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**Pallet and Pallet System**

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**ABSTRACT**

A pallet system 50 comprises a bunded pallet 10 and a demountable fence 52. The pallet 10 has a base 12 configured to receive members of a lifting apparatus enabling the pallet to be lifted by the base. The fence 52 has a sidewall structure 53 and a gate 56. , The fence 52 has a closed state where it is able to extend wholly about a periphery of the pallet 10, and an open state where the gate 56 is positioned to provide an opening 60 in the fence 52 to enable transfer of an article through the opening 60 onto or off the pallet 10.

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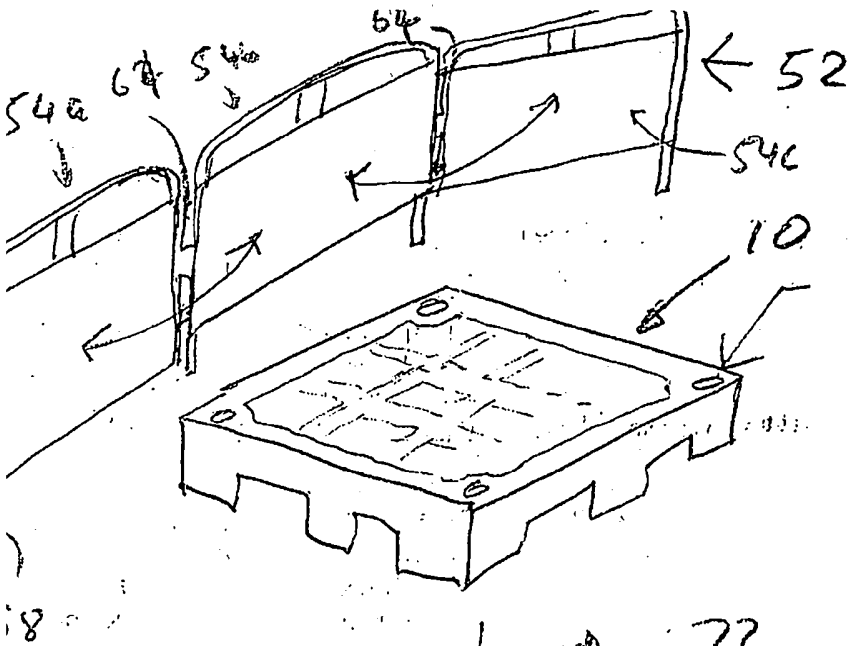


Fig 5

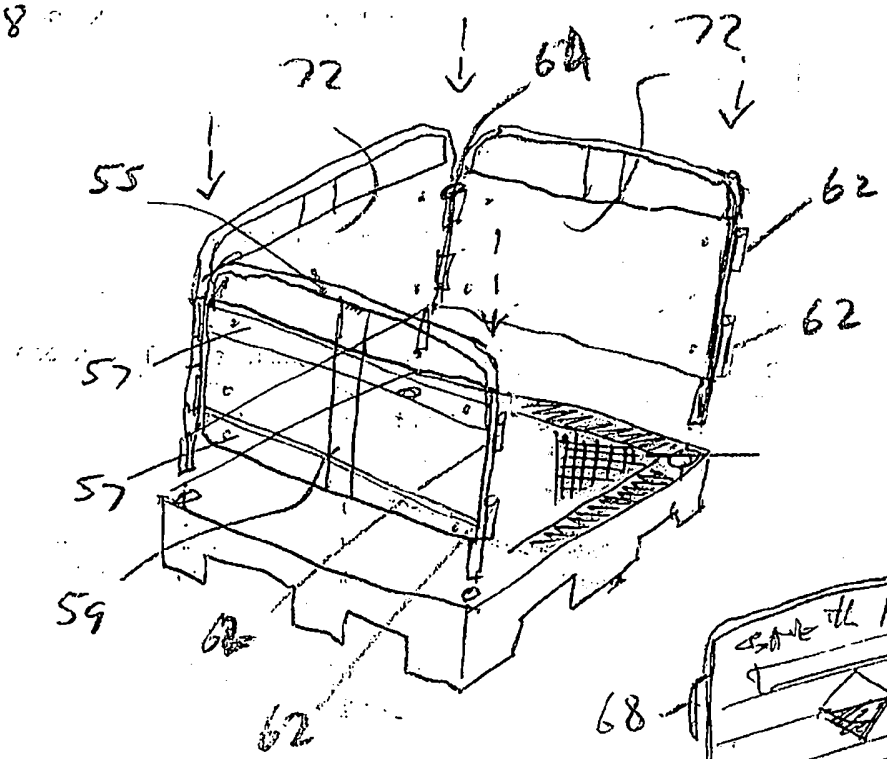


Fig 6

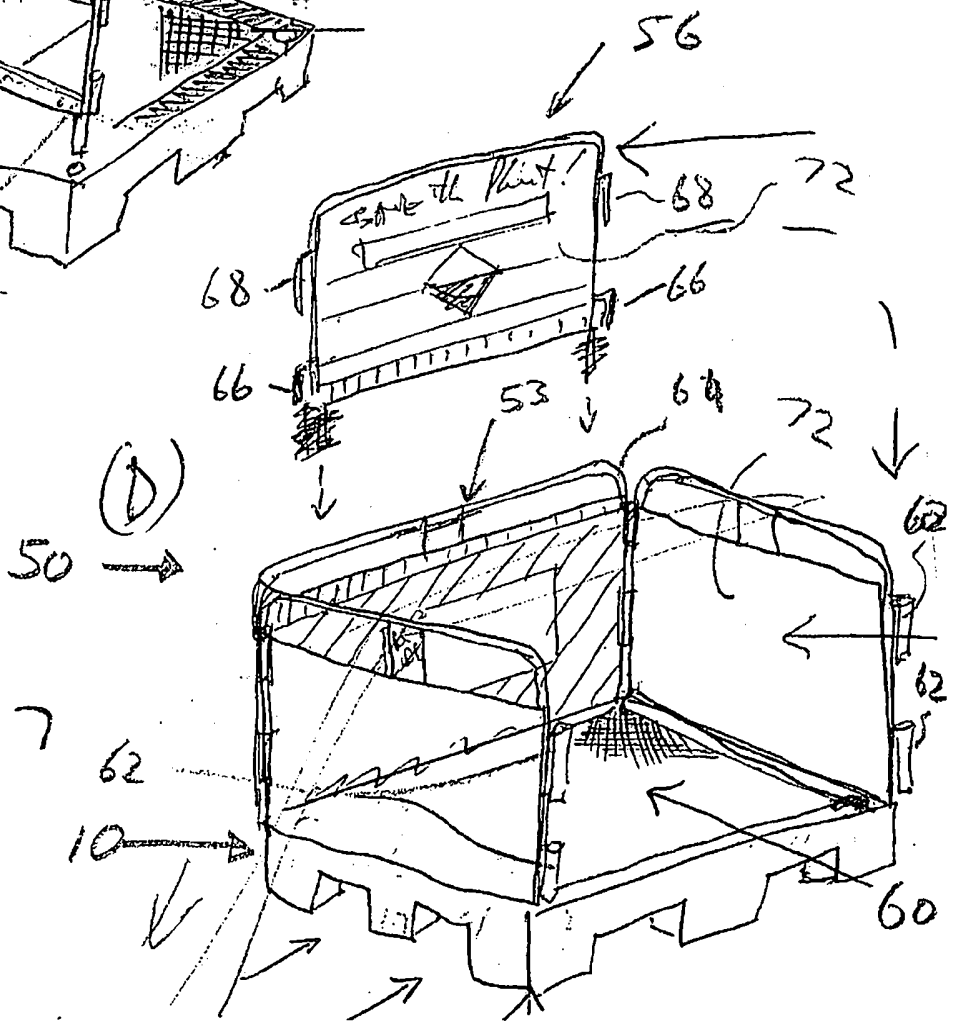


Fig 7

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Patents Act 1990

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**COMPLETE SPECIFICATION**

**Innovation Patent**

**Applicant(s):**

*Silverhorse Innovations Pty Ltd*

**Invention Title:**

*Pallet and Pallet System*

The following statement is a full description of this invention, including the best method for performing it known to us:

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# PALLET AND PALLET SYSTEM

## Technical Field

A pallet and pallet system are disclosed. The pallet and pallet system may be used to store and transport articles and in particular, but not exclusively, articles comprising or containing hazardous waste.

## Background Art

Articles comprising or containing hazardous waste may be stored and transported on pallets. The pallets may be in the form of traditional wooden pallets, or bunded pallets made from plastics material. At times hazardous liquid leaks from the articles on the pallet. Also the article may fall from a pallet when being lifted or transported. This can also result in the leakage of hazardous waste.

The above references to the background art do not constitute an admission that the art forms are part of the common general knowledge of a person of ordinary skill in the art. The above references are also not intended to limit the application of the pallet system as disclosed herein.

## Summary of the Disclosure

In a first aspect there is disclosed a pallet system comprising:

a bunded pallet having a base configured to receive members of a lifting apparatus enabling the pallet to be lifted by the base; and,

a fence demountably connectable to the pallet the fence having a sidewall structure and a gate, the fence having a closed state where the fence is able to extend wholly about a periphery of the pallet, and an

open state where the gate is positioned to provide an opening in the fence to enable transfer of an article through the opening onto or off the pallet.

In one embodiment the pallet comprises one or more recesses for receiving the fence.

In one embodiment the one or more recesses comprise a plurality of holes and the fence comprises a plurality of elements configured to seat in the holes.

In one embodiment the gate and the side wall structure are relatively configured to engage and disengage to close or open the opening by relative motion in a plane parallel to a plane of the gate.

In one embodiment the gate is arranged to connect to the side wall structure in a position elevated with respect to the side wall structure when the fence is in the open state.

In one embodiment the gate is supported on a portion of the side wall structure opposite the opening when the fence is in the open state.

In one embodiment the gate carries indicia relating to one or more of loading limits of the pallet or safe handling of articles on the pallet.

In one embodiment an inwardly facing surface of the fence comprises an electrically insulating material.

In one embodiment the sidewall structure comprises a plurality of sidewalls pivotally coupled to each other.

In one embodiment the base comprises one or more of channels configured to receive one or more times of a forklift truck.

In one embodiment the base comprises a receptacle in which

liquid falling onto the pallet in an area surrounded by the fence drains, and wherein the pallet includes a support grate overlying the receptacle.

In one embodiment the pallet structure comprises an absorbent pad disposed in the receptacle.

In one embodiment the absorbent pad comprises a material having properties to neutralize action of the liquid.

In one embodiment the material is arranged to neutralize battery acid.

In a second aspect there is disclosed a pallet comprising:

a base configured to receive members of a lifting apparatus enabling the pallet to be lifted by the base, the base having a receptacle into which liquid falling onto the pallet drains and a support grate overlying the receptacle; and, an absorbent pad disposed in the receptacle.

In one embodiment the absorbent pad comprises a material having properties to neutralize action of the liquid.

In one embodiment the support grate is demountable engaged in the base.

In a third aspect there is disclosed a pallet system comprising a pallet according to the second aspect; and a fence demountable connectable to the pallet the fence having a demountable gate, the fence having a closed state where the fence is able to extend wholly about a periphery of the pallet, and an open state where the gate is positioned to provide an opening in the fence to enable transfer of an article through the opening onto or off the pallet.

In one embodiment the pallet comprises one or more recesses for receiving the fence.

In one embodiment the one or more recesses comprise a plurality of holes and the fence comprises a plurality of elements configured to seat in the holes.

In one embodiment fence comprises a side wall structure and the gate and the side wall structure are relatively configured to engage and disengage close or open the opening by relative motion in a plane parallel to a plane of the gate.

In one embodiment the gate is arranged to connect to the side wall structure in a position elevated with respect to the side wall structure when the fence is in the open state.

In one embodiment gate is supported on a portion of the side wall structure opposite the opening when the fence is in the open state.

In one embodiment the gate carries indicia relating to one or more of loading limits of the pallet or safe handling of an article on the pallet.

In one embodiment an inwardly facing surface of the fence comprises an electrically insulating material.

In one embodiment the sidewall structure comprises a plurality of sidewalls pivotally coupled to each other.

Brief description of the Drawings

Notwithstanding any other forms which may fall within the scope of the pallet system as set forth in the Summary, specific embodiments will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is an exploded view of an embodiment of the

pallet from the top;

Figure 2 is an exploded view from the bottom of the pallet shown in Figure 1;

Figure 3 is a section view of the pallet;

Figure 4 is a schematic representation of an absorbent pad which may be incorporated in the pallet;

Figure 5 is a schematic representation of a pallet system incorporating a pallet of the type shown in Figures 1-3 and a fence in a disassembled state;

Figure 6 is a representation of the pallet system shown in Figure 5 with the fence in the process of being coupled to the pallet;

Figure 7 is a schematic representation of the pallet system illustrating a gate of the fence connectable in two different positions.

Detailed Description of the Preferred Embodiments

Figure 1 illustrates an embodiment of a bunded pallet 10. The bunded pallet 10 comprises a base 12 having a receptacle 14 into which liquid falling onto the pallet 10 can drain. The base 12 in this embodiment is of a generally rectangular configuration and is provided with four sides 16a, 16b, 16c and 16d (hereinafter referred to in general as "sides 16"). As seen clearly in Figures 1 and 3, in the inner surfaces 18a-18d (hereinafter referred to in general as "inner surfaces 18") of the sides 16 are formed, at mid-height level, with a reduction of thickness to form a ledge 20 which extends wholly about receptacle 14. A planar liquid impervious wall 22 extends across and perpendicular to the sides 16 to form a bottom wall of the

receptacle 14. Thus the receptacle is defined by the inner surfaces 18 of the sides 16 and the wall 22.

A grate 24 having a matrix of openings 26 is demountably supported in the base 12 by sitting on the ledge 20. When the grate 24 is seated on the ledge 20, upper surface 30 of the grate 24 lies flush with an upper surface 32 of the sides 16.

A matrix of the strengthening ribs 34 are formed integrally with a surface of the wall 22 outside of the receptacle 14. A plurality (in this instance nine) legs 36 are formed integrally with and depend from the matrix of ribs 34. The legs 36 themselves are arranged in a 3x3 matrix like pattern. Further, the legs 36 are mutually spaced apart to create channels 38 there between. The channels 38 are configured to enable the pallets 10 to be lifted by the base. For example this may be achieved by inserting or otherwise placing the tines of a forklift truck into respective parallel channels 38.

With reference to Figure 1, the inner surfaces 18 at corners 40 of the base 12 extend diagonally to from respective diagonal surfaces 42. Recesses in the form of holes 44 are formed at each corner 40 between the diagonal surface 42 and the adjacent sides 16 of that corner 40.

When the grate 24 is seated on the ledge 20 a void 46 is created between the wall 22 and a facing underside of the grate 24. The void 46 corresponds to the space bound by the wall 22, inner surfaces 18 and diagonal surfaces 42 up to the ledge 20. An absorbent mat or pad 48 is provided to substantially fill the void 46. The pad 48 is made of a material which is able absorb and thereby contain liquid which drains into the receptacle 14. Thus, if the bunded pallet 10 is dropped or held at an angle inclined to the horizontal, liquid in receptacle 22 which is absorbed by

the pad 48 will be retained within the pad 48 and thus does not spill from the pallet 10. In some embodiments the pad 48 comprises or includes a material which is able to neutralize adverse effects or undesirable characteristics of liquid which may drain into receptacle 22. For example, when the pallet 10 is used to carry lead acid batteries, the pad 48 may contain a chemical to neutralize battery acid which may spill from the batteries into the receptacle 22.

Figures 5-7 depict a pallet system 50 which comprises the pallet 10 together with a fence 52 which is demountably connectable to the pallet 10. The fence 52 comprises a sidewall structure 53 which in this embodiment comprises three sidewalls 54a, 54b and 54c (hereinafter referred to in general as "sidewalls 54") and a gate 56 (shown in Figure 7). The sidewalls 54 are pivotally coupled together so that they can be folded or pivoted onto each other to form a flat pack for transportation purposes. Each of the side walls 54 is of a length substantially equal to a length of a side 16 of the bunded pallet 10. The side walls 54 are provided with depending feet or pins 58 which are configured and located so as to seat in or otherwise engage the holes 44. In this instance, a middle side wall 54b is formed with two feet 58 while opposite side walls 54a and 54c are each with one foot 58.

Each side wall 54 and the gate 56 comprises an outer frame 55 in the configuration of an inverted "U" with a straight and elongated bottom. Free ends of the frame 55 form the legs 58. Two spaced apart flat cross members 57 extend across the outer frame 55. A slat 59 extends perpendicular to and across the cross members 57 and to the outer frame 55. In one embodiment the outer frame 55, cross members 57 and slat 59 are made from a metal such as but not limited to aluminium.

As shown clearly in Figure 7, when the side wall structure 53 (which is equivalent to the fence 52 without the gate 56 extending between sidewalls 54a and 54c) is demountably coupled to the pallet 10, an opening 60 is formed between the side walls 54a and 54c to allow article to be placed on or taken from the pallet 10. This corresponds to the fence 52 being open.

Each of the side walls 54a and 54c distant the side wall 54b is provided with two aligned sleeves 62. The sleeves 62 may be generally aligned with the adjacent ends of the cross members 57. A single sleeve 64 is provided on opposite sides of the side wall 54b at a location near opposite ends of its upper most cross member.

The gate 56 comprises a side wall of substantially the same shape and configuration as the side wall 54. Near a lower end on each sides of the gate 56 there is provided respective depending right angle fingers 66. Towards an upper end on each side of the gate 56 there is provided two depending right angle fingers 68.

The gate 56 can be coupled to the side wall structure 53 to close the opening 60 by inserting the fingers 66 and 68 into the sleeves 62. This requires a lifting then lowering of the gate 56 relative to the side wall structure 53 in a plane of the gate. In this configuration the fence 52 is closed and extends wholly about the periphery of the pallet 10. The fence 52 when in this configuration can assist in preventing articles on the pallets 10 from falling from the pallet as may otherwise occur when pallet 10 is being transported, lifted or otherwise moved.

However when the pallet 10 is located in position to receive articles, the gate 56 is decoupled from the sleeves 62 to thereby create the opening 60 and is

reconnected or engaged with the side wall structure 54 by locating the fingers 66 in the sleeves 64. This again requires a lifting then lowering of the gate 56 relative to the side wall structure 53 in a plane of the gate. In this configuration the gate 56 is elevated with respect to the side wall structure.

The gate 56 can be provided with indicia or markings to provide information regarding loading limits of the pallet 10 or safe handling of articles on the pallet 10. The indicia or markings may also include hazardous waste warnings.

Inwardly facing surfaces 70 of the side wall structure 53 and the gate 56 may comprise an electrically insulating material such as a panel 72 made from plastics material. The provision of the electrically insulating material is particularly beneficial when the system 10 is used for the collection and transport of lead acid batteries. In this regard, if a battery were to tip or to otherwise fall so that its terminals bear against the panel 72, the terminals would be prevented from electrically shorting.

Now that embodiments of the pallet and pallet system have been described it will be apparent to those of ordinary skill in the art that numerous modifications and variations may be made. For example, the fence 52 (i.e. side wall structure 53 and gate 56) is described in one embodiment of being made of metal. However the fence 52 may be made from a UV stabilize high strength plastics material. In such an instance if the pallet 10 were used to collect and transport lead acid batteries there would be no need for the previously described panels 72 of electrically insulating material.

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Claims

1. A pallet system comprising:
a bunded pallet having a base configured to receive members of a lifting apparatus enabling the pallet to be lifted by the base; and,
a fence demountably connectable to the pallet the fence having a sidewall structure and a gate, the fence having a closed state where the fence is able to extend wholly about a periphery of the pallet, and an open state where the gate is positioned to provide an opening in the fence to enable transfer of an article through the opening onto or off the pallet.

2. The pallet structure according to claim 1 wherein the gate and the side wall structure are relatively configured to engage and disengage to close or open the opening by relative motion in a plane parallel to a plane of the gate.

3. The panel system according to claim 1 or 2 wherein the gate is supported on a portion of the side wall structure opposite the opening when the fence is in the open state, and the gate carries indicia relating to one or more of loading limits of the pallet or safe handling of articles on the pallet.

4. The pallet structure according to any one of claims 1-3 wherein the sidewall structure comprises a plurality of sidewalls pivotally coupled to each other.

5. The pallet structure according to any one of claims 1-4 wherein the base comprises: a receptacle in which liquid falling onto the pallet in an area surrounded by the fence drains, and wherein the pallet includes a support grate overlying the receptacle; and, an absorbent pad disposed in the receptacle.

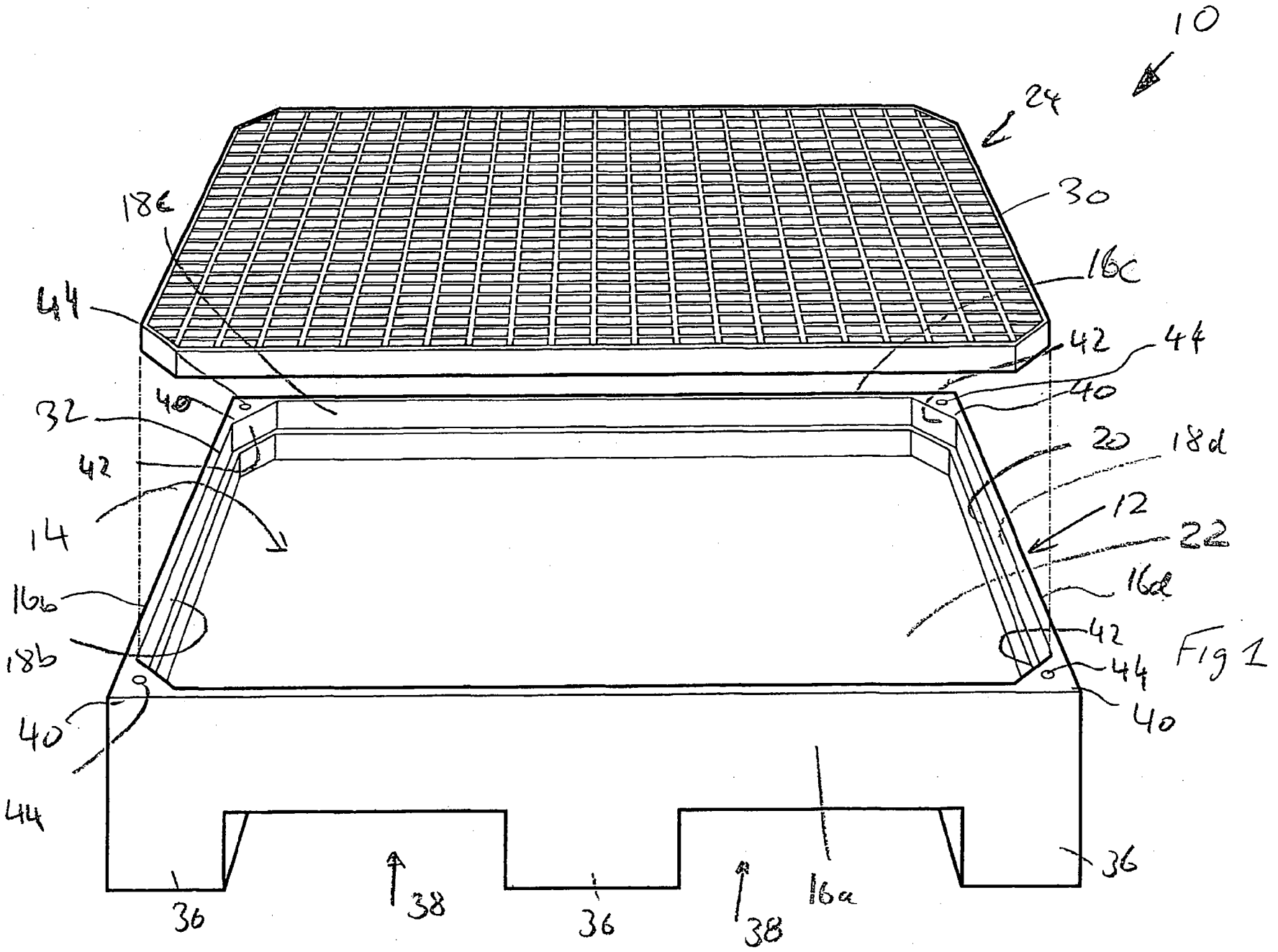
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Fig 1

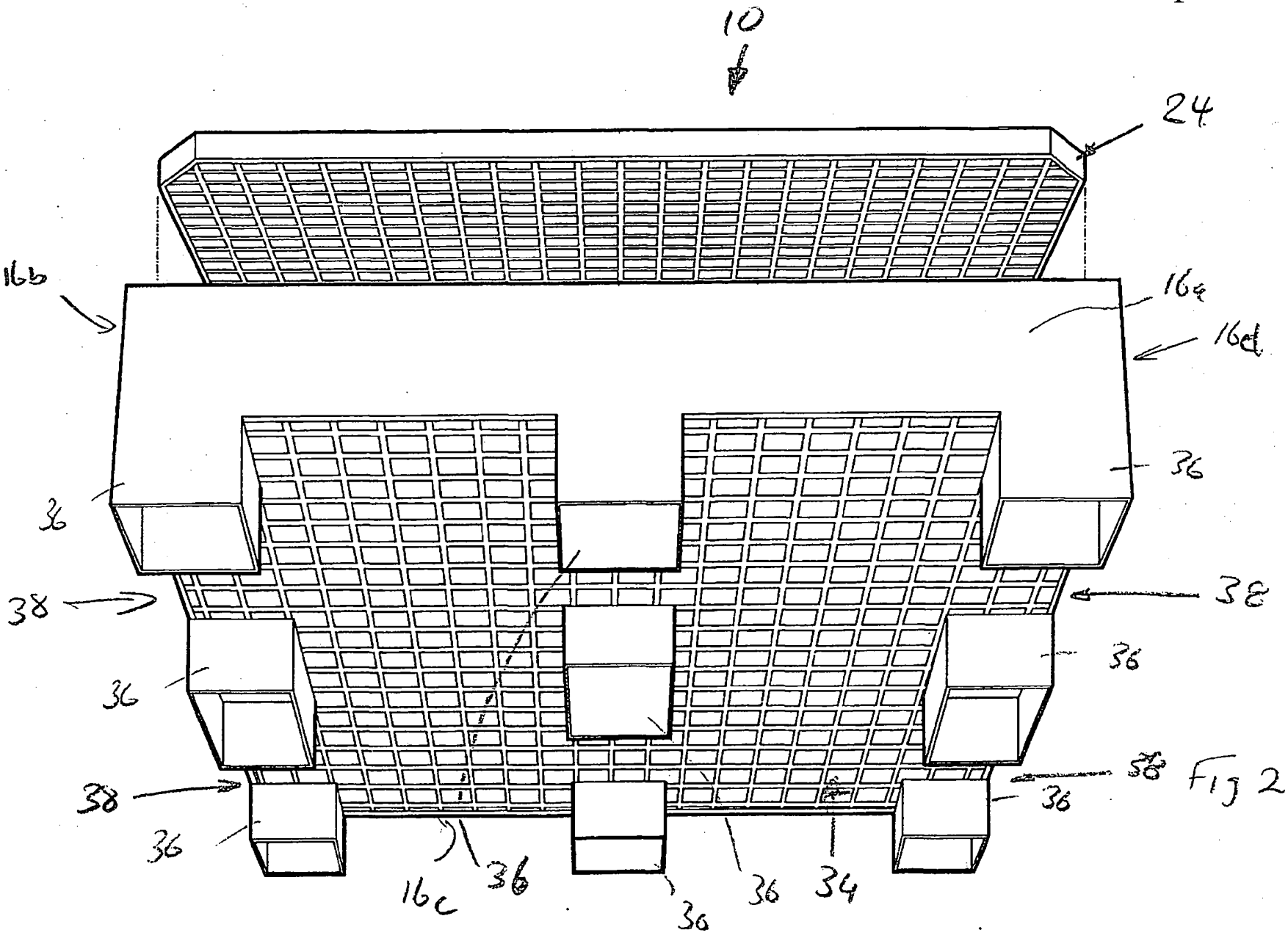


Fig 2

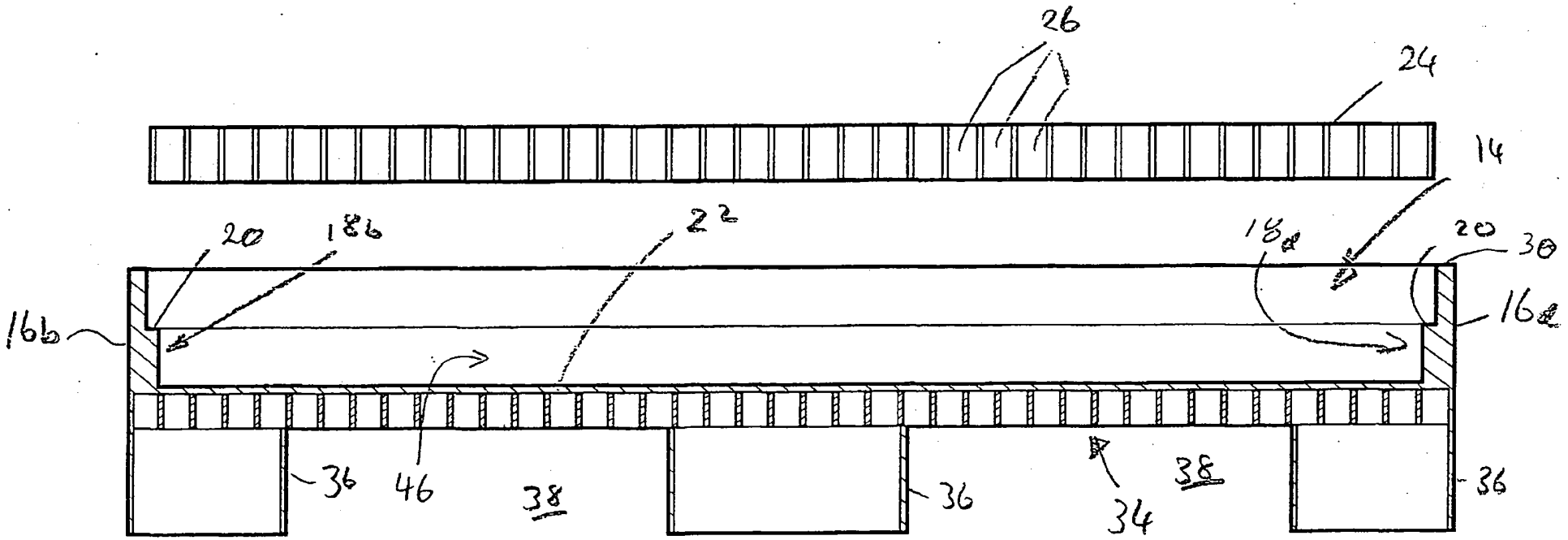


Fig 3

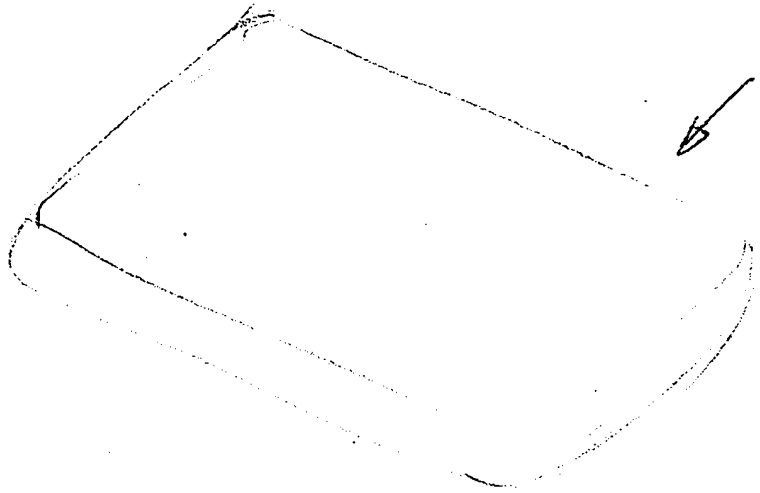


Fig 4

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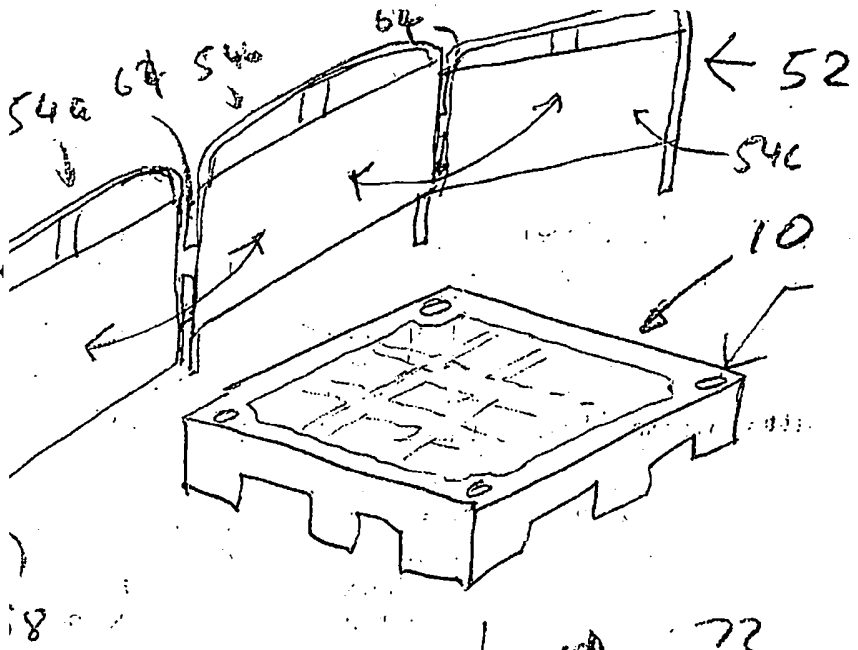


Fig 5

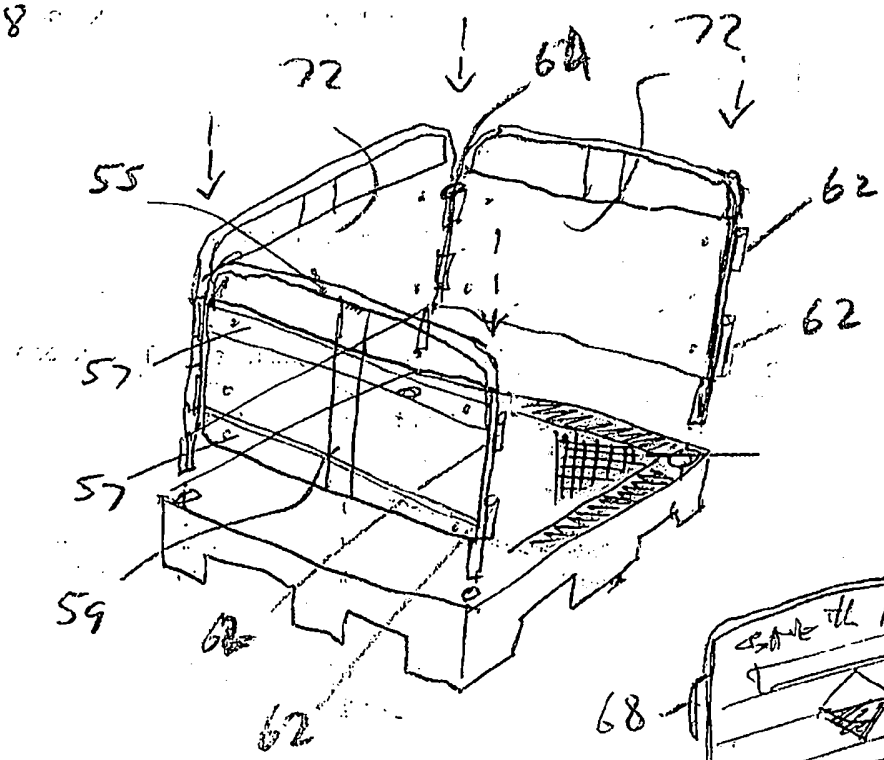


Fig 6

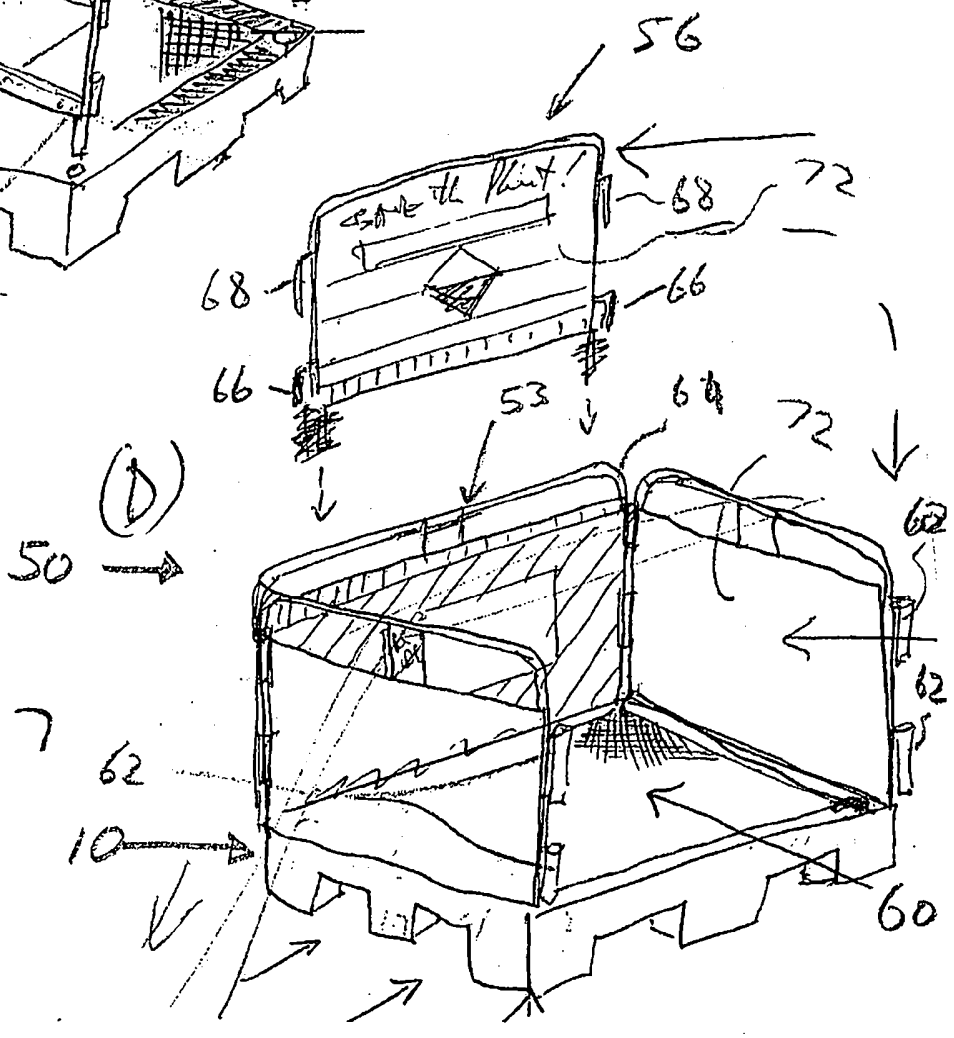


Fig 7