises a quadrangular bottom wall (2) and four vertical lateral sides (3), with vertical direction, intersecting at right angle in correspondence of the four angles of the bottom wall (2).

[0018] Four elevation columns (C) protrude from the four corners (4) of the box (1), all having the same height, but not the same position in their corner.

[0019] In particular, said columns (C) protrude from the mouth (5) of the box (1) by a value preferably equal or lower than the height of the lateral sides (3).

[0020] More precisely, the first pair of columns (50) is situated on two diagonally opposite corners side by side with corresponding conduits with vertical axis (51), having the same height as the lateral sides (3), so that their mouth (51a) is coplanar to the mouth (5) of the box (1).

[0021] The second pair of columns (60) - which is likewise situated on two diagonally opposite corners - has suitable shape and size to be completely inserted into said conduits with vertical axis (51) side by side with the first pair of columns (50).

[0022] According to the preferred embodiment of the box of the invention, each conduit (51) is situated close to the corner, whereas the column (50), which is associated with it, is situated far from the corner, but close to the conduit (51); in other words, it can be said that said conduit (51) is interposed between corner and column (50).

[0023] Each column (60), instead, is situated close to the corner, exactly like said conduit (51)

[0024] Because of the latter coincidence, when two identical specimens of the same box (1) are stacked in overturned position - as shown in figs. 5 and 6 - the columns (60) of the first box are perfectly aligned with the conduits (51) of the second box, so that said columns (60) can be inserted deeply inside said conduits (51), until the mouths (5) of the two specimens of box (1) get in mutual contact, as shown in fig. 6.

[0025] Such contact condition is obtained only if said columns (C) protrude from the mouth (5) of the box (1) by a value equal or lower than the height of the lateral sides (3).

[0026] According to the preferred embodiment of the box, shown in the attached drawings, the columns (50 and 60) have a tubular structure and cross-section with semicircle profile, as shown in fig. 7, where columns (50) and conduits (51) associated with them are sectioned with a vertical plane.

[0027] It must be noted that the external diameter (D1) of the upper mouth (52) of each column (50) is higher than the internal diameter (D2) of the lower mouth (53); such a difference allows for correct balanced stacking between two boxes (1), without the risk that the tip (50a) of a column (50) can get inserted and stuck in the base mouth (53) of the column (50) of a second specimen of box positioned above a first specimen of the same box. Moreover, attention is drawn on the fact that - in order to make centering between two specimens of stackable boxes easier and faster - a semicircular seat (54) with diameter (D3) higher than diameter (D2) is obtained in external position on said lower mouth (53).

[0028] Each conduit (51) is closed by a lower partition (55) with central hole (56) to drain water or any other liquid that has penetrated the conduit (51).

[0029] Collars (57) are obtained under said holes (56), practically acting as support feet for the box (1) in collaboration with other two identical collars (67) obtained in correspondence of the two angles with columns (60).

[0030] The first pair of collars (57) is aligned with the pair of conduits (51), whereas the second pair of collars (67) is off-centered with respect to the pair of columns (60).

[0031] It must be noted that the collars (67) are housed inside the semicircular seats (54) when multiple specimens of boxes are stacked in overturned position, as shown in figs. 9 and 10.

[0032] In the latter case said collars (57) are housed in a seat (64) obtained at the base of the lower mouth (62) of the columns (60), as shown in fig. 10.

[0033] In other words, it can be said that four seats are obtained under the bottom wall (2), in correspondence of the four corners, where the first pair of diagonally opposite seats (54) is aligned with the pair of columns (50), whereas the second pair of seats (64) is aligned with the pair of columns (60).

Claims

1. Box comprising a quadrangular bottom wall (2), four vertical lateral sides (3) intersecting at right angle in correspondence of the four angles of the bottom wall (2) as well as four elevation columns (C), all having the same height and situated at the four corners (4) of the box (1), **characterized in that** the first pair of columns (50) is situated on two diagonally opposite corners side by side with corresponding conduits with vertical axis (51), having the same height as the lateral sides (3), whereas the second pair of columns (60) - which is also situated on two diagonally opposite corners (4)

   - has suitable shape and size to be completely inserted into said conduits with vertical axis (51) side by side with the first pair of columns (50).

2. Box according to the above claim, **characterized in that**:

   - each conduit (51) is situated close to the corner,

whereas the column (50), which is associated with it, is situated far from the corner, but close to the conduit (51);
- each column (60) is situated close to the corner, exactly like said conduit (51)

in such a way that when two identical specimens of the box (1) are stacked in overturned position, the columns (60) of a specimen are perfectly aligned with the conduits (51) of the other specimen and vice versa.

3. Box as claimed in the above claim, **characterized in that** four collars protrude under the bottom wall (2), in correspondence of the four corners, where the first pair of collars (57) is aligned with the pair of conduits (51), whereas the second pair of collars (67) is misaligned with respect to the pair of columns (60).

4. Box as claimed in the above claim, **characterized in that** four seats are obtained under the bottom wall (2) in correspondence of the four corners, where the first pair of seats (54) is aligned with the pair of columns (50), whereas the second pair of seats (64) is aligned with the pair of columns (60).

5. Box as claimed in one or more of the above claims, **characterized in that** said collars (67) are adapted to be housed in the cavities (54), and said collars (57) are adapted to be housed in the seats (64).

6. Box as claimed in one or more of the above claims, **characterized in that** said columns (50 and 60) have a tubular structure.

7. Box as claimed in one or more claims of the above claims **characterized in that** said columns (50 and 60) have a cross-section with semicircle profile.

8. Box as claimed in one or more of the above claims, **characterized in that** said box (1) is molded in one piece.

9. Box as claimed in the above claim, **characterized in that** said box (1) is molded from plastics.

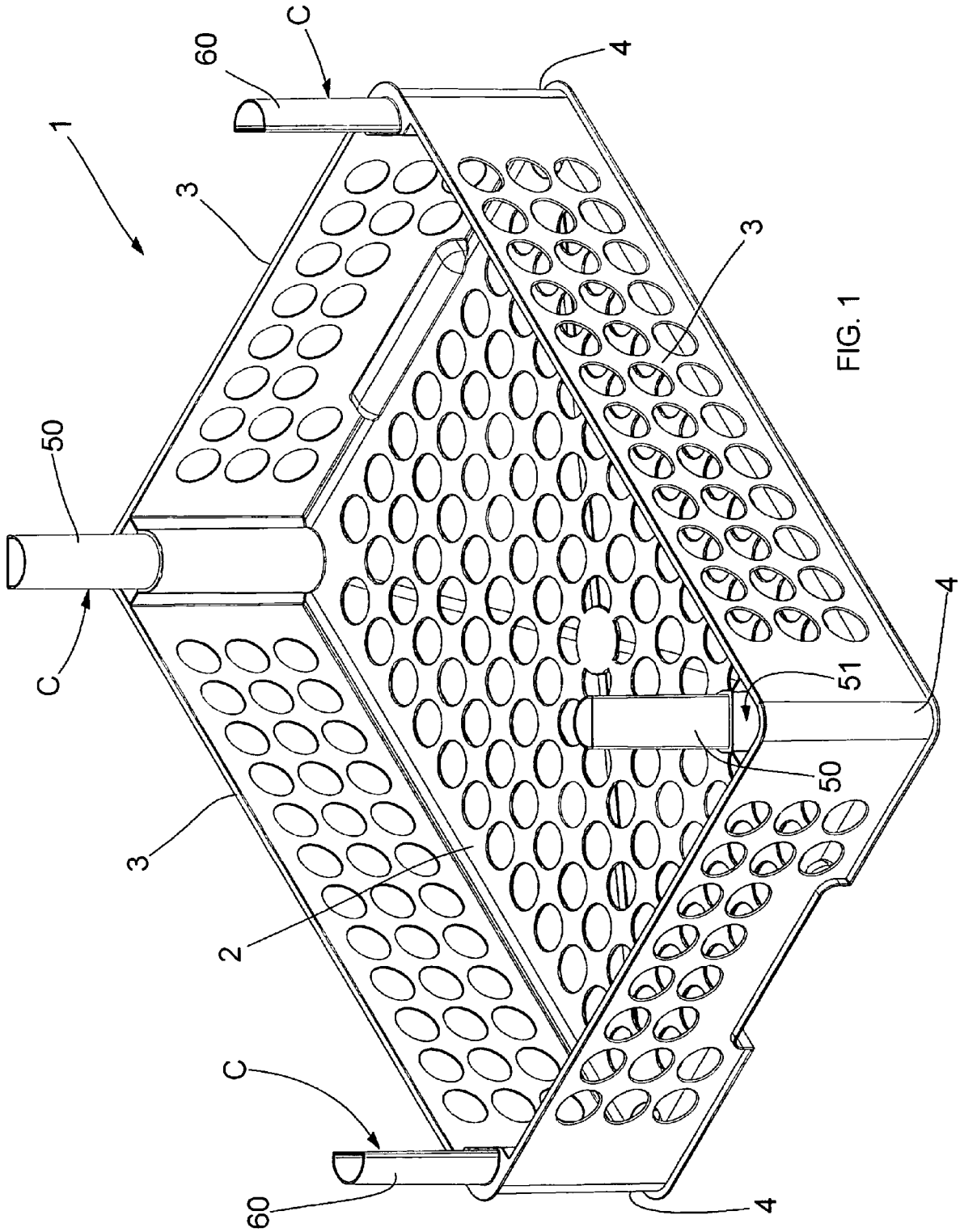

FIG. 1

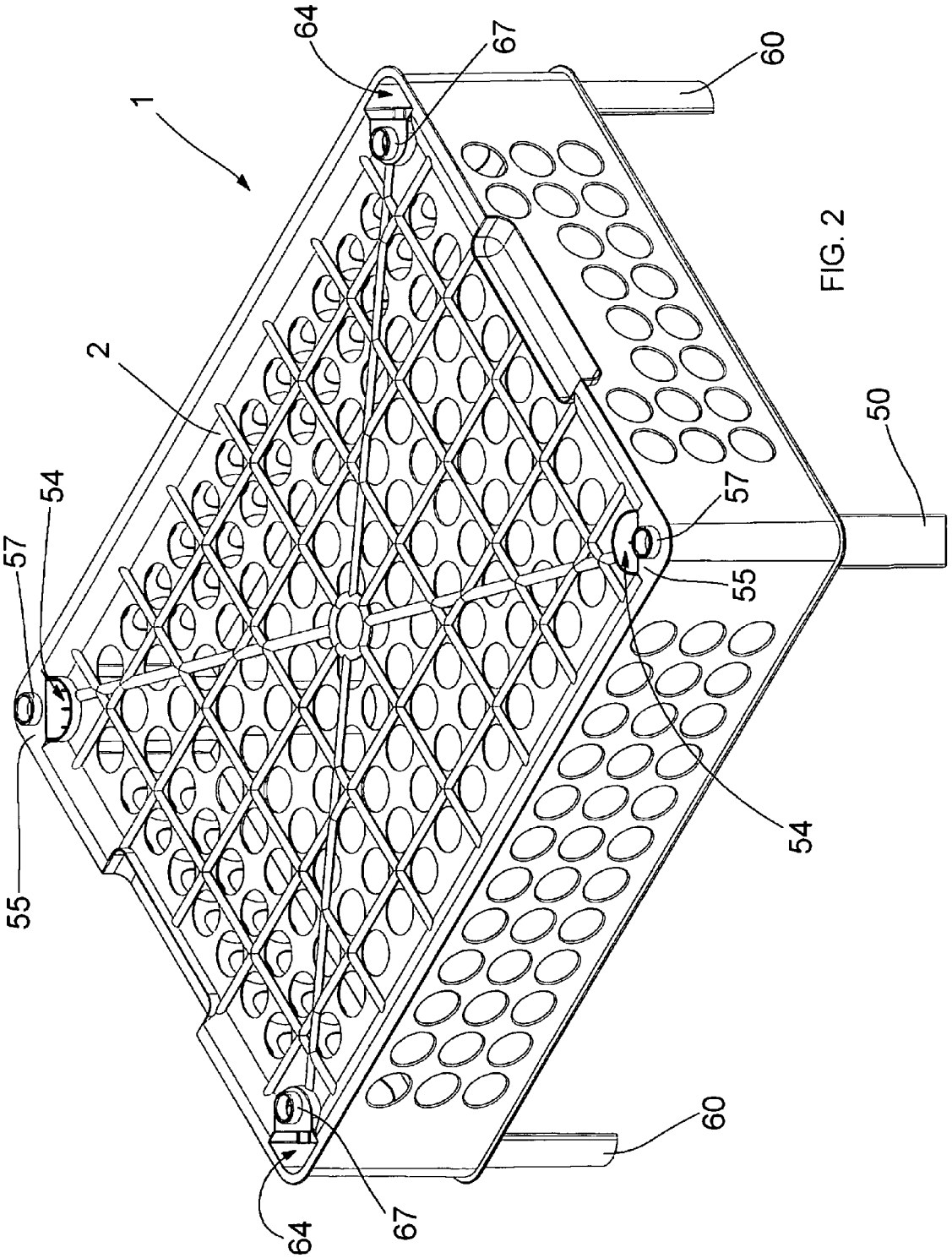

FIG. 2

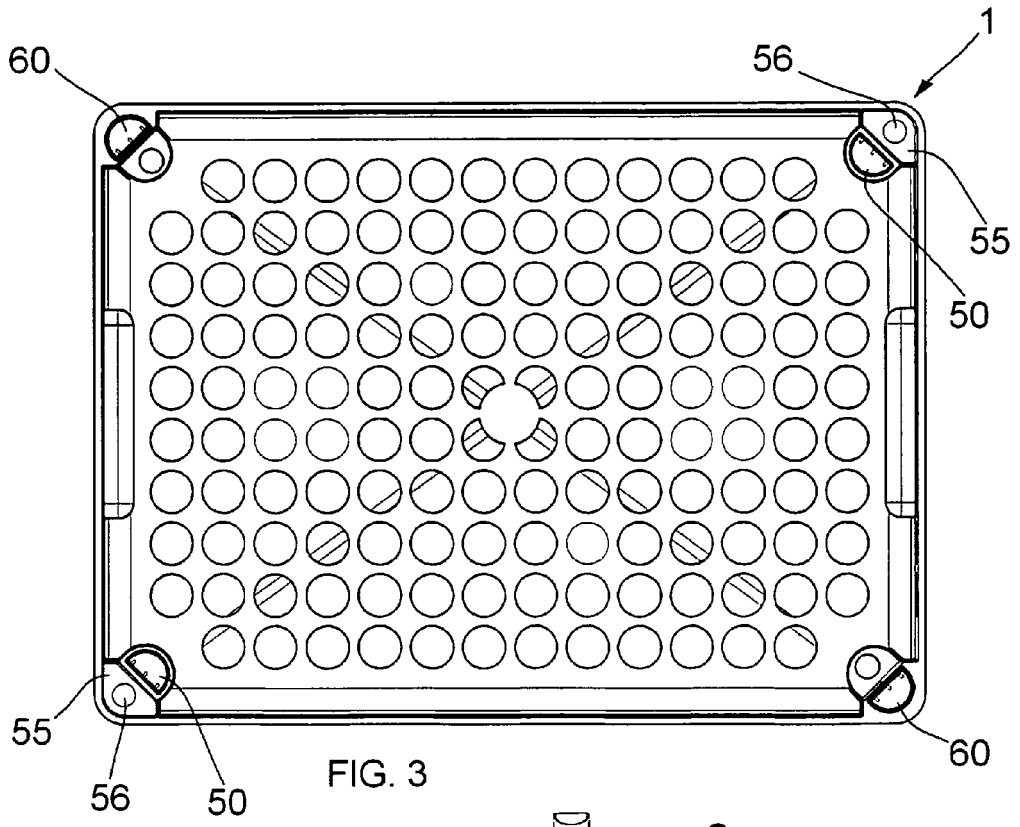

FIG. 3

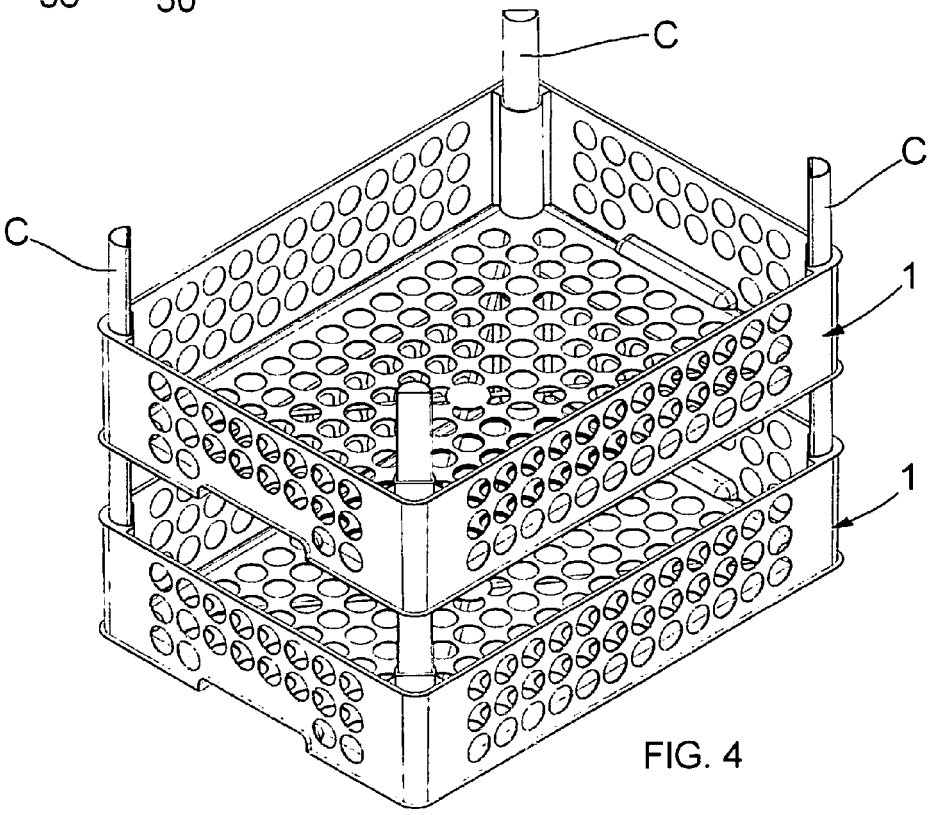

FIG. 4

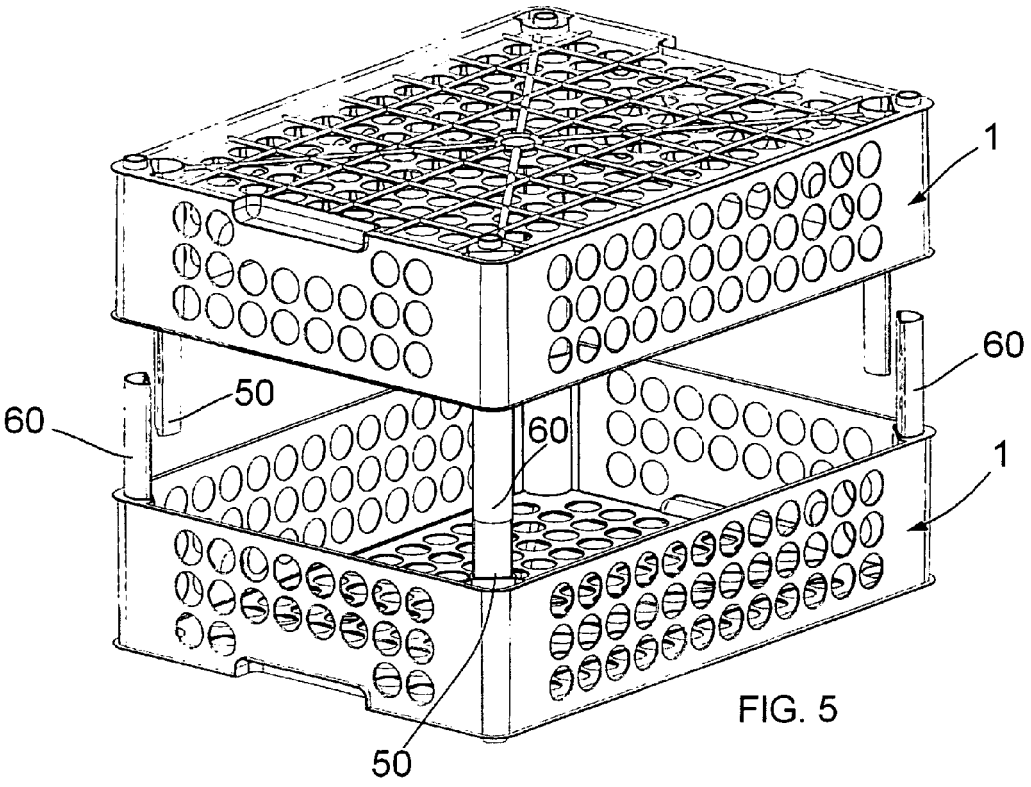

FIG. 5

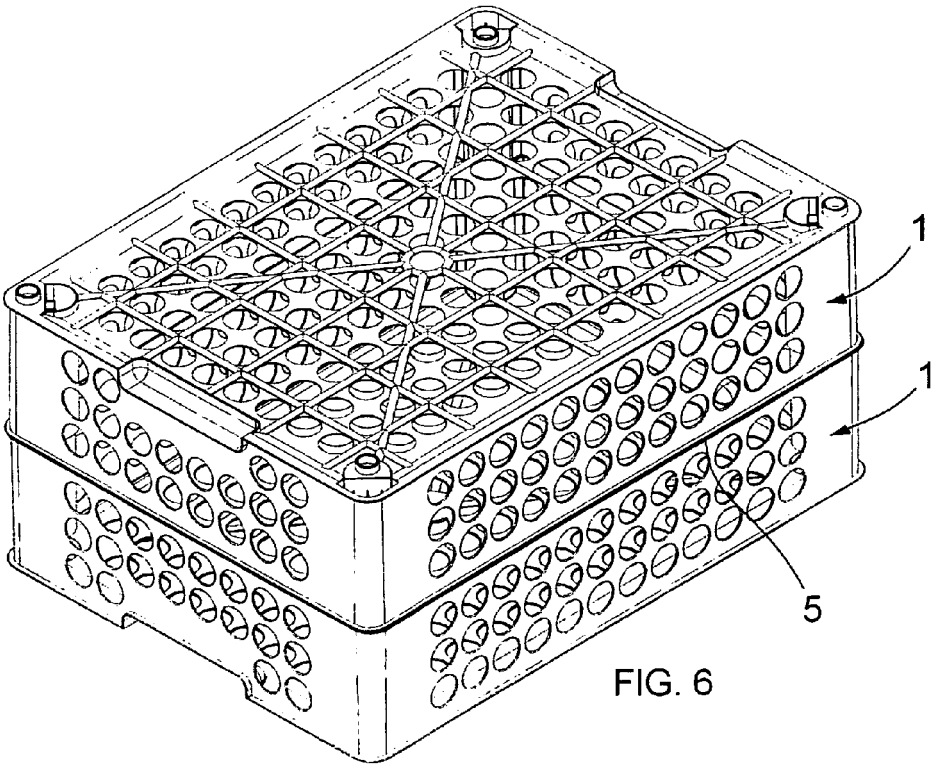

FIG. 6

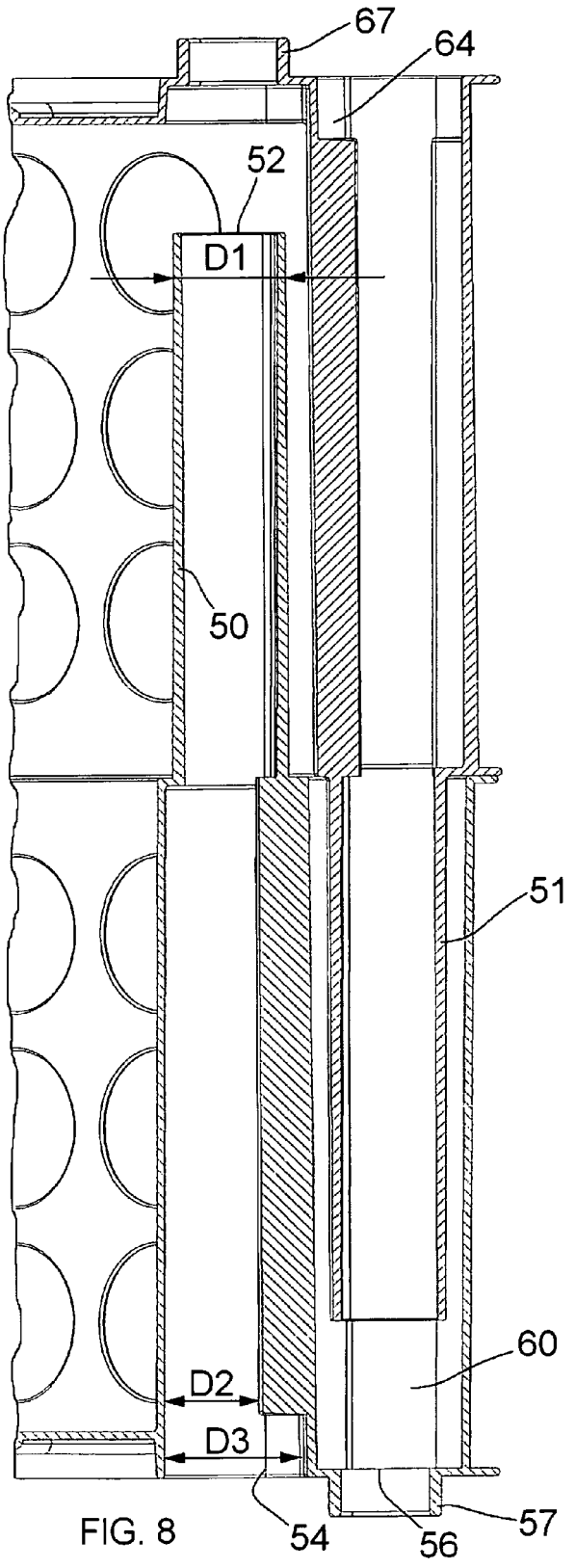

FIG. 8

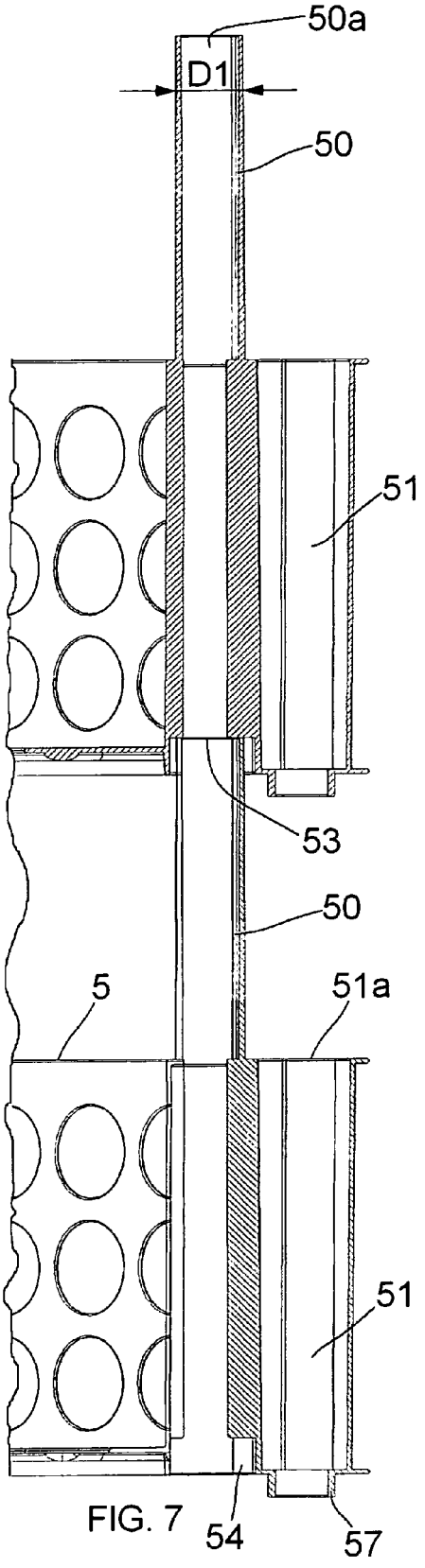

FIG. 7

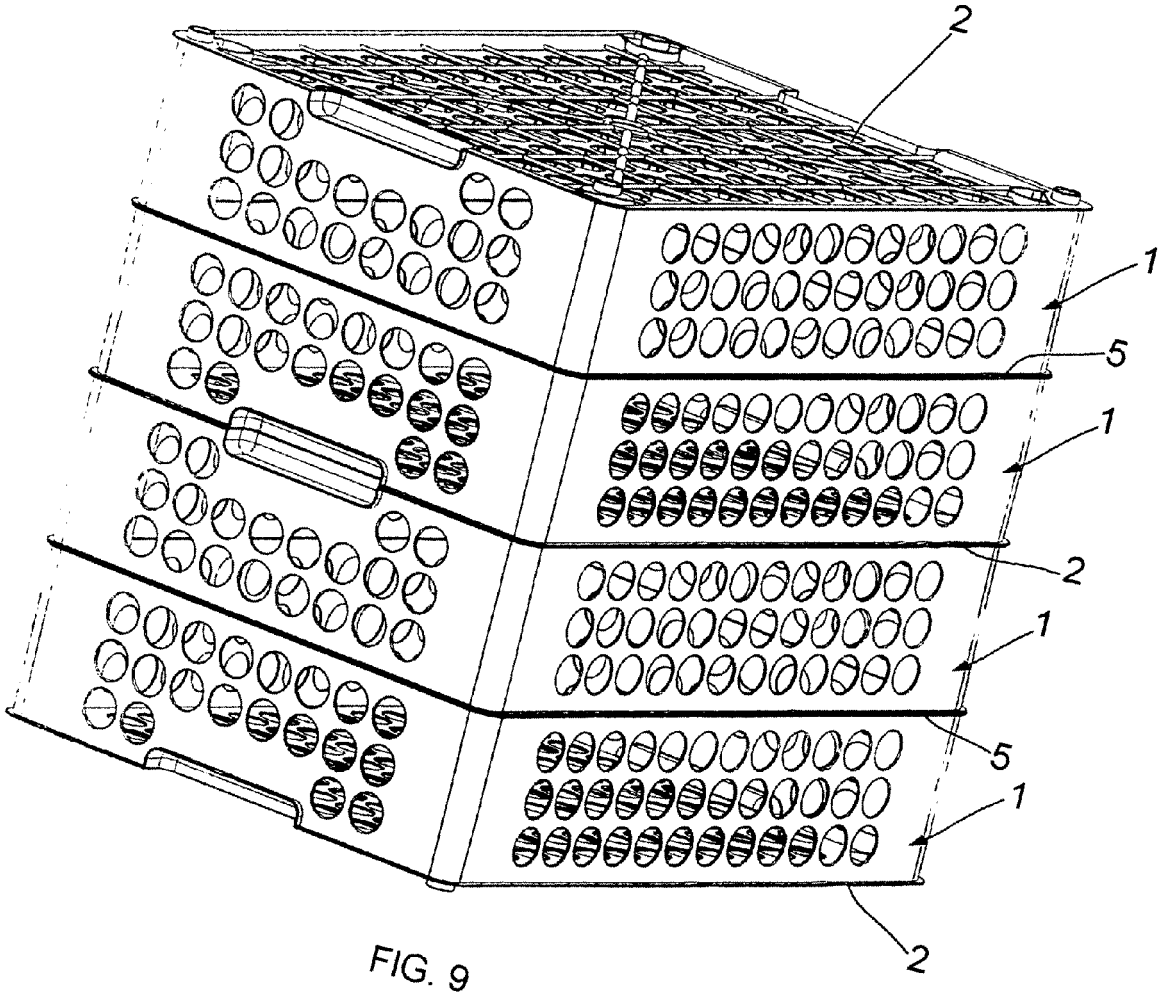

FIG. 9

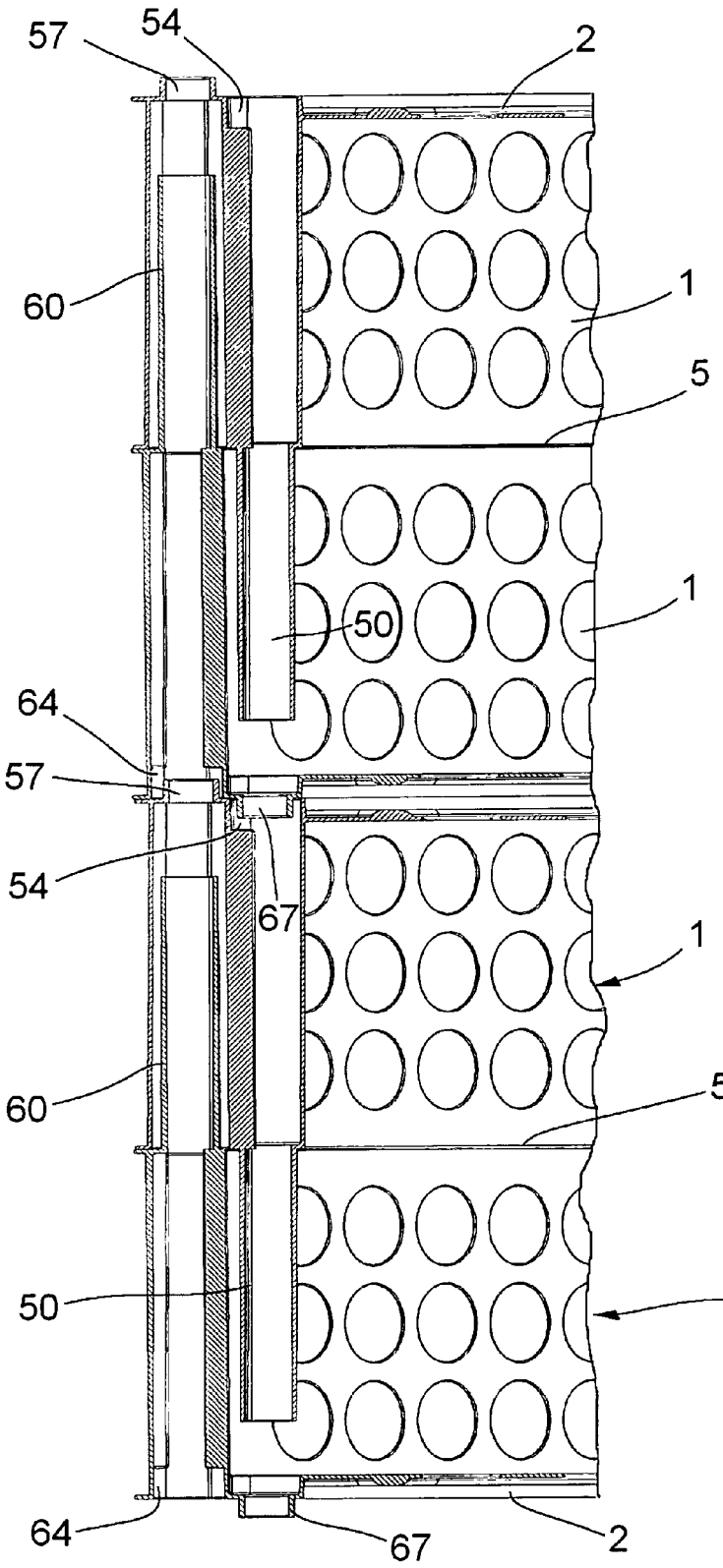

FIG. 10

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 11 42 5033

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 092 888 A1 (CURVER BV [NL]) 2 November 1983 (1983-11-02) * page 3, line 11 - page 4, line 4; figure 14 *	1-9	INV. B65D21/02
A	DE 27 21 129 A1 (DELBROUCK FRANZ GMBH) 16 November 1978 (1978-11-16) * figures *	1	
A	EP 1 837 284 A1 (FAVA GIORGIO AXEL S R L [IT]) 26 September 2007 (2007-09-26) * figures *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 May 2011	Fournier, Jacques

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 11 42 5033

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.

19-05-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0092888 A1	02-11-1983	DE 3370310 D1	23-04-1987
		NL 8202095 A	16-11-1983
DE 2721129 A1	16-11-1978	DE 2714623 A1	12-10-1978
EP 1837284 A1	26-09-2007	NONE	