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(71) Applicant: **Pinckney Molded Plastics, Inc.
Howell MI 48855 (US)**

(72) Inventors:
• **Verna, Donald
Wixom,
Michigan 48393 (US)**
• **Kruyer, Richard C.
Swartz Creek,
Michigan 48473 (US)**

(74) Representative: **Ostertag, Ulrich et al
Ostertag & Partner
Patentanwälte
Epplestr. 14
70597 Stuttgart (DE)**

(54) Three-way tray

(57) A tray (10) for providing at least three levels of stacking between vertically adjacent trays includes a tray having four walls (12,14,16,18), a bottom (20), and an adjustment member (22). The adjustment member can be a pin. The tray includes multiple grooves, multiple extensions, multiple recesses, and multiple projections for engagement with another vertically adjacent stacked

tray. The adjustment member in combination with the multiple grooves, multiple extensions, multiple recesses, and multiple projections define a first stacking level, a second stacking level, and a third stacking level, which is intermediate to the first stacking level and the second stacking level. An additional stacking level is defined when vertically adjacent stacked trays are rotated 90° with respect to each other.

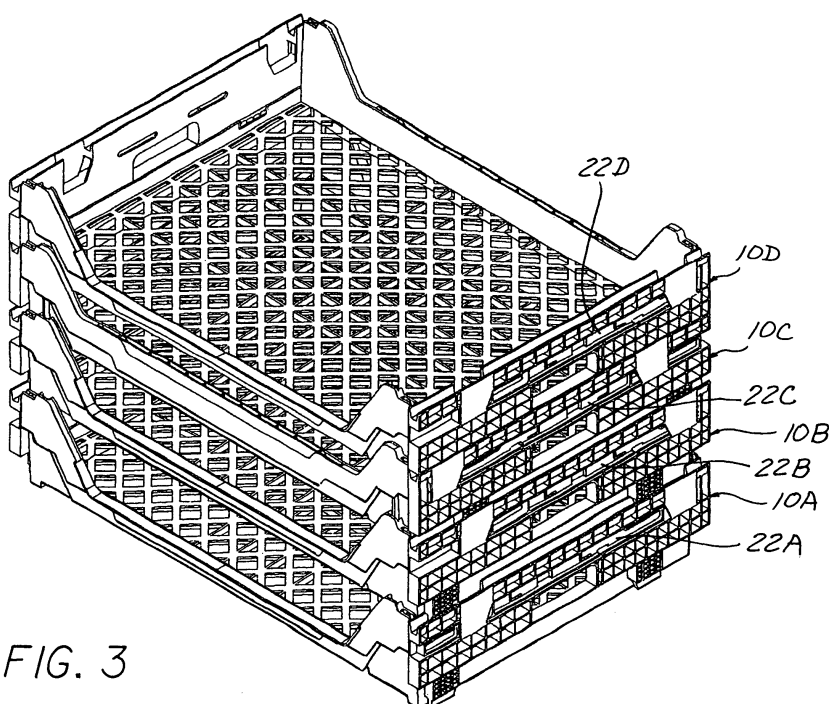


FIG. 3

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of provisional patent application serial number 60/615,807 filed on October 4, 2004, and provisional patent application serial number (awaiting reporting from United States Patent Office) filed on February 23, 2005, which are incorporated by reference herein in its entirety.

FIELD OF THE INVENTION

[0002] This invention relates generally to containers and more particularly to bakery trays or baskets, which can be vertically stacked or nested.

BACKGROUND

[0003] Stackable and nestable tray-like containers are available in various sizes and designs. In general, these tray-like containers are most widely used in the bakery industry for transporting mass quantities of baked goods such as bread loaves and buns. Generally stacking and nesting containers are known in the art. Typically the trays can be stacked on top of each other and nested within each other. The prior art discloses a number of ways this can be accomplished, including stacking with and without an aligning means and nesting of trays when aligned relative with one another and when rotated 180° relative to one another. Such trays are desirable for their ability to stack when loaded for maximum packing and their ability to nest when empty for minimal use of storage space. A three position tray allows the trays to be positioned between a stacking and nesting position for the loading of goods with a lower height. The trays allow the use of a single tray design for differing product sizes, while efficiently utilizing available space.

[0004] Incorporated by reference U.S. Patent No. 6,394,274.

SUMMARY

[0005] The present invention is a three-way tray or container that provides at least three levels of stacking between vertically adjacent stacked trays. The tray includes a first wall, a second wall located opposite from the first wall, a first side wall, a second side wall located opposite from the first side wall, a bottom connectible between the four walls, and means for adjustably stacking vertically adjacent containers. The adjustably stacking means can include, a plurality of complementary extensions and grooves, a plurality of complementary protrusions and recesses, and at least one adjustment member.

[0006] The adjustably stacking means can comprise a first stacking level defined when vertically adjacent stacked trays are in an identical orientation with respect to one another and a plurality of protrusions of one tray

are received by a plurality of grooves of another tray, a second stacking level defined when one tray is rotated one-hundred eighty degrees (180°) with respect to another vertically adjacent stacked tray, an at least one adjustment member of the one tray is in a disengaged position, and a plurality of extensions of the another tray are fully received by a plurality of recesses of the one tray, and a third stacking level intermediate with respect to the first stacking level and the second stacking level and defined when one tray is rotated one-hundred eighty degrees (180°) with respect to another vertically adjacent stacked tray, the at least one adjustment member of the one tray is in an engaged position, and the extensions of another tray are partially received by the recesses of the one tray to a depth limited by the at least one adjustment member.

[0007] The at least one adjustment member can be a pin receivable by a channel of at least one of the first side wall and the second side wall. The pin can include detent means for defining a plurality of stop positions relative to the channel.

[0008] Other applications of the present invention will become apparent to those skilled in the art when the following description of the best mode contemplated for practicing the invention is read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The description herein makes reference to the accompanying drawings wherein like reference numerals refer to like parts throughout the several views, and wherein:

[0010] Fig. 1 is a perspective view of a tray according to the present invention;

[0011] Fig. 2 a perspective view of a side of the tray;

[0012] Fig. 3 is a perspective view of multiple vertically adjacent stacked trays;

[0013] Fig. 4 is a side elevational view of multiple stacked trays;

[0014] Fig. 5 is a front elevational view of multiple stacked trays;

[0015] Fig. 6 is a front perspective view of an adjustment member of the tray; and

[0016] Fig. 7 is a rear perspective view of the adjustment member.

DETAILED DESCRIPTION

[0017] Referring to the drawings, a container or tray 10 is shown in Figs. 1-7. The tray 10 has four vertical walls including a first wall 12, a first side wall 14, a second wall 16, and a second side wall 18, and has a lower planar surface or bottom 20 connected between the four walls 12-18. The first side wall 14 and the second side wall 18 are mirror images of each other and, therefore, only one side will be discussed.

[0018] As best seen in Fig. 3-5, multiple trays 10A-10D

can be stacked such that an operator can select between multiple stacking levels between each pair of vertically adjacent trays 10A-10D. The stacking levels are each associated with a relative distance between the bottoms 20 of each pair of adjacent trays 10. When the top tray 10A is oriented in a stacked position such that the first wall 12 of the tray 10B is facing in the same direction as the first wall 12 of the tray 10A, then the distance between the bottoms 20 will be at one level. When the tray 10D is oriented in a reversed manner with respect to the tray 10C such that the second wall 16 of the tray 10D is facing in the same direction as the first wall 12 of the tray 10C and the pin 22C is in a retracted position, then the distance between the bottoms 20 of the trays 10A-B will be at a different level. Additionally, if the tray 10C has a reversed orientation with respect to the bottom tray 10B and the pin 22B is in an engaged position, the distance between the bottoms 20 will be at a middle or intermediate level as compared to the two distances described above. Thus, the invention provides for at least three levels of stacking.

[0019] Referring again to Figs. 1-5, the bottom 20 can include a plurality of apertures 24 to allow ventilation between the trays 10. By way of example and not limitation, the apertures 24 can be arranged in at least one of a grid pattern, a honeycomb pattern, and a parallel slotted pattern.

[0020] In a preferred configuration, the first wall 12 and the second wall 16 have lower heights relative to the first side wall 14 and the second side wall 18. The first wall 12 can include an angular step portion 26 proximate to each corner 28 with a lower ledge 30 therebetween. The second wall 16 can include an angular step portion 31 proximate to each of the corners 28. On an upper surface 32 of each of the angular portions 26, 31 of the first wall 12 and the second wall 16, respectively, and adjacent to the side walls 14, 18 is a first notch 34 and a first rail lip portion 36, which commences a non-continuous inner rail 38 for guidance along the side walls 14, 18 when stacking one tray 10 vertically adjacent to another tray 10. Adjacent to the first rail lips 36 and inboard from the side walls 14, 18 is a second notch 40. Each second notch 40 is sized to accommodate one of the side walls 14, 18 when one tray 10 is stacked vertically adjacent to and positioned rotated (90°) ninety degrees relative to another tray 10 for storage of the unloaded trays 10.

[0021] As discussed above, the first side wall 14 and the second side wall 18 are mirror images of each other. An upper continuous wall portion extends the entire length of the side walls 14, 18, herein referred to as the outer rail 42. A groove 44 extends between the inner rail 38 and the outer rail 42. The first wall 14 includes multiple extensions or feet 46. The feet 46 can have non-uniform spacing with respect to the length of the first side wall 14. The foot proximate to the first wall 12 is referred to as 46A, and the foot proximate to the second wall 16 is referred to as 46B. Each foot 46A, 46B is generally rectangular in shape and can include at least one angled

corner or chamfer 47A, 47B. At the bottom of each foot 46A, 46B, there is a protrusion 48A, 48B respectively, where the protrusions 48A, 48B have a complementary shape and a complementary spacing with respect to the groove 44. The side walls 14, 18 each can include multiple recesses 50A, 50B. The recesses 50A, 50B can have a complementary shape to the feet 46A, 46B, respectively. The number of the recesses 50A, 50B and spacing of the recesses 50A, 50B along the first side wall 14 are complementary to the number and spacing of the feet 46A, 46B, respectively. The first side wall 14 can include at least one window or aperture 52 in order to allow at least one of gripping the tray 10 by an operator and viewing of items or merchandise contained in the tray 10. The aperture 52 can be generally rectangular in shape and can include rounded corners 54.

[0022] The first side wall 14 can include a channel 56 for receiving the pin 22, as can be seen in Figs. 1-5. The channel 56 can intersect the recesses 50A, 50B and can be positioned between the aperture 52 and the rail 42. The channel 56 can include retaining means 58 for retaining the pin 22 in the channel 56. By way of example and not limitation, the retaining means 58 can include at least one aperture 60 for receiving at least one retaining member 62 of the pin 22. The aperture 60 can be a longitudinally extending slot.

[0023] As shown in Figs. 6 and 7, the pin 22 can include multiple steps 64. The pin 22 can include a first end 66 and a second end 68. The at least one retaining member 62 can be generally cylindrical in shape. A first step 70 is located proximate to the first end 66 and is equal in height to a second step 72, which is located proximate to the second end 68. A corner 74 can be chamfered and is located between the first step 70 and an upper portion 76. A notch 78 is located between the upper portion 76 and the second step 72 and is lower in height than the second step 72. The length of the pin 22 is shorter than the length of the channel 56 allowing movement of the pin 22 within the channel 56. The first end 66 of the pin 22 is inserted into the channel 56 first. The distance from the second end 68 of the pin 22 to the notch 78 is equal to the distance between the first end 66 to the corner 74. The shape of the corner 74 can be complementary to the angled corners 47A, 47B of the feet 46A, 46B, respectively. The pin 22 can include detent means for defining a plurality of stop positions 80A, 80B of the pin 22 relative to the channel 56. The detent means can be a detent member 82 for engaging one of a plurality of detent apertures 84A, 84B of the channel 56 where each detent aperture corresponds to a stop position 80A, 80B.

[0024] Referring again to Figs. 3-5, there is shown a first stacking level, which is defined when the tray 10B is in the same orientation as the tray 10A. When the first level of stacking is selected, the protrusions 48 of the feet 46 are received by the groove 44 of the tray 10A. This results in a maximum distance between the bottoms 20 of the trays 10A, 10B relative to other stacking levels described herein.

[0025] A second stacking level is shown where the tray 10D is in a reversed or 180° orientation with respect to the tray 10C where the second wall 16 of the tray 10D faces the same direction of the first wall 12 of the tray 10C, and the pin 22C of the tray 10C is in a first position where the detent member 82 is engaged with the detent aperture 84B. When in this stacking level, the feet 46 of the tray 10D are received in their entirety by the recesses 50 of the tray 10C. This results in a minimum distance between the bottoms 20 of the trays 10C, 10D relative to other stacking levels discussed herein.

[0026] A third stacking level is defined, as discussed above, when the tray 10C is in the reversed or 180° orientation relative to the tray 10B, and the pin 22B of tray 10B is in a second position where the detent member 82 is engaged with the detent aperture 84A. When the pin 22B is in the second position, it is moved relative to the channel such that the steps 70, 72 of the pin 22B of the tray 10B are in a corresponding location to the recesses 50 of the tray 10B. This limits the depth of the recesses 50 so that when the tray 10C is stacked vertically onto the tray 10B the feet 46 of the top tray 10C rest on the steps 72, 70 of the pin 22B and are only partially received by the recesses 50 of the tray 10B. This results in a middle or intermediate distance between the bottoms 20 of the trays 10B, 10C relative to the first stacking level and the second stacking level described above.

[0027] While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not to be limited to the disclosed embodiments but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims, which scope is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures as is permitted under the law.

Claims

1. A tray for vertically stacking a plurality of identical trays and providing at least three levels of stacking between two vertically adjacent stacked trays comprising:

a first wall;
a second wall located opposite from the front wall;
a first side wall;
a second side wall located opposite from the first side wall;
a bottom connectible between the four walls;
and
means for adjustably stacking vertically adjacent containers.

2. The tray of claim 1 further comprising at least one

aperture associated with each of the first side wall and the second side wall to allow at least one of gripping the tray by an operator and viewing items contained in the tray.

3. The tray of claim 2 wherein the aperture has at least one of a rectangular shape and a plurality of rounded corners.
4. The tray of claim 1 wherein the apparatus is formed of a plastic material.
5. The tray of claim 4 wherein the plastic material further comprises an injection molded plastic.
6. The tray of claim 4 wherein the plastic material further comprises at least one of a virgin plastic material, a reprocessed plastic material, and any mixture thereof.
7. The tray of claim 1 wherein the bottom is integrally formed with the first wall, the second wall, the first side wall, and the second side wall.
8. The apparatus of claim 1 wherein the second side wall is a mirror image of the first side wall.
9. The tray of claim 1 wherein the bottom further comprises a plurality of apertures.
10. The tray of claim 9 wherein the plurality of apertures are arranged in at least one of a grid pattern, a honeycomb pattern, and a parallel slotted pattern.
11. The tray of claim 1 wherein the adjustably stacking means further comprises:

a plurality of grooves located proximate to a top edge of the first side wall and the second side wall and having a continuous outer ledge and a discontinuous inner ledge spaced from and oriented parallel to the outer ledge to form each groove;
a plurality of recesses located proximate to the top edge of the first side wall and the second side wall;
a plurality of extensions located proximate to a bottom edge of the first side wall and the second side wall and having a corresponding shape, a corresponding location, and a corresponding number to the plurality of recesses and each extension including a protrusion having a complementary shape to the groove and located proximate to the bottom edge;
at least one adjustment member associated with at least one of the first side wall and the second side wall and having a plurality of steps located along a top edge of the adjustment member and

- corresponding to a plurality of stacking levels and;
 at least one channel formed in at least one of the first side wall and the second side wall for receiving the at least one adjustment member and located proximate to the plurality of recesses.
12. The tray of claim 11 wherein the plurality of recesses further comprise a plurality of recesses non-uniformly spaced along the top edge of each side wall.
13. The tray of claim 11 wherein the at least one adjustment member further comprises a slidable pin.
14. The tray of claim 11 wherein the at least one adjustment member further comprises detent means for defining a plurality of stop positions for the adjustment member.
15. The tray of claim 11 wherein the at least one adjustment member further comprises means for retaining the adjustment member relative to the at least one channel.
16. The tray of claim 15 wherein the retaining means further comprises at least one retaining member of the at least one adjustment member receivable by at least one aperture of at least one of the first side wall and the second side wall proximate to the at least one channel.
17. The tray of claim 1 wherein the adjustable stacking means further comprises:
- a first stacking level defined when the vertically adjacent stacked trays are in an identical orientation with respect to one another and a plurality of protrusions of one tray are received by a plurality of complementary grooves of another tray;
 - a second stacking level defined when one tray is rotated one-hundred eighty degrees (180°) with respect to another vertically adjacent stacked tray, an at least one adjustment member of the one tray is in a first position, and a plurality of protrusions of the another tray are fully received by a plurality of recesses of the one tray; and
 - a third stacking level intermediate with respect to the first stacking level and the second stacking level and defined when one tray is rotated one-hundred eighty degrees (180°) with respect to another vertically adjacent stacked tray, the at least one adjustment member of the one tray is in a second position, and the extensions of another tray are partially received by the complementary recesses of the one tray to a depth limited by the at least one adjustment member.
18. The apparatus of claim 1 wherein the adjustable stacking means further comprises a stacking level defined when one container is rotated ninety degrees (90°) with respect to another vertically adjacent stacked container, and the first side wall and the second side wall of the one container is received by at least one complementary notch of the first wall and the second wall of the tray.
19. A container for stacking a plurality of identical containers and providing at least three levels of stacking between two vertically adjacent stacked containers comprising:
- a first wall;
 - a second wall located opposite from the front wall;
 - a first side wall;
 - a second side wall located opposite from the first side wall;
 - a bottom connectible between the four walls; and
 - means for adjustably stacking vertically adjacent containers comprising a first stacking level defined when the vertically adjacent stacked containers are in an identical orientation with respect to one another and a plurality of protrusions of one container are received by a plurality of grooves of another container, a second stacking level defined when one container is rotated one-hundred eighty degrees (180°) with respect to another vertically adjacent stacked container, an at least one adjustment member of the one container is in a first position, and a plurality of extensions of the another container are fully received by a plurality of recesses of the one container, and a third stacking level intermediate with respect to the first stacking level and the second stacking level and defined when one container is rotated one-hundred eighty degrees (180°) with respect to another vertically adjacent stacked container, the at least one adjustment member of the one container is in a second position, and the extensions of another container are partially received by the recesses of the one container to a depth limited by the at least one adjustment member.
20. The container of claim 19 further comprising at least one aperture associated with each of the first side wall and the second side wall to allow at least one of gripping the container by an operator and viewing items contained in the container.

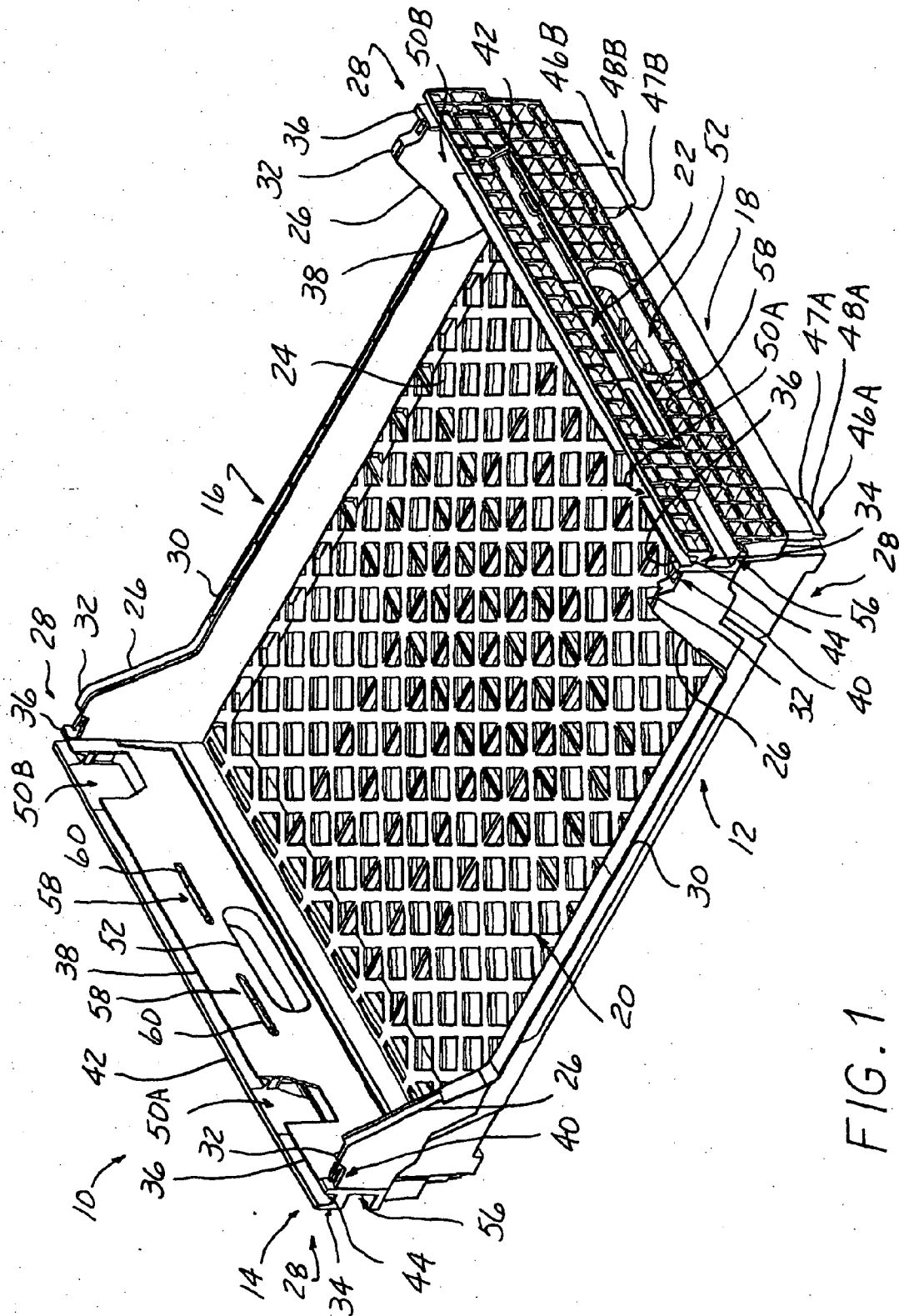


FIG. 1

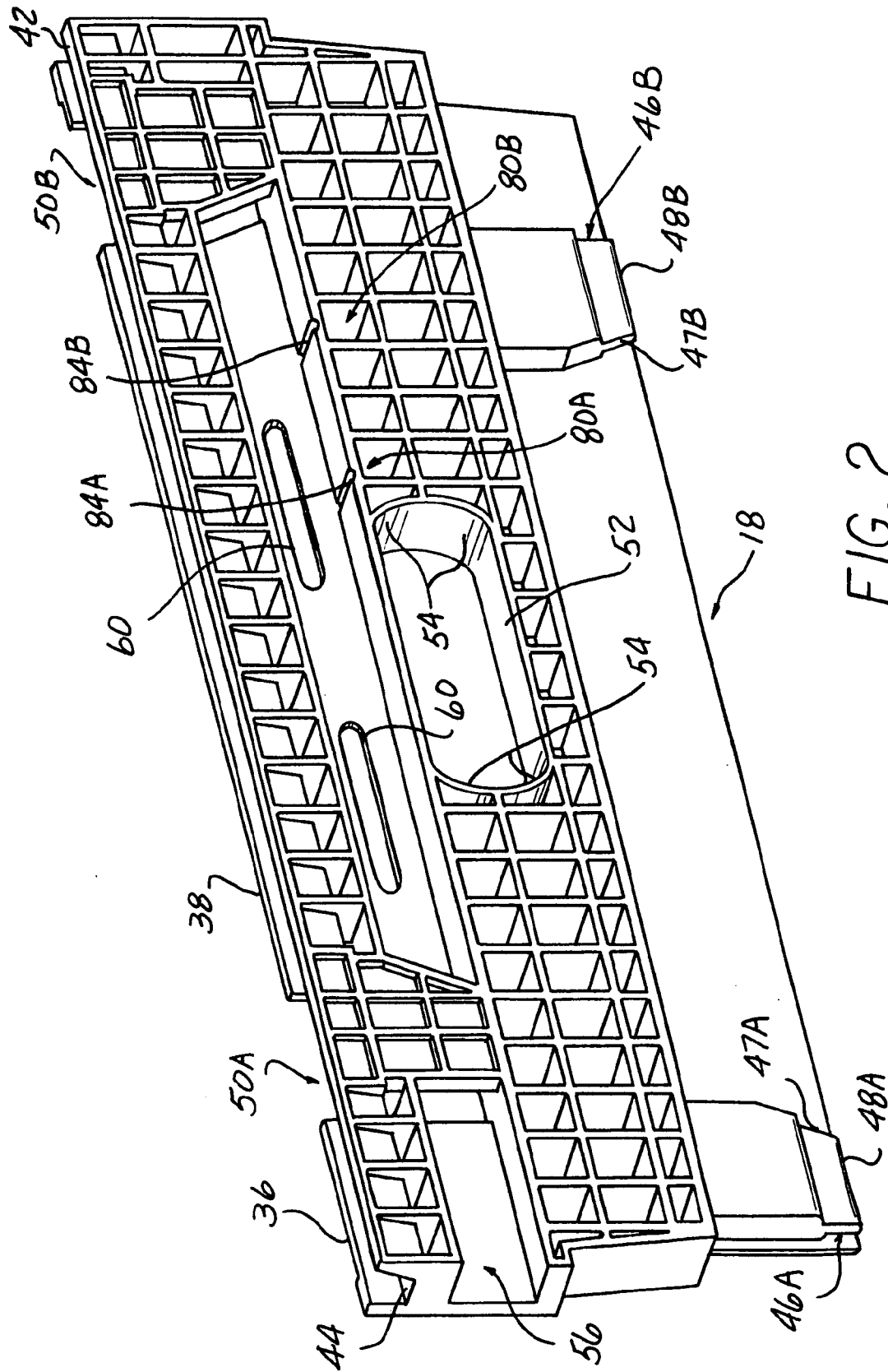


FIG. 2

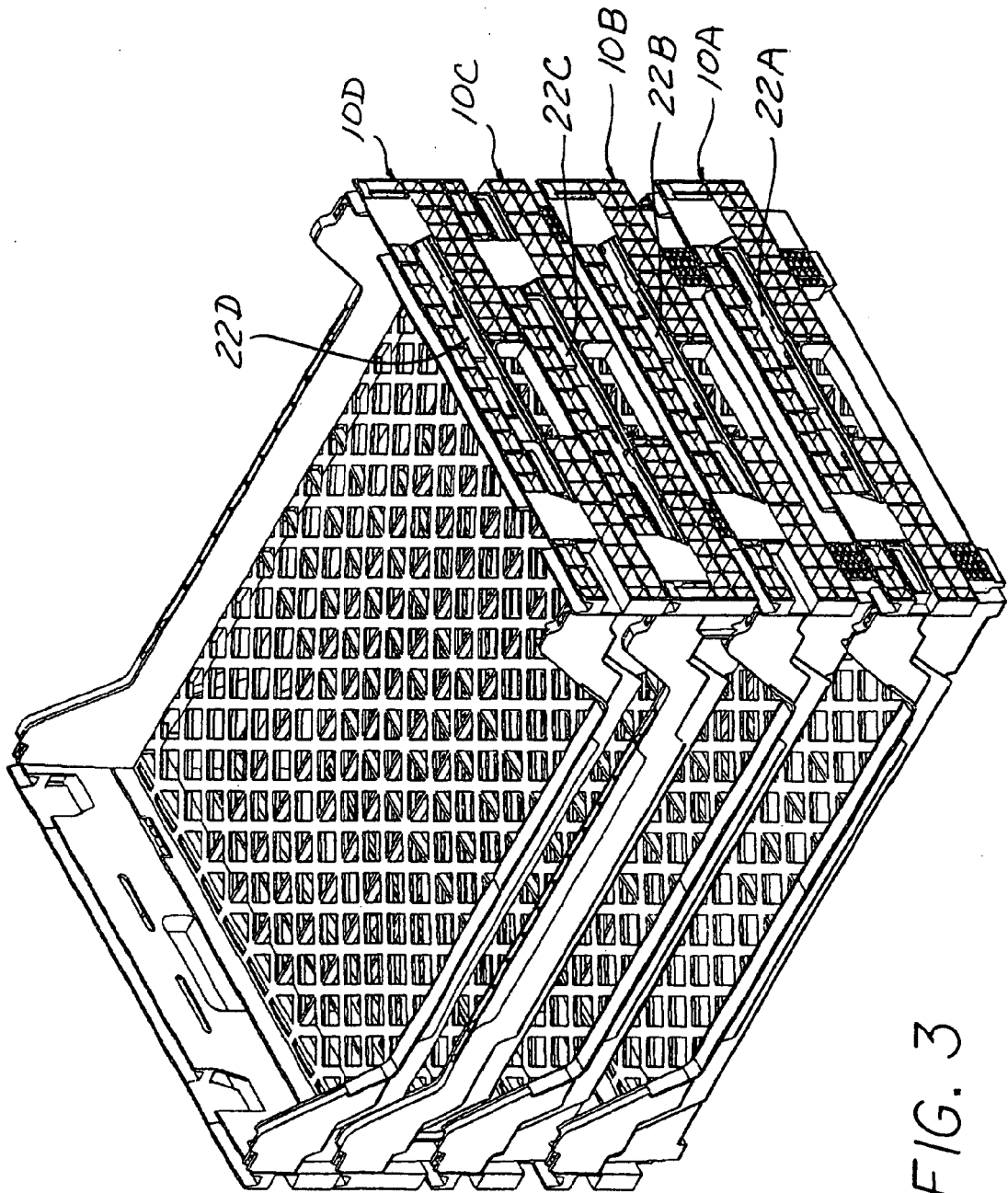


FIG. 3

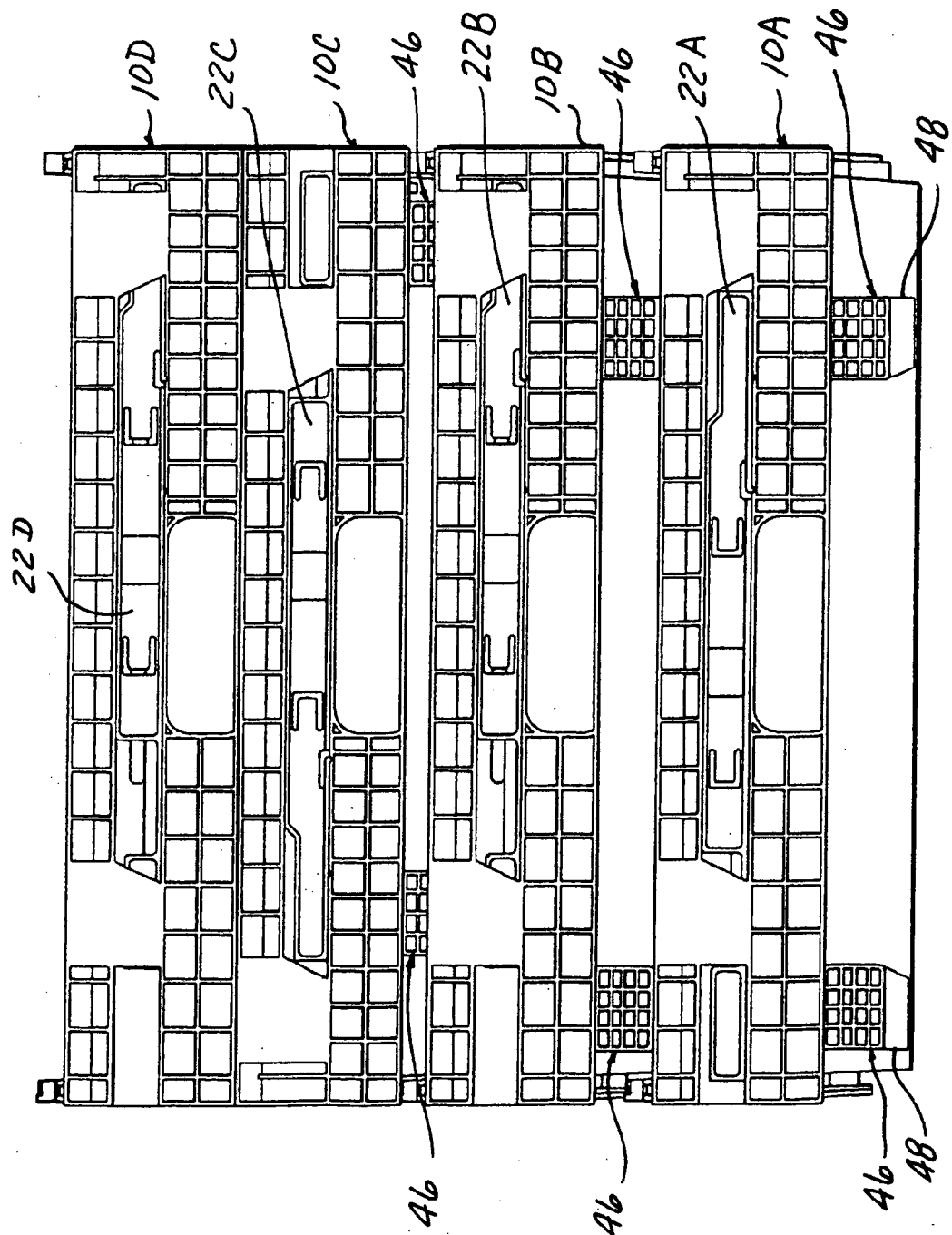


FIG. 4

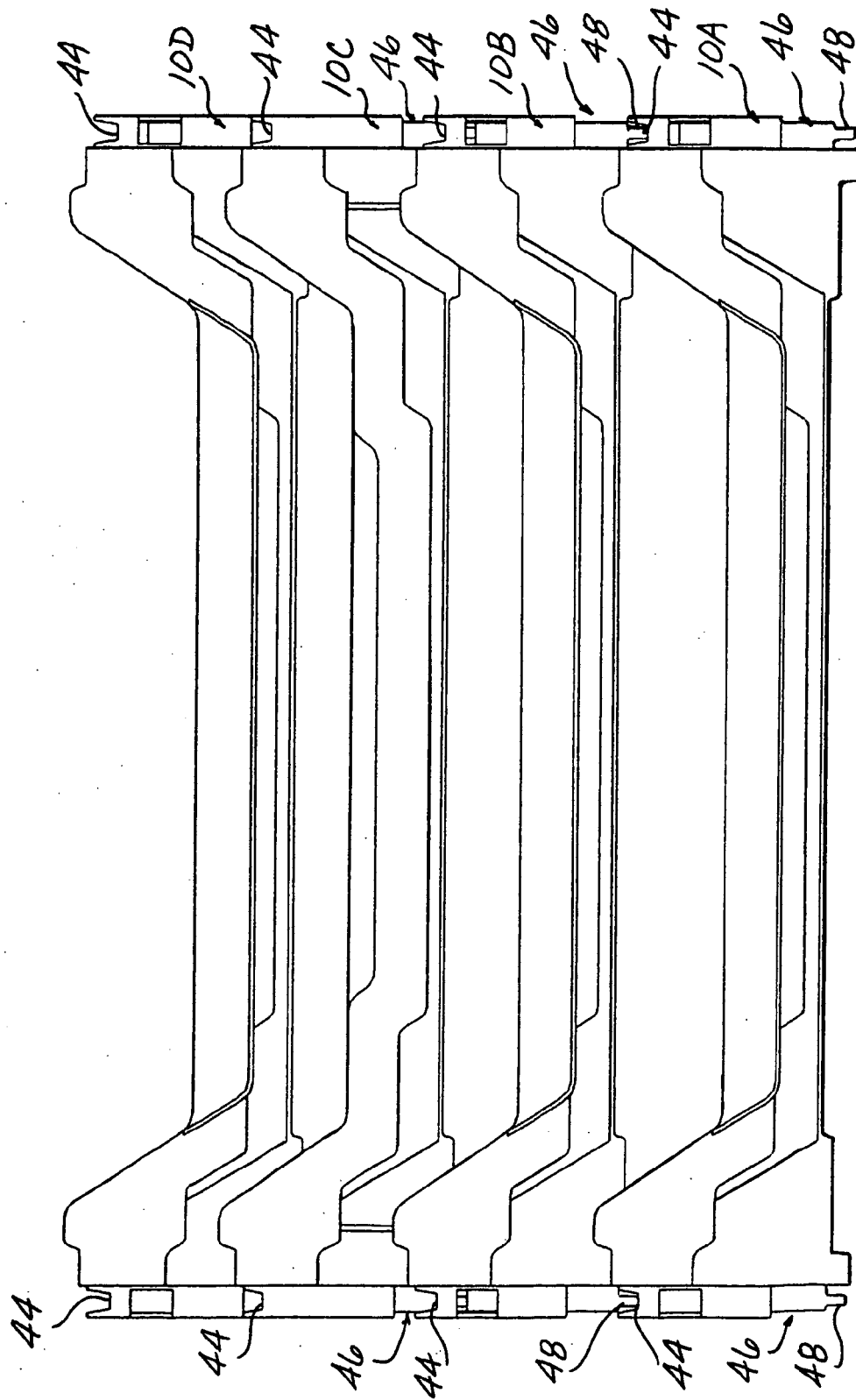


FIG. 5

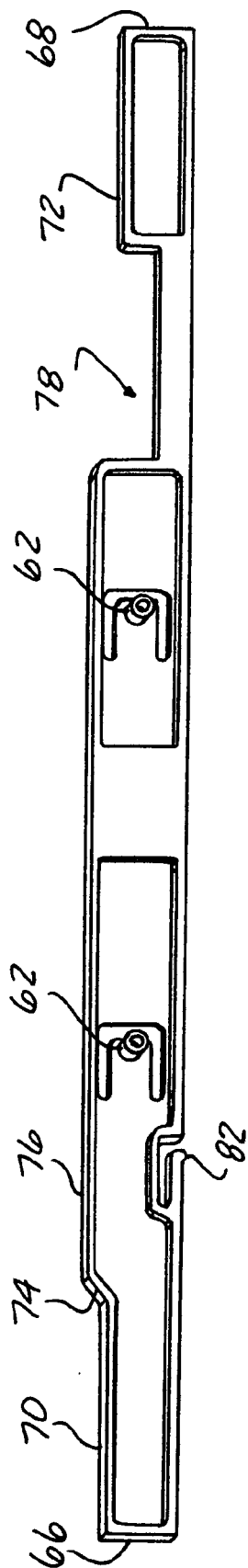


FIG. 6

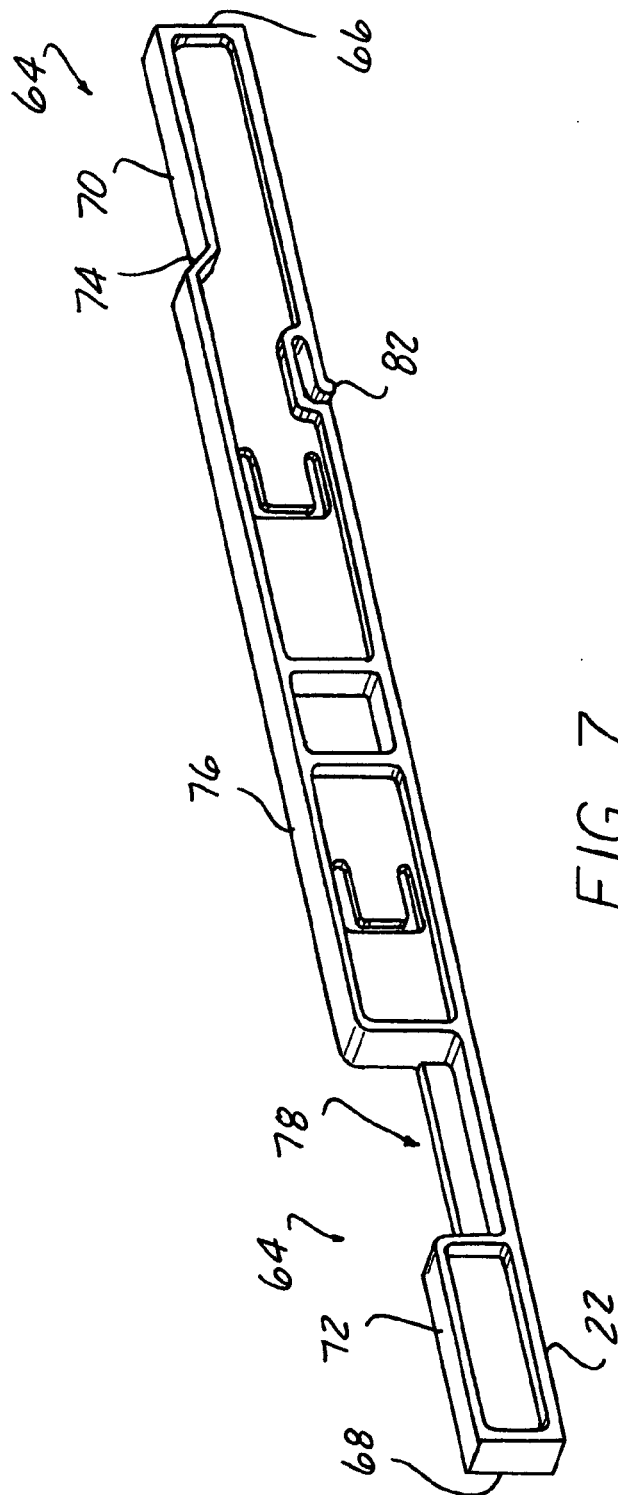


FIG. 7



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 05 02 0745

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	US 4 423 813 A (KREEGER ET AL) 3 January 1984 (1984-01-03) * column 2, line 41 - column 3, line 11 * * column 4, line 17 - line 54; claims 1-6; figures 1-9 *	1,4,5,7, 9,10,17, 19	B65D21/04
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X	US 3 219 232 A (WILSON JAMES D) 23 November 1965 (1965-11-23) * column 2, line 23 - column 3, line 47; claims 1-4; figures 1-3 *	1-10	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 January 2006	Examiner Janosch, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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EPO FORM 1503 03.82 (P04C01)

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

EP 05 02 0745

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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04-01-2006

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