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

(11) EP 2 072 411 A2

# (12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
**24.06.2009 Bulletin 2009/26**

(51) Int Cl.:
***B65D 19/06*** *(2006.01)* ***B65D 88/52*** *(2006.01)*

(21) Application number: **08171937.9**

(22) Date of filing: **17.12.2008**

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

(30) Priority: **17.12.2007 AU 2007906882**

(71) Applicants:
- **Elvin-Jensen, Marc Phillipe**
  **French Forest New South Wales 2086 (AU)**
- **Elvin-Jensen, Gavin Jean**
  **French Forest New South Wales 2086 (AU)**
- **Elvin-Jensen, Justin Thor**
  **French Forest New South Wales 2086 (AU)**

(72) Inventors:
- **Elvin-Jensen, Marc Phillipe**
  **French Forest New South Wales 2086 (AU)**
- **Elvin-Jensen, Gavin Jean**
  **French Forest New South Wales 2086 (AU)**
- **Elvin-Jensen, Justin Thor**
  **French Forest New South Wales 2086 (AU)**

(74) Representative: **McCallum, Graeme David**
**Keltie**
**Fleet Place House**
**2 Fleet Place**
**London**
**EC4M 7ET (GB)**

## (54) A bulk container

(57) The present invention relates to a foldable bulk container (10) including a base (12) and a plurality of walls (14 & 16) surrounding the base (12). In use, the walls (14 & 16) are adapted to fold down over the base (12). At least one of the walls (14 & 16) includes reinforcing means in the form of a first elongate hollow (18). The elongate hollow, in use, is substantially parallel to the base (12).

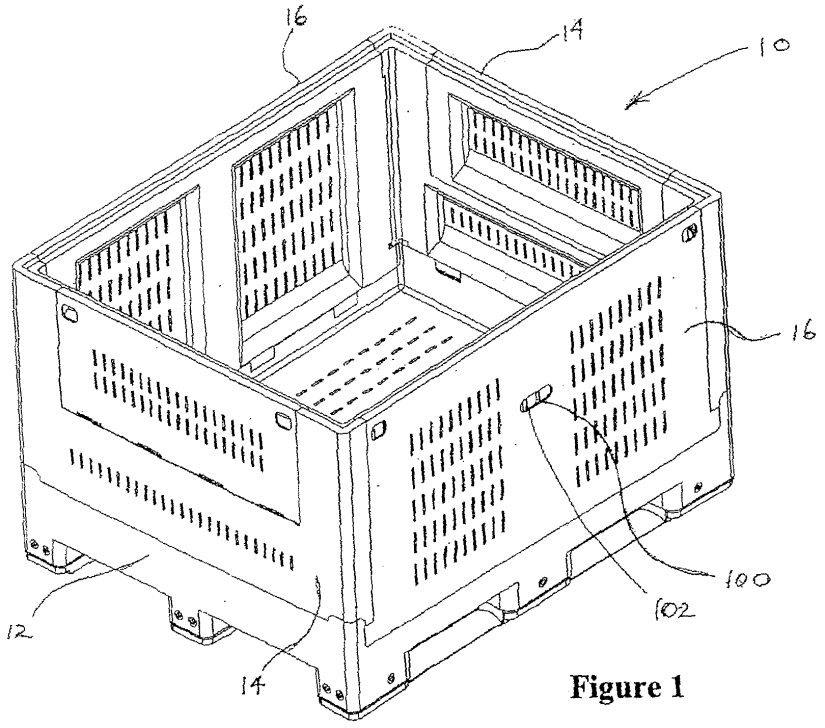



Figure 1

EP 2 072 411 A2

## Description

**[0001]** The present invention relates to a bulk container and relates particularly but not exclusively to a foldable bulk container.

**[0002]** Bulk containers, such as crates for carrying beverage bottles and bins, often have fixed walls with ribs as reinforcing means. It is commonplace for bulk containers having movable or collapsible walls to have the same kind of ribs and even vertical hollow columns as reinforcing means.

**[0003]** While bulk containers with collapsible walls have the advantage of facilitating easy storage, ribs used for reinforcement or strength can be a problem when the container is stored with the walls folded down in that they often create indents or recesses, which provide areas of entrapment where dirt such as leaves and other debris are collected. This typically leads to blockage of drainage holes that may have been provided for draining rain or water, with the further problem that water collects in the indents or recesses, as well as the debris. This problem is of particular concern during and after rainy days when the bulk containers are exposed in the open.

**[0004]** A shortcoming of the bulk containers with collapsible walls described above is that the water and debris almost invariably fall upon the person who erects the collapsible walls or who has to lift the bulk containers for transportation purposes.

**[0005]** According to the present invention there is provided a foldable bulk container including a base and a plurality of walls surrounding the base in use, the walls being adapted to fold down over the base, wherein at least one of the walls includes reinforcing means in the form of a first elongate hollow which, in use, is substantially parallel to the base.

**[0006]** The foldable bulk container of the invention is preferably made similar to that in Australian Patent No. 77173, the contents of which are incorporated herein by reference, except for the elongate hollow and any consequential changes.

**[0007]** Preferably, each wall is pivotally connected to the base to facilitate folding down thereof over the base. More preferably, each wall in use is adapted to engage of the other walls. Even more preferably, each wall has at least one elongate hollow which is adapted to correspond to the elongate hollow of one or more of the other walls so as to maximise rigidity of the bulk container.

**[0008]** The base preferably includes at least two feet. These are preferably located underneath opposing lower edges of the base, but may be located elsewhere. The base may include a third foot located intermediate the two feet.

**[0009]** There are preferably four walls in the container of the invention in a square or rectangular configuration, but it is within the scope of this invention to provide fewer or more walls. More than one of the walls may include one or more of the elongate hollows. The elongate hollow may be mechanically formed by a precision machined horizontally sliding core so as to achieve precise and geometric wall thickness.

**[0010]** The hollow is preferably configured and arranged so that the wall has an outer surface which is substantially flat or planar, to minimise indents and recesses, although it may be desirable to provide a handle recess. The wall may have an inner surface which is also substantially smooth. It is preferred that the hollow is located in close proximity to an upper edge of the wall so as to maximise its effect of reinforcement. However, it is within the scope of the invention that the hollow is located between the wall top and the bottom.

**[0011]** Preferably the hollow is parallel to an axis about which the wall pivots for the purpose of collapsing and erection.

**[0012]** The wall may have more than one of the hollows, and may include other hollows provided at various locations in the wall. Other hollows may be disposed at an angle to the base, for example, at right angles. It is preferred that the hollows parallel to the base cut across those disposed an angle to the base.

**[0013]** The wall may include a door pivotally hinged thereto or therein, the elongate hollow forming part of, or being connected to, the door. The hollow may be provided along an upper perimeter of the door.

**[0014]** If the wall includes a recessed handle area, it is preferred that the recessed area has one or more holes for draining water.

**[0015]** In order to achieve a better understanding of the nature of the present invention, a preferred embodiment of a foldable bulk container according to the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a preferred embodiment of a foldable bulk container in accordance with the present invention;

Figure 2 is a side elevation of a wall of the container of Figure 1;

Figure 3 is a cross sectional view along the line C-C of Figure 2;

Figure 4 is a cross sectional view along the line D-D of Figure 3;

Figure 5 is a side elevation of another wall of the container of Figure 1, having a door;

Figure 6 is a cross sectional view along the line A-A of Figure 5;

Figure 7 is side elevation of the wall of Figure 5 with the door removed;

Figure 8 is a cross sectional view along the line E-E of Figure 7;

Figure 9 is a side elevation of the door for the wall of Figure 7;

Figure 10 is a cross sectional view along the line G-G of Figure 9;

Figure 11 is a cross sectional view along the line H-H of Figure 10;

Figure 12 is a cross sectional view along the line B-B of Figure 5;

Figure 13 is a plan view from above of the container of Figure 1; and

Figure 14 is a plan view from below of the container of Figure 1.

**[0016]** As shown in Figure 1, a foldable bulk container 10 includes a base 12 and a plurality of walls 14 and 16 surrounding the base 12 in use. The walls 14 and 16 are adapted to fold down over the base 12.

**[0017]** The foldable bulk container 10 of the present invention is made similar to that in Australian Patent No. 771773. The contents of AU771773 are incorporated herein by reference, except for first elongate hollows which will be described below. The structural details of the foldable bulk container 10 are omitted, since these can be found in AU771773.

**[0018]** Each wall 14 & 16 is pivotally connected to the base 12 to facilitate folding down thereof over the base 12. Each wall 14 and 16 in use is adapted to engage two adjacent walls 16 and 14 (respectively) by way of engagement means such as the tabs and receptacles as disclosed in AU771773. Each of the walls 14 and 16 has second elongate hollows (not visible) which are vertical in use and which are adapted to correspond to the second elongate hollow of adjacent walls so as to maximise rigidity of the bulk container 10.

**[0019]** Referring to Figures 2 and 3, it can be seen that the wall 16 includes reinforcing means in the form of a first elongate hollow 18. The first elongate hollow 18 in use is substantially parallel to the base 12. In the present embodiment, the first hollow 18 is located along the upper perimeter of the wall 16. The wall 16 also includes a cavity 20 which is located along the lower perimeter of the wall 16. This cavity is formed by a conventional moving core.

**[0020]** Turning to Figure 4, there are second (vertical) hollows 22, 24 and 26 distributed along the sides and middle of the wall 16. These second hollows 22, 24 and 26 are substantially perpendicular to the base 12 of the bulk container 10. The second vertical hollows 22, 24 and 26 have rounded corners.

**[0021]** Referring now to Figures 5 and 6, the wall 16 is engaged with adjacent walls 14 on opposing sides in an erect position. There are first elongate hollows 28 running along the upper perimeter of the walls 14 but this feature is optional. These first (horizontal) elongate hollows 28, 30 and 32 of the walls 14 and 16 may be adapted to align with corresponding first horizontal hollows in adjacent walls such that they form a 'continual ring' encircling the container 10. Cavities 30 and 32 are provided along the lower perimeters and middle of the walls 14. They however are not necessarily elongate in shape and are formed by conventional moving core.

**[0022]** Referring to Figures 7 and 8, the wall 14 has two L-shaped vertical elongate hollows located on opposing sides. The door has three hinges 38 located at the bottom edge 40 and a cut out 41 adapted to receive a door (not shown).

**[0023]** As can be seen in Figures 9, 10 and 11, the wall 14 may include a door 42 detachably hinged thereto. There is a first elongate hollow 44 running horizontally along the upper perimeter of the door 42. This hollow 44 is substantially parallel to the base 12. Also, the door 42 has two second vertical elongate cavities 48 and 50.

**[0024]** Referring now to Figures 13 and 14, the walls 14 and 16 have a step 52 similar to that shown in AU771773. Three feet are provided underneath the base 12, two feet 54 and 58 at opposing edges and one foot 56 intermediate those on the edges. Each foot 54, 56 & 58 has left, centre and right enlarged portions 60, 62, 64, 66, 68, 70, 72, 74, 76 & 78 evenly distributed along the length thereof. Each enlarged portion has a protrusion 80, 82, 84, 86, 88, 90, 92, 94 & 96, at least a portion of which (except that 88 for enlarged portion 70) is adapted to rest on a surface 98 of the step 52 to facilitate stacking of the bulk container 10.

**[0025]** As best shown in Figures 1 and 13, all of the hollows in the container 10 are configured and arranged so that the outer surface of the walls 14 & 16 is substantially planar, to minimise indents and recesses, although it may be necessary to provide a handle recess 100 (refer to Figure 1). The recess may have one or more holes 102 for draining water. It should be appreciated that the inner surface of the walls 14 & 16 is also substantially smooth. In other words, the hollows of the present invention are concealed within the walls 14 & 16 which gain considerable resistance to bulging. The hollows are provided by a mono-block moulding without any separately welded skin or crude blown air passage.

**[0026]** It should be noted that the elongate hollows may be provided at various locations in the walls 14 & 16. It is however preferred that the hollows are located in close proximity to the edges of the walls 14 &16 where a relatively high strength is required to bear the load of one or more containers in a stack. That way, the effect of reinforcement offered by the first elongate hollows is maximised.

**[0027]** The first horizontal elongate hollows such as 18, 20, 28 are substantially parallel to an axis about which the walls 14 & 16 pivot for the purpose of collapsing and erection.

**[0028]** In operation, the container 10 is designed to fold down to as low a height as possible and to provide a substantially planar upper surface when folded, so that

another folded container may be placed on top. The walls 16 are designed to be folded down first, between the erect walls 14, which are then folded on top of the walls 16.

**[0029]** The first elongate hollows of the present invention may be created by a hydraulically operated moving core which may be activated by a machine tool before a finished wall is taken out of a mould.

**[0030]** Now that a preferred embodiment of the present invention has been described in some detail, it will be apparent to those skilled in the art that the bulk container may have at least the following advantages over the admitted prior art:

1) the likelihood of water or rain being splashed upon the user in the process of erection of the walls may be minimised;

2) numerous drainage holes may no longer be required;

3) the container may have a superior resistance to outward or inward bulging;

4) minimal raw material is required for the manufacturing of the container;

5) thermal insulation of the container may be augmented (as much as 38% of the wall may be provided with a 36mm thick air gap);

6) significant ventilation slots may be included in the container given that part of the container still has only a single layer of material; and

7) provision of a significant additional capacity considering that the vast majority of the wall other than the portion occupied by the hollows is still externalised.

**[0031]** Those skilled in the art will appreciate that the invention described herein is susceptible to numerous variations and/or modifications other than those specifically described. For example, the first elongate hollows of the present invention may form part of, or being connected to, the walls 14 &16 and door 42. The walls 14 & 16 may include other hollows provided at various locations or disposed at different angles to the base 12. It is contemplated that as a general rule, the hollows parallel to the base 12 are designed to cut across those disposed at an angle to the base 12. This basically means that if and when any hollows parallel to the base 12 and those disposed at an angle to the base 12 cross paths, the latter would be cut short so as to allow the hollows parallel to the base 12 to run continuously. Finally, the elongate hollow may be mechanically formed by a precision machined horizontally sliding core so as to achieve precise and geometric wall thickness. The moving core is designed to cut across the top of any vertical cores.

**[0032]** It is to be understood that any acknowledgment of prior art in this specification is not an admission that this prior art forms part of the common general knowledge in the relevant art.

**[0033]** Expressions of the present invention are also set out in the following clauses:

1. A foldable bulk container including a base and a plurality of walls surrounding the base in use, the walls being adapted to fold down over the base, wherein at least one of the walls includes reinforcing means in the form of a first elongate hollow which, in use, is substantially parallel to the base.

2. The foldable bulk container of clause 1, wherein each wall is pivotally connected to the base to facilitate folding down thereof over the base.

3. The foldable bulk container of either clause 1 or 2, wherein each wall in use is adapted to engage of the other walls.

4. The foldable bulk container of any one of the preceding clauses, wherein each wall has at least one elongate hollow which is adapted to correspond to the elongate hollow of one or more of the other walls so as to maximise rigidity of the bulk container.

5. The foldable bulk container of any one of the preceding clauses, wherein the base includes at least two feet located underneath opposing lower edges of the base.

6. The foldable bulk container of clause 5, wherein the base includes a third foot located intermediate the two feet.

7. The foldable bulk container of any one of the preceding clauses, which includes four walls in a square or rectangular configuration.

8. The foldable bulk container of any one of the preceding clauses, wherein more than one of the walls includes one or more of the elongate hollows.

9. The foldable bulk container of any one of the preceding clauses, wherein the or each elongate hollow is mechanically formed by a precision machined horizontally sliding core so as to achieve precise and geometric wall thickness.

10. The foldable bulk container of any one of the preceding clause, wherein the or each hollow is configured and arranged so that the or each wall has an outer surface which is substantially flat or planar, to minimise indents and recesses.

11. The foldable bulk container of any one of the preceding clauses, wherein at least one of the walls has a handle recess.

12. The foldable bulk container of any one of the preceding clauses, wherein the or each wall has an inner surface which is substantially smooth.

13. The foldable bulk container of any one of the preceding clauses, wherein the first elongate hollow is located in close proximity to an upper edge of the or each wall so as to maximise its effect of reinforcement.

14. The foldable bulk container of any one of clauses 1 to 12, wherein the first elongate hollows is located between the wall top and the bottom.

15. The foldable bulk container of any one of the preceding clauses, wherein the first elongate hollow is parallel to an axis about which the wall pivots.

16. The foldable bulk container of any one of the preceding clauses, wherein the or each wall includes other hollows provided at various locations in the wall.

17. The foldable bulk container of any one of the preceding clauses, wherein the other hollows are disposed at an angle to the base.

18. The foldable bulk container of clause 17, wherein the other hollows parallel to the base cut across those disposed an angle to the base.

19. The foldable bulk container of any one of the preceding clauses, wherein the or each wall includes a door pivotally hinged thereto or therein, the first elongate hollow forming part of, or being connected to, the door.

20. The foldable bulk container of clause 19, wherein the first elongate hollow is provided along an upper perimeter of the door.

21. The foldable bulk container of clause 11, herein the recessed handle area has one or more holes for draining water.

## Claims

**1.** A foldable bulk container including a base and a plurality of walls surrounding the base in use, the walls being adapted to fold down over the base, wherein at least one of the walls includes reinforcing means in the form of a first elongate hollow which, in use, is substantially parallel to the base.

**2.** The foldable bulk container of claim 1, wherein each wall is pivotally connected to the base to facilitate folding down thereof over the base.

**3.** The foldable bulk container of either claim 1 or 2, wherein each wall in use is adapted to engage of the other walls.

**4.** The foldable bulk container of any one of the preceding claims, wherein each wall has at least one elongate hollow which is adapted to correspond to the elongate hollow of one or more of the other walls so as to maximise rigidity of the bulk container.

**5.** The foldable bulk container of any one of the preceding claims, wherein the base includes at least two feet located underneath opposing lower edges of the base.

**6.** The foldable bulk container of any one of the preceding claims, wherein more than one of the walls includes one or more of the elongate hollows.

**7.** The foldable bulk container of any one of the preceding claims, wherein the or each elongate hollow is mechanically formed by a precision machined horizontally sliding core so as to achieve precise and geometric wall thickness.

**8.** The foldable bulk container of any one of the preceding claim, wherein the or each hollow is configured and arranged so that the or each wall has an outer surface which is substantially flat or planar, to minimise indents and recesses.

**9.** The foldable bulk container of any one of the preceding claims, wherein the or each wall has an inner surface which is substantially smooth.

**10.** The foldable bulk container of any one of the preceding claims, wherein the first elongate hollow is located in close proximity to an upper edge of the or each wall so as to maximise its effect of reinforcement.

**11.** The foldable bulk container of any one of claims 1 to 9, wherein the first elongate hollow is located between the wall top and the bottom.

**12.** The foldable bulk container of any one of the preceding claims, wherein the first elongate hollow is parallel to an axis about which the wall pivots.

**13.** The foldable bulk container of any one of the preceding claims, wherein the or each wall includes other hollows provided at various locations in the wall.

**14.** The foldable bulk container of any one of the pre-

ceding claims, wherein the other hollows parallel to the base cut across those disposed at an angle to the base.

**15.** The foldable bulk container of any one of the preceding claims, wherein the or each wall includes a door pivotally hinged thereto or therein, the first elongate hollow forming part of, or being connected to, the door.

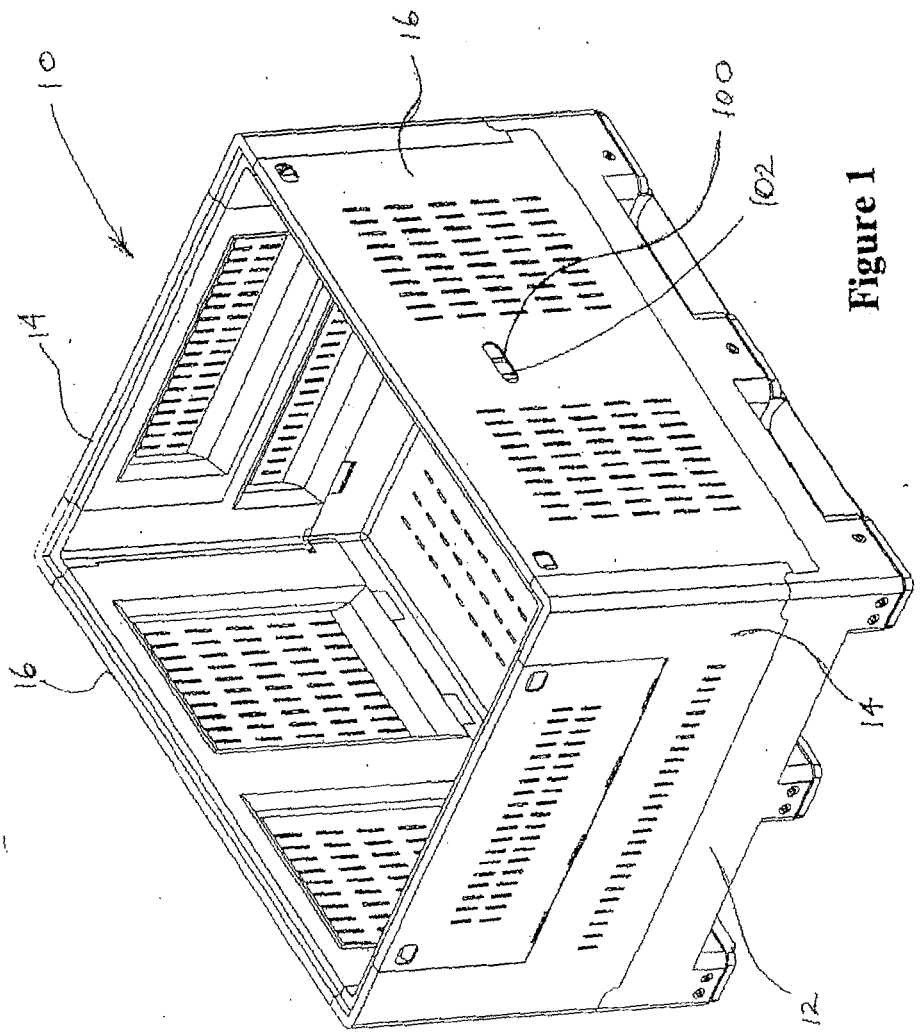



Figure 1

Figure 3

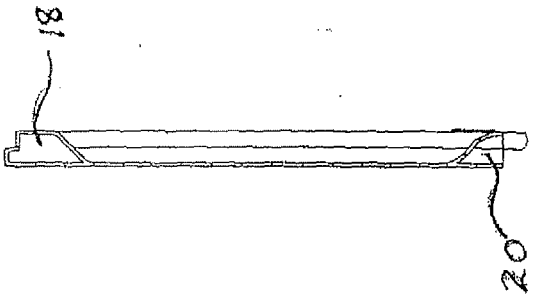
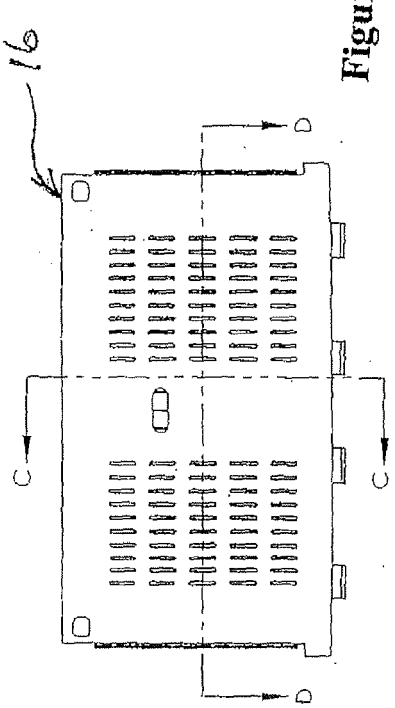



Figure 2



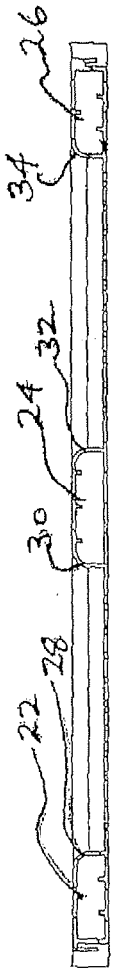




Figure 4

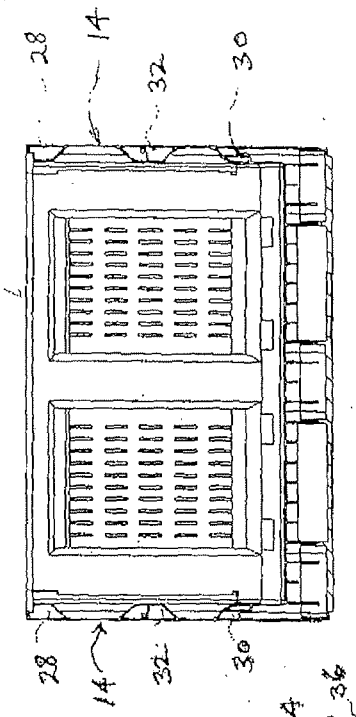



Figure 6

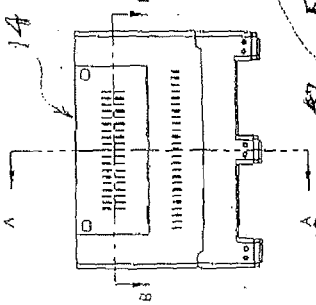



Figure 5

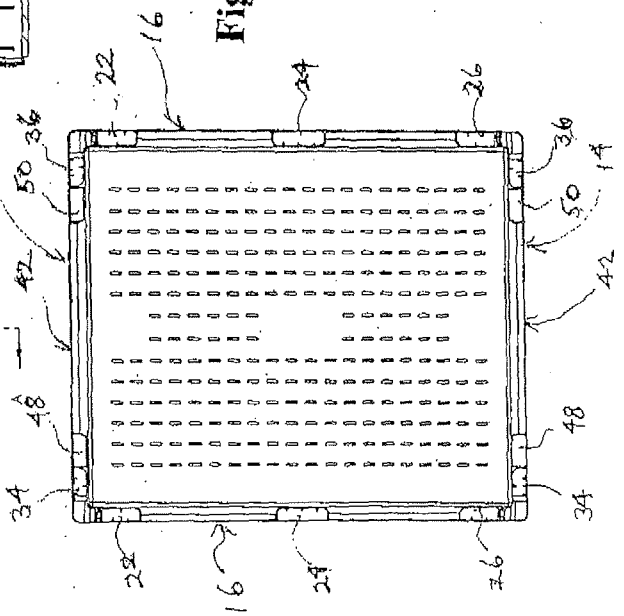



Figure 12

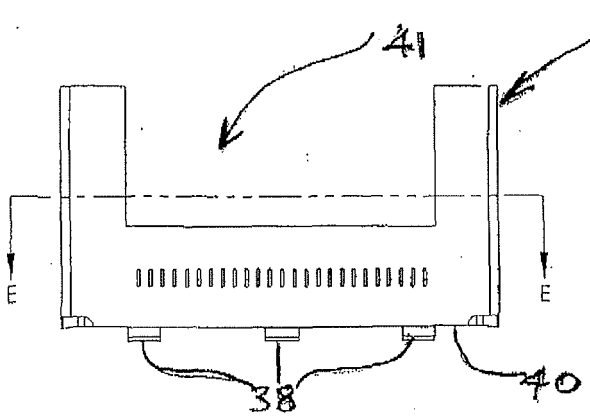



Figure 7

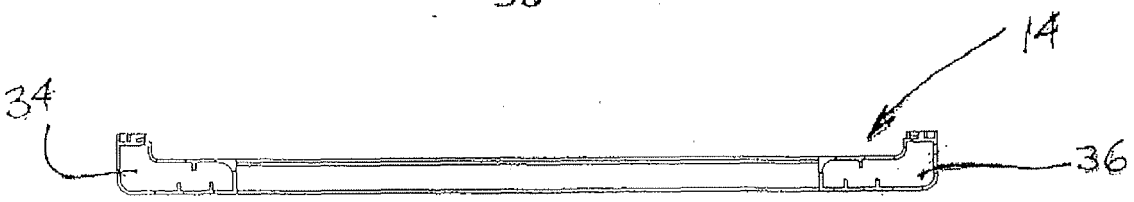
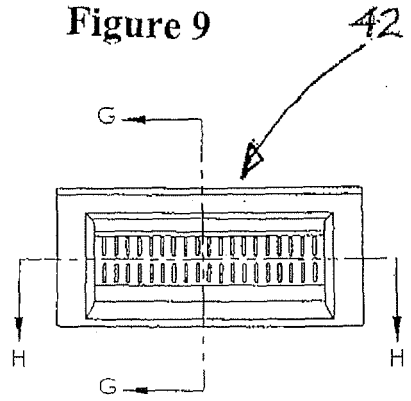



Figure 8

Figure 9



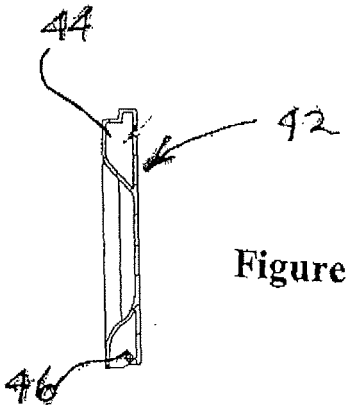




Figure 10

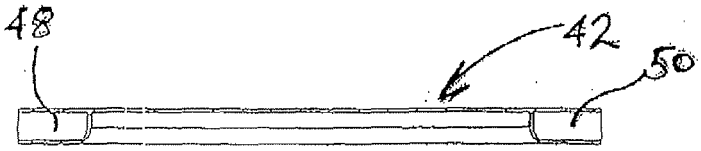



Figure 11

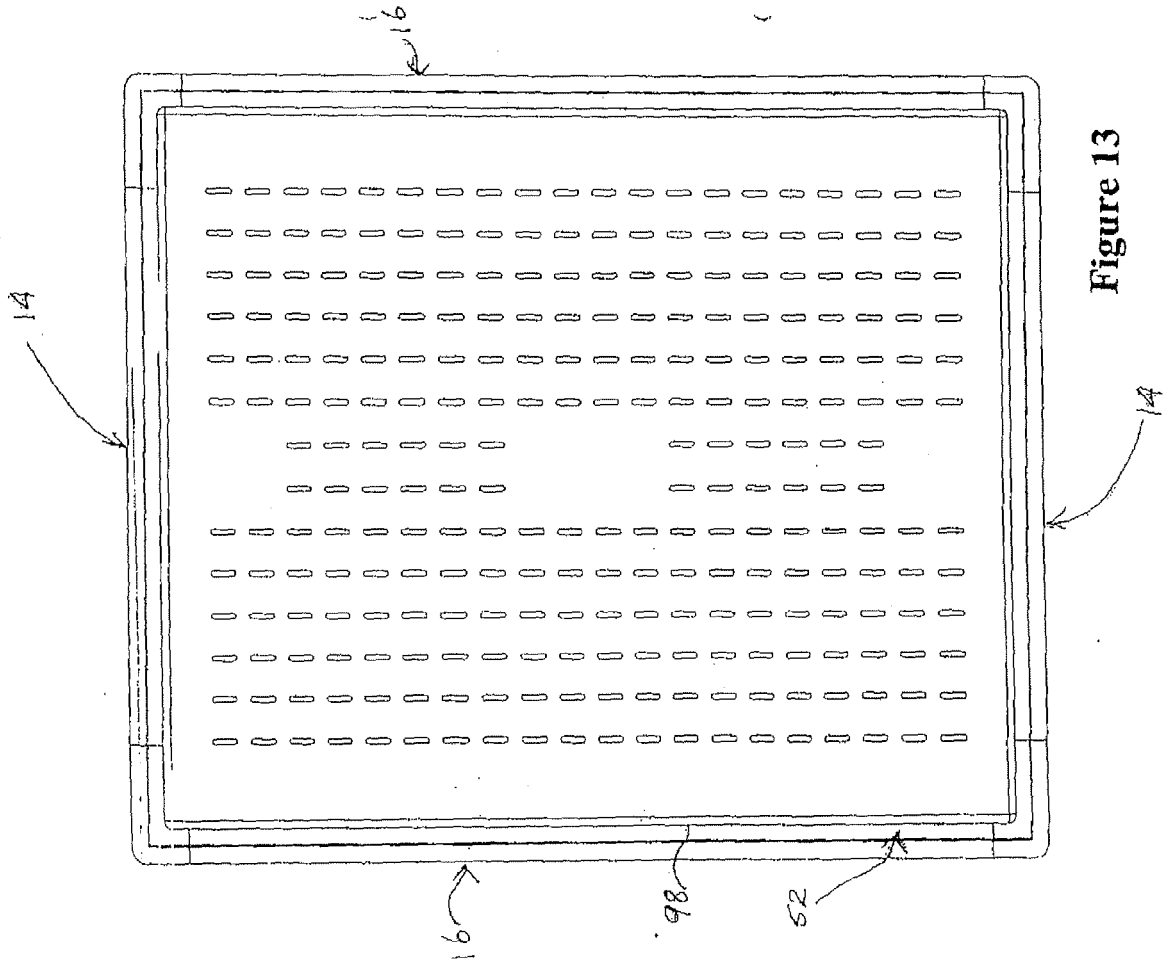



Figure 13

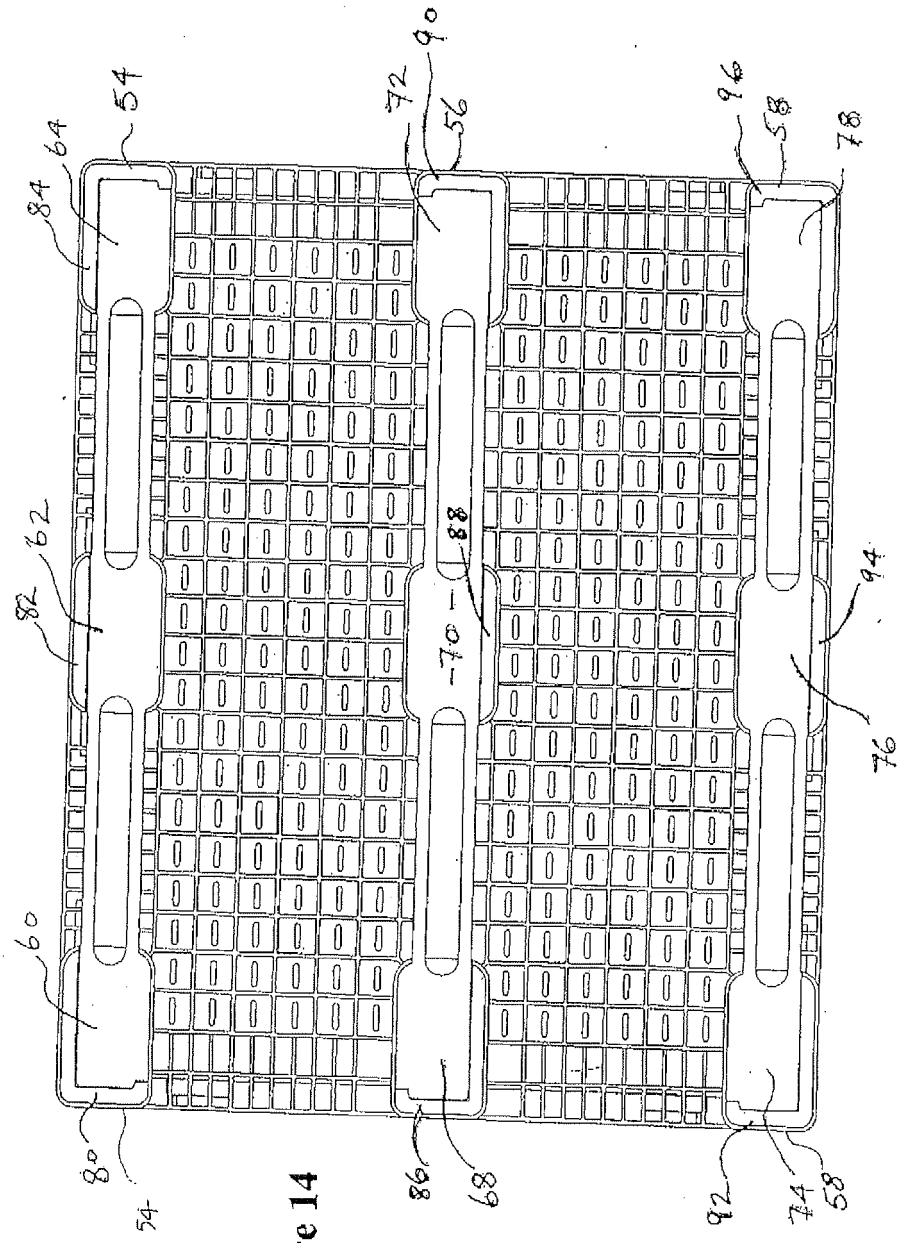



Figure 14

## REFERENCES CITED IN THE DESCRIPTION

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

### Patent documents cited in the description


- AU 77173 **[0006]**
- AU 771773 **[0017] [0017] [0017] [0018] [0024]**