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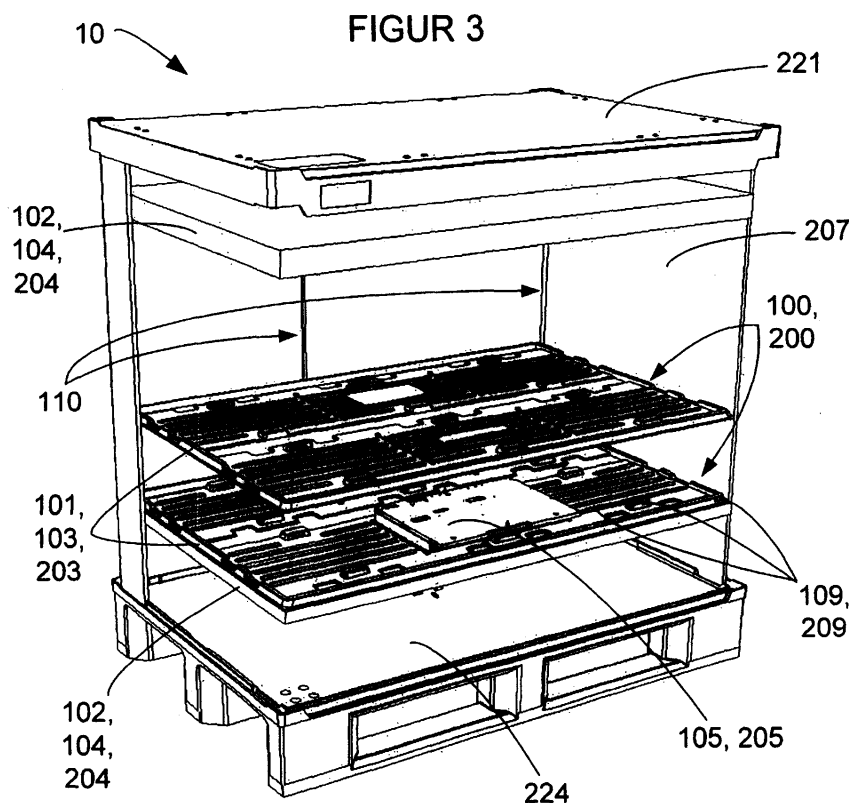
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(54) **Collapsible packaging system**

(57) A collapsible packaging system (10) for storing
at least one component (105, 205), comprising at least
one bottom part (223), at least one top part (221), and at
least one packaging arrangement (100, 200), wherein

the packaging arrangement (100, 200) for storing at least
one component (105, 205), comprises at least one tray
(101, 102, 103, 104, 203, 204) being adapted to hold and
set the component and to provide individual mechanical
protection for at least parts of the component.



Description

Technical Field

[0001] The present invention relates to a collapsible packaging system utilizing a packaging arrangement for storing components and comprising at least one tray.

Description of Prior Art

[0002] Packaging systems comprising trays for holding and securing and/or setting/aligning various components or items packed together in layers have been known in a number of variants, e.g. in the electronic field.

[0003] A pallet for transport of items in the form of bobbins is disclosed in US-A-4 580 680. The pallet comprises a bottom part and a cover/lid part, the parts having corresponding configurations. Several pallets filled with items may be superimposed, i.e. placed on each other in stacks and stacks, wherein the components are load carrying. The sides of the bottom part and the lid part facing the components are provided with projections to be received by recesses in the components. A detachable/loose partition is provided between the bottom part and the lid part to protect the components.

[0004] Prior art packaging systems often utilize parts made of different materials, e.g. a wooden pallet as a bottom part with an upper lid and side walls made of cardboard or carton.

[0005] Prior art packaging systems have several disadvantages. They do not provide a sufficient mechanical protection for the packed/wrapped items. Moreover, prior art packaging systems are also cumbersome and heavy to handle after unloading of items requiring a lot of space during packing, transport, unloading, and returning them as returnable empties, thereby requiring too much resources in terms of volume and life cycle. The recycling of prior art packaging systems is also very complicated because the pallets, the lid, and the side walls often are made of different materials requiring different handling methods and different ways of recycling. These materials are also non-conductive, which is a great disadvantage, especially for electronic components. These types of materials are also very easy to damage creating debris and/or dust during handling, and are also sensitive damage creating debris and/or dust during handling, and are also sensitive for moisture or water, i.e. they are often permeable for water, whereby any stored items and the packaging system itself may be water-damaged, or even destroyed.

Summary of the Invention

[0006] An object of the present invention is to provide a solution to the above mentioned problems by presenting a improved packaging system and arrangement.

[0007] According to the invention, this object is achieved by a packaging system and arrangement of the

type stated by way of introduction, which have the features that appear from claim 1, preferred embodiments being defined in the appended claims 2-25.

[0008] By the improved packaging system and arrangement of the invention and preferred embodiments of the invention, several advantages are obtained. Each of the stored components is at least partly provided with an individual mechanical protection enhancing the securing and holding of the components in place and the repeatability when handled. Both manual and automated handling of the components is simplified since the tray/s set, hold, stay, and/or orientate the components making the packaging system and arrangement very user-friendly. The rejection rate of valuable components that often are sensitive to static electricity and easily damaged may be eliminated or at least decreased since one embodiment of the system and arrangement may protect against electrical impulses. Access to the components on the tray/s placed accessible at the top of a tray or a stack of trays is also improved since at least one of the tray embodiments do not have high sides obstructing access. The trays in one embodiment relieve loads/forces/impacts from the components and protect them against damages. The components are also securely held and positioned. This also eliminates the risk of damages on the components due to the physical proximity of other components or wrapping material, equipment for handling, or gripping appliances, even if handled carelessly.

[0009] The packaging system and arrangement according to the invention enable an extraordinarily effective transport system with a high efficiency in use of available volume, i.e. the system maximizes the packaging density when erected and filled with items and also when the system is emptied/cleared of items and empty, and collapsed system units are returned, and minimizes the required amount of packaging material, the weight, and costs for packaging material.

[0010] Another advantage is that one packaging system and arrangement embodiment use nestable trays that further improve the resource efficiency in terms of used volume and life cycle. Hence, the stackable and/or nestable trays are space-saving when storing and/or returning empty trays requiring even less storage and transport space.

[0011] Moreover, the packaging system and arrangement eliminate/limit the development of dust and any dirt/dirtying/soiling of the components and the associated area where the components are loaded/unloaded.

[0012] Furthermore, at least one embodiment of the packaging system and arrangement is at least partly made of plastic and therefore impermeable to moisture/water, i.e. do not absorb moisture/water, and/or also resistant to solvents, whereby a high structural strength in moist/damp environments is achieved.

[0013] One embodiment of the invention comprises a packaging arrangement (100, 200) for storing at least one component (105, 205), comprising at least one tray (101, 102, 103, 104, 203, 204) being adapted to hold and

set the component and to provide individual mechanical protection for at least parts of the component, and means (101, 102, 103, 104, 203, 204) for load take-up.

[0014] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the tray (101, 102, 103, 104, 203, 204) is provided with at least one depression or at least one projection (109, 209), which at least partially enclose the component (105, 205).

[0015] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the tray (101, 102, 103, 104, 203, 204) is configured so that load is at least partially carried by the component (105, 205).

[0016] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the tray (101, 102, 103, 104, 203, 204) is configured so that load is at least partially carried by the tray.

[0017] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the component (105, 205) has a uniform shape.

[0018] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the component (105, 205) has an at least partially non-uniform shape.

[0019] Another embodiment of the invention comprises a packaging arrangement (100, 200) comprising at least one pair of trays (101, 102, 103, 104, 203, 204) that are stackable.

[0020] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the trays (101, 102, 103, 104, 203, 204) are nestable.

[0021] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein at least one tray (101, 103, 203) or the means (102, 104, 204) for load take-up is at least partially made of a dissipative and/or conductive material for protecting the component (105, 205) from electric pulses.

[0022] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein at least one tray (101, 103, 203) is at least partially compactible.

[0023] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the means (102, 104, 204) for load take-up is at least partially compactible.

[0024] Another embodiment of the invention comprises a packaging arrangement (100, 200), wherein the tray (101, 103, 203) comprises a compactible section (102, 104, 204).

[0025] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the means (101, 102, 103, 104, 203, 204) for load take-up comprises a compactible section (102, 104, 204).

[0026] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein the compactible section (101, 102, 103, 104, 203, 204) is made of foamed, expanded, cellular, or aerated plastic, or rubber.

[0027] Another embodiment of the invention comprises a packaging arrangement (100, 200) wherein at least one

tray (101, 102, 103, 104, 203, 204) is provided with a skirt-like peripheral edge.

[0028] Another embodiment of the invention relates to a collapsible packaging system (10) for storing at least one component (105, 205), comprising at least one bottom part (223), at least one top part (221), and at least one packaging arrangement (100, 200) when the packaging system (10) is used as a component storage.

[0029] Another embodiment of the invention relates to a collapsible packaging system (10) further comprising at least one side wall (207) for connecting the bottom part (223) to the top part (221) and for at least partially enclosing the packaging arrangement (100, 200) when the packaging system (10) is used as a component storage.

[0030] Another embodiment of the invention relates to a collapsible packaging system (10) wherein the side wall (207) is detachable connected to the packaging system (10) and adapted to fit between the bottom part (223) and the top part (221) when the packaging system is erected and/or when it is collapsed.

[0031] Another embodiment of the invention relates to a collapsible packaging system (10) wherein the side wall (207) is bendable so that it fits inside an enclosure defined by the bottom part (223) and the top part (221) when the packaging system (10) is erected and/or when it is collapsed.

[0032] Another embodiment of the invention relates to a collapsible packaging system (10) wherein the side wall (207) is bendable along at least one fold (110) extending alongside the side wall.

[0033] Another embodiment of the invention relates to a collapsible packaging system (10) wherein the side wall (207) is bendable along at least one fold (110) extending vertically or horizontally alongside the side wall.

[0034] Another embodiment of the invention relates to a collapsible packaging system (10) wherein the side wall (207) is bendable along at least one fold (110) extending vertically alongside the side wall and at least one fold extending horizontally alongside the side wall.

[0035] Another embodiment of the invention relates to a collapsible packaging system (10) wherein the side wall (207) is formed by one or more sections.

[0036] Another embodiment of the invention relates to a collapsible packaging system (10) wherein at least one of the parts (101, 102, 103, 104, 203, 204, 221, 223) forming the packaging system (10) is at least partially made of a dissipative and/or conductive material for protecting the component (105, 205) from electric pulses.

[0037] Another embodiment of the invention relates to a collapsible packaging system (10) wherein all of the parts (101, 102, 103, 104, 203, 204, 207, 221, 223) forming the packaging system (10) are at least partially made of a dissipative and/or conductive material for protecting the component (105, 205) from electric pulses.

[0038] Another embodiment of the invention relates to a collapsible packaging system (10) wherein the bottom part (223) and the top part (221) are configured for mating

with the side wall (207) when the packaging system (10) is erected and for mating with each other when the packaging system is collapsed.

Brief Description of the Drawings

[0039] The present invention will now be described in more detail with reference to the enclosed drawings, in which:

Fig 1 is a perspective view of a packaging system according to an embodiment of the invention,
 Fig 2 is a perspective cut-away view of the packaging system in fig 1,
 Fig 3 is a perspective cut-away view of the packaging system in fig 2 according to another embodiment of the invention,
 Fig 4 is an exploded view of the packaging system in fig 1 and 2 with parts removed for clarity reasons,
 Fig 5 is a perspective view of the packaging system in figs 1-4 in a collapsed state,
 Fig 6 is a perspective view of inner parts enclosed by the packaging system in fig 3,
 Fig 7 is a perspective view of inner parts enclosed by the packaging system in fig 2, and
 Fig 8 is a schematical top plan view in section showing the casing-like parts of the packaging system in figs 1-3.

Detailed Description of the Invention

[0040] Figs 1-5 and 8 illustrate a collapsible packaging system or concept 10 according to the invention comprising at least one packaging arrangement 100, 200 according to one embodiment of the invention (shown in Figs 6 and 7). The packaging arrangement 100, 200 comprises at least one tray in one embodiment, or, preferably, at least one pair of trays 101, 102, 103, 104, 203, 204 in another embodiment adapted to hold, stay, set, and/or orientate at least one component and/or a number of components 105, 205 (see fig 6) for storing and/or transport by means of the packaging system 10, and for providing individual mechanical protection at least partially for the component by means of load/force take-up, i.e. the tray absorbs/dampens/reduces/distributes loads and forces due to impacts, impulses from hits/blows during handling of the packaging system 10.

[0041] Preferably, the trays 101, 102, 103, 104, 203, 204 according to the invention are stackable but may also be nestable. The trays in one embodiment are stackable and/or nestable with components 105, 205 when loaded with components having a suitable configuration for achieving this. The trays in another embodiment are stackable and/or nestable without components 105, 205. The trays provide individual mechanical protection for each component, fully or partially. The trays may also be non-nestable in themselves. The trays may be used only as inserts, spacers, shims, interlayers, or fillers between

layers of components. The trays could also be provided with means, e.g. retractable yokes or brackets, making the trays stackable when pulled-out/extracted and nestable when pulled-in/retracted.

[0042] The stackable and/or nestable trays 101, 102, 103, 104, 203, 204 in one embodiment of the packaging system 10 are adapted to be stackable in a first state in which at least two adjacent trays have the same orientation in relation to each other and nestable in a second state in which one of the trays, e.g. the lower one, is kept in its first orientation while the other tray, e.g. the upper one, is turned, e.g. 180° in relation to the first tray, and then placed on the same for nesting/mating.

[0043] A first embodiment of the packaging system 10 according to the invention comprises at least two detachable and mating parts, i.e. at least one bottom part 223 in the form of a pallet and at least one tray 101, 102, 103, 104, 203, 204 placed on a loading surface 224 of the pallet 223. A second embodiment of the packaging system 10 comprises at least three detachable and mating parts, i.e. the pallet 223, at least one tray 101, 102, 103, 104, 203, 204, and at least one top part 221 in the form of a lid/cover. A third embodiment of the packaging system 10 comprises at least four detachable and mating parts, i.e. the pallet 223, at least one tray 101, 102, 103, 104, 203, 204, the lid 221, and at least one side wall 207. The side wall 207 is preferably split in two parts and upright/erected in a first state (see figs 1-3) for detachable connecting the pallet 223 to the lid 221 when the packaging system 10 is erected, and may optionally be removed or laid down (not shown) between the pallet 223 and the lid 221 in a second state inside an enclosure formed by the packaging system when collapsing it into a returnable empty (see fig 4-5).

[0044] The side wall 207 is foldable from its upright state into its lying-down state so that it fits inside the volume enclosed/defined by the pallet 223 and the lid 221 by being foldable/bendable along at least one fold or folding 110 extending vertically alongside the side wall 207, i.e. perpendicularly to the loading surface 224 of the pallet 223 when the side wall is upright (see fig 2) mating with the pallet and/or the lid. This means that, if the height of the packaging system 10 and the side wall 207 when erected is greater than the width of the pallet 223, the side wall can nevertheless be bent/folded into a size that fits inside the contour of the loading surface or volume for the pallet 223 by configuring the side wall 207 with one or more folds 110, so that it for example has a cross-section similar to a Z when folded.

[0045] The packaging system 10 according to the invention may instead of a divided side wall 207 be provided with a entire/whole/unbroken side wall 207, i.e. a non-divided side wall, a side wall being divided in more than two parts, or a side wall being divided perpendicularly to the shown vertical folds 110, i.e. horizontally. The side wall 207 may be provided with openings (not shown) being optionally covered by openable and/or lockable doors or hatches (not shown) for access to the interior of the

packaging system 10. These doors may be detachable.

[0046] The number of folds 110 to be used depend on the height, the width, and the length of the packaging system 10. The side walls 207 may be provided with one or more folds 110 extending essentially in parallel with the loading surface of the pallet 223, i.e. in the horizontal direction, if the height of the packaging system 10 is greater than the length of the pallet 223.

[0047] The pallet 223 and the lid 221 are configured for mating with the upright side wall 207 in the erected state and for mating with each other when the side wall is removed, or laid down folded and enclosed in the space between the pallet and the lid.

[0048] Fig 8 shows that the side wall 207 is divided into two sections 208 fitting with end edges into grooves around the periphery of the loading surface on the upper side of the pallet 223 and corresponding grooves (not shown) on the lower surface of the lid 221 facing the pallet. In this embodiment, each side wall section 208 is provided with three folds 110 extending vertically in fig 2. Two of the folds 110 primarily form two of the corners of the packaging system 10 while the third fold 110 is primarily used when folding the side wall 207. The two side wall sections 208 are symmetrical (in fig 8 only the folds 110 forming the four corners of the packaging system 10 are shown). The side wall sections 208 have overlapping or superimposing portions 206 adjacent two of the corners where the wall sections 208 are detachable joined together by means of hook-and-loop fastening means in the form of Velcro® fastening. The side wall sections 208 may also be detachable joined by any other suitable means, for example snap connections or push-/press buttons.

[0049] The packaging arrangement 100 is shown in figs 2, and 5-7 as one tray or a pair of trays 101, 102, 103, 104, 203, 204 for clarity reasons but may be a stack made up of only one tray or more than two sandwiched trays.

[0050] Fig 6 shows one embodiment of the packaging arrangement 100 according to the invention. The packaging arrangement 100 comprises a first upper tray 101 and a second lower tray 103. The trays 101, 103 are provided with at least one structure/pattern 109, in this case, structures/patterns 109 in the form of at least one depression and/or projection 109 that securely/steadily and accurately stay/hold and set one or more components 105. The structures 109 are configured in a suitable way for holding and setting components 105, 205 with corresponding configurations, e.g. to hold and set one or more uniformly shaped components 105, 205, or differently shaped components, at least partially, e.g. components having at least partially non-uniform shapes.

[0051] The trays 101, 103 shown in fig 6 may be configured with or without a ferrule, collar, or a flange 111 extending upwards and/or downwards similar to a skirt for at least partially enclosing each component 105, 205 for protecting the components from external effects or damage, e.g. dust, moisture/humidity, or mechanical in-

fluence, and providing strength, especially structural strength, structure and stability to the trays 101, 103. This collar 111 may in some cases be sufficient for protecting the components, whereby the need for the side wall 207 is eliminated.

[0052] The trays 101, 103 in fig 6 with components 105 can be stacked/piled/superimposed. The load supported by the packaging system/arrangement 10, 100 when stacking the trays 101, 103 may be carried only or at least partly by the components 105, or be carried only or at least partly by the tray collars 111 and/or the tray structures 109, or be carried mutually/jointly by the collars 111 and the components 105. The load may also only or at least partly be carried by the entire tray or trays 101, 103, i.e. the whole surface/structure forming the tray, e.g. as totally flat inserts/shims/sheets/plates.

[0053] The trays 101, 103 shown in fig 6 are preferably configured so that their upper sides position/place, orientate, protect, and, where appropriate, lock, preferably, the lower/bottom part of a component 105, e.g. a lower edge of the component, while the lower sides of the trays are locked/secured, preferably, against the upper part, e.g. an upper edge, of the underlying, i.e. the subjacent component/-s 105.

[0054] Moreover, the trays 101, 103 shown in fig 6 with their component holding structures 109 are nestable, i.e. the trays without any components 105 can be nested.

[0055] A second embodiment of the packaging arrangement 100, 200 is shown in fig 2. This second packaging arrangement 200 comprises at least one tray 203, preferably more than one tray (only one tray is shown for clarity reasons), having structures 209 in the form of depressions and/or projections 209. The structures 209 are designed to hold and set one or more components 205 in the same way as the structures 109 described earlier.

[0056] The packaging arrangement 200 in fig 2 is also provided with the wrapping side wall 207 and the lid 221 that provide additional protection of the trays 203 and the components 205 enabling further stacking of packaging arrangements 200 on top of each other. The packaging arrangement 200 is placed on a pallet 223 for easy handling thereof.

[0057] In fig 7, another embodiment of the packaging arrangement 100, 200 is shown with two layers/trays 101, 102, 103, 104, 203, 204, one upper tray 101, 103, 203 and one lower layer/tray 102, 104, 204 being either a separate loose layer or tray, a layer/tray detachably connected to the underside of the upper tray by means of Velcro®- or snap fastening, an integrated lower layer or section of the upper tray, or a layer/tray 102, 104, 204 permanently glued or fused to the underside and/or the upper side of the upper tray 101, 103, 203. Both the bottom and the top tray of a stack of trays may be provided with this adjoining layer/tray 102, 104, 204.

[0058] This lower tray 102, 104, 204 shown in fig 7 is at least partially compactible, compressible, or resilient for creating a dampening effect that eliminates or at least decreases any loads/jolts/impacts on the components

105, 205 when handling the packaging system/arrangement 10, 100. The lower tray 102, 104, 204 shown in fig 7 may be made of foamed, expanded, cellular, or aerated plastic, or a suitable type of rubber, or any other suitable material fulfilling the demands.

[0059] The compressible tray 102, 104, 204 shown in fig 7 can also be used as an optional filling up, if the height of the stack of components 105, 205 and trays 101, 103, 203 in the packaging system 10 is too low and a free space is created between the upper surface of the top tray and the underside of the lid 221 when put on top of the side walls 207, by laying one or more trays 102, 104, 204 in this free space or sandwich additional trays in the stack tray until this free space is filled up. The compressible trays 102, 104, 204 can also be used for "overfilling", i.e. stacking the trays at a height extending/protruding over the side wall 207 and then pressing the lid 221 on top of the stack, compressing the compressible trays 102, 104, 204 when strapping, i.e. tying the packaging system 10 creating an additional force that enhances the securing and locking of the pallet 223, the lid 221, the side walls 207, 208, the components 105, 205, and the trays 101, 102, 103, 104, 203, 204 in relation to each other, and minimizing any free space inside the packaging system 10.

[0060] Furthermore, the compressible tray 102, 104, 204 shown in fig 7 when used as a separate overfilling or filling up item does not have to be shaped as a tray or a flat/even sheet/plate, it may instead be shaped as a bag/sack filled with a gas, e.g. air, a fluid, e.g. a gel, beans, styrofoam pellets, or foam, or any other suitable form fulfilling the purpose.

[0061] In the collapsible packaging system/arrangement 10, 100, 200 according to the invention all of its parts, i.e. the pallet 223, the lid 221, the side walls 207, and the trays 101, 102, 103, 104, 203, 204 are preferably made of a suitable plastic material with sufficient durability. Optionally, at least one of the parts, 101, 102, 103, 104, 203, 204, 207, 221, 223 or, preferably all of the parts forming the packaging system 10 are made of a conductive and/or dissipative, sufficiently durable, and preferably recyclable material for protecting and/or shielding the components 105, 205 from electric pulses if the components are sensitive for static electricity.

[0062] The trays 101, 102, 103, 104, 203, 204 also provide possibilities for traceability of components 105, 205 and control of logistics and materials flow because the trays can carry information about the components, e.g. as engraved text, labels or RFID-tags. This is advantageous when a component is designed in such a way or has features that make it unsuitable or impossible for the component itself to carry/bring the information.

[0063] Furthermore, the trays 101, 102, 103, 104, 203, 204 also prevent, or at least render theft and manipulation of the components 105, 205 more difficult. The protection may be enhanced by various types of locking and sealing devices connected to the trays. The entire packaging system 10 may also be equipped with locking and sealing

devices for the lid 221, the side wall 207, and/or the pallet 223.

[0064] Moreover, the trays 101, 102, 103, 104, 203, 204 create a stable/sturdy packaging unit 100, 200 when stacked/nested that does not require any additional protection in itself but is rigid and stable enough to be provided with for example stretch film where the process of stretching the film may involve strong, or even heavy lateral/transverse forces/loads. This film also adds to the strength of the packaging unit 100, 200, and may be tightly attached/welded to at least one tray making vacuum packaging possible.

[0065] A stretch or shrink film forms an enhanced protection against for example contamination, soiling, moisture, and, depending on the choice of material, possibly against electrical impulses. The stretch/shrink film also provide some additional protection against theft and manipulation of the components 105, 205.

[0066] The stretch/shrink film also enables further improved traceability and control of logistics and materials flow because the film may carry information about the packaging system/arrangement 10, 100, 200 as a whole optimizing the amount of information providing control of more components 105, 205. This outer wrapping may also provide more comprehensive and detailed information about the content of the packaging unit since larger surfaces become available for application of for example labels.

[0067] Embodiments of the packaging system/arrangement 10, 100, 200 having outer protection, e.g. stretch/shrink film or walls 207, 208 and/or lids 221, are very advantageous in that the outer protection can be removed at the arrival or preparation position, and that the components 105, 205 and/or the trays 101, 102, 103, 104, 203, 204 entering a production area always are clean and dry, which is a great advantage for the users.

[0068] Moreover, the trays 101, 102, 103, 104, 203, 204, especially the compactible trays 102, 104, 204 are means for load take-up, and may, as explained earlier, be wholly or partially compressible by being provided with a compactible section that is integrated with the tray, the lid 221 and/or the pallet 223, detachable connected to one or more sides of the tray, e.g. the underside and/or the upperside in contact with the components, or detachable connected to the lid 221 and/or the pallet 223.

Claims

1. A collapsible packaging system (10) for storing at least one component (105, 205), comprising at least one bottom part (223), at least one top part (221), and at least one packaging arrangement (100, 200) when the packaging system (10) is used as a component storage, wherein the packaging arrangement (100, 200) for storing at least one component (105, 205), comprises at least one tray (101, 102, 103, 104, 203, 204) being adapted to hold and set the

component and to provide individual mechanical protection for at least parts of the component, and means (101, 102, 103, 104, 203, 204) for load take-up.

2. A collapsible packaging system (10) according to claim 1, wherein the tray (101, 102, 103, 104, 203, 204) is provided with at least one depression or at least one projection (109, 209), which at least partially enclose the component (105, 205).
3. A collapsible packaging system (10) according to any of the claims 1-2, wherein the tray (101, 102, 103, 104, 203, 204) is configured so that load is at least partially carried by the component (105, 205).
4. A collapsible packaging system (10) according to any of the claims 1-3, wherein the tray (101, 102, 103, 104, 203, 204) is configured so that load is at least partially carried by the tray.
5. A collapsible packaging system (10) according to any of the claims 1-4, wherein the component (105, 205) has a uniform shape.
6. A collapsible packaging system (10) according to any of the claims 1 to 4, wherein the component (105, 205) has an at least partially non-uniform shape.
7. A collapsible packaging system (10) according to any of the preceding claims, comprising at least one pair of trays (101, 102, 103, 104, 203, 204) that are stackable.
8. A collapsible packaging system (10) according to claim 7, wherein the trays (101, 102, 103, 104, 203, 204) are nestable.
9. A collapsible packaging system (10) according to any of the preceding claims, wherein at least one tray (101, 103, 203) or the means (102, 104, 204) for load take-up is at least partially made of a dissipative and/or conductive material for protecting the component (105, 205) from electric pulses.
10. A collapsible packaging system (10) according to any of the claims 1-9, wherein at least one tray (101, 103, 203) is at least partially compactible.
11. A collapsible packaging system (10) according to any of the claims 1-9, wherein the means (102, 104, 204) for load take-up is at least partially compactible.
12. A collapsible packaging system (10) according to claim 10, wherein the tray (101, 103, 203) comprises a compactible section (102, 104, 204).
13. A collapsible packaging system (10) according to

claim 10, wherein the means (101, 102, 103, 104, 203, 204) for load take-up comprises a compactible section (102, 104, 204).

- 5 14. A collapsible packaging system (10) according to claim 12 or 13, wherein the compactible section (101, 102, 103, 104, 203, 204) is made of foamed, expanded, cellular, or aerated plastic, or rubber.
- 10 15. A collapsible packaging system (10) according to any of the claims 1-14, wherein at least one tray (101, 102, 103, 104, 203, 204) is provided with a skirt-like peripheral edge.
- 15 16. A collapsible packaging system (10) according to claims 1-15, further comprising at least one side wall (207) for connecting the bottom part (223) to the top part (221) and for at least partially enclosing the packaging arrangement (100, 200) when the packaging system (10) is used as a component storage.
- 20 17. A collapsible packaging system (10) according to any of the claims 1-16, wherein the side wall (207) is detachable connected to the packaging system (10) and adapted to fit between the bottom part (223) and the top part (221) when the packaging system is erected and/or when it is collapsed.
- 25 18. A collapsible packaging system (10) according to any of the claims 1-17, wherein the side wall (207) is bendable so that it fits inside an enclosure defined by the bottom part (223) and the top part (221) when the packaging system (10) is erected and/or when it is collapsed.
- 30 19. A collapsible packaging system (10) according to claim 18, wherein the side wall (207) is bendable along at least one fold (110) extending alongside the side wall.
- 35 20. A collapsible packaging system (10) according to claim 19, wherein the side wall (207) is bendable along at least one fold (110) extending vertically or horizontally alongside the side wall.
- 40 21. A collapsible packaging system (10) according to claim 19, wherein the side wall (207) is bendable along at least one fold (110) extending vertically alongside the side wall and at least one fold extending horizontally alongside the side wall.
- 45 22. A collapsible packaging system (10) according to any of the claims 1-21, wherein the side wall (207) is formed by one or more sections.
- 50 23. A collapsible packaging system (10) according to any of the claims 1-22, wherein at least one of the parts (101, 102, 103, 104, 203, 204, 221, 223) form-
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ing the packaging system (10) is at least partially made of a dissipative and/or conductive material for protecting the component (105, 205) from electric pulses.

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- 24.** A collapsible packaging system (10) according to any of the claims 1-22, wherein all of the parts (101, 102, 103, 104, 203, 204, 207, 221, 223) forming the packaging system (10) are at least partially made of a dissipative and/or conductive material for protecting the component (105, 205) from electric pulses.

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- 25.** A collapsible packaging system (10) according to any of the claims 1-24, wherein the bottom part (223) and the top part (221) are configured for mating with the side wall (207) when the packaging system (10) is erected and for mating with each other when the packaging system is collapsed.

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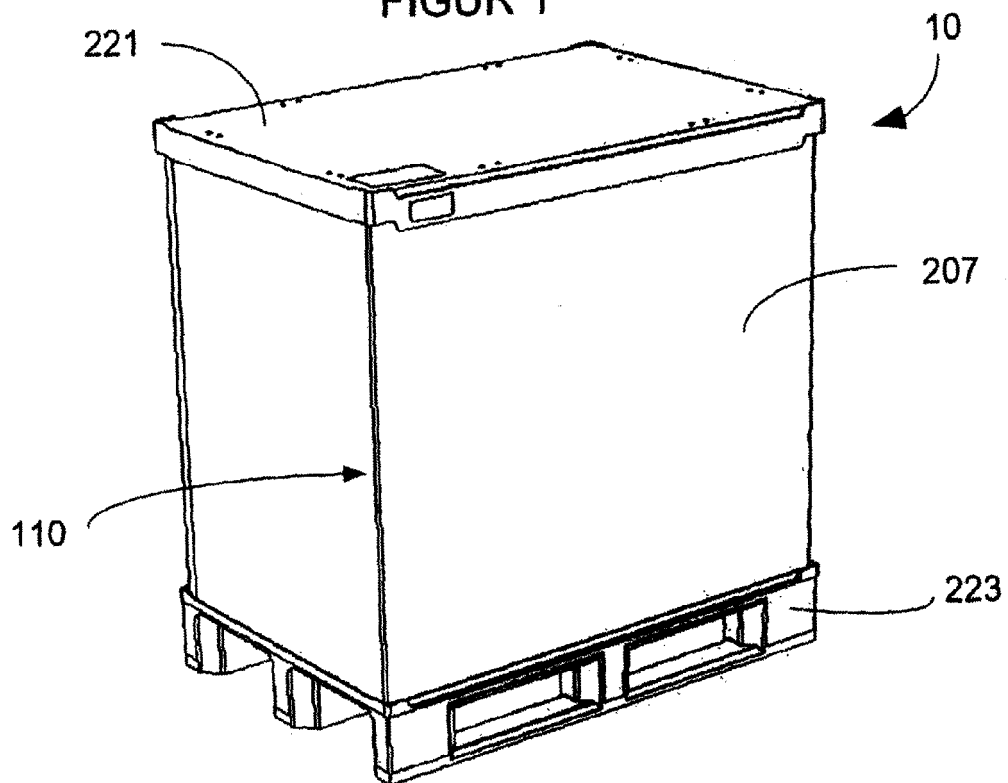
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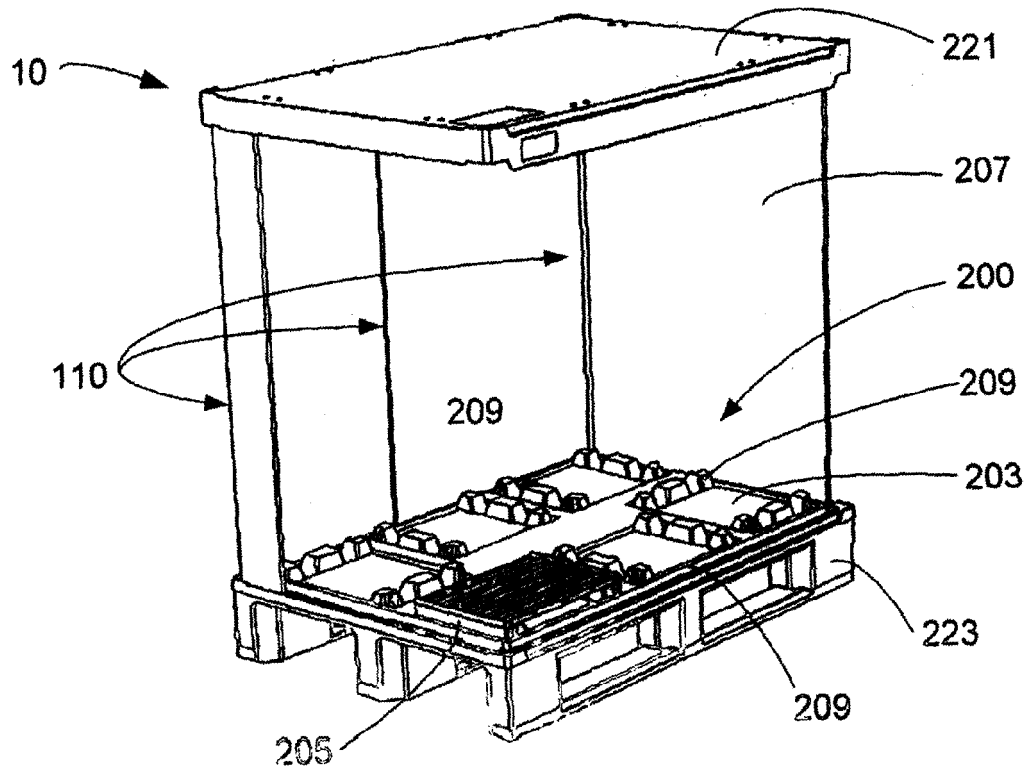
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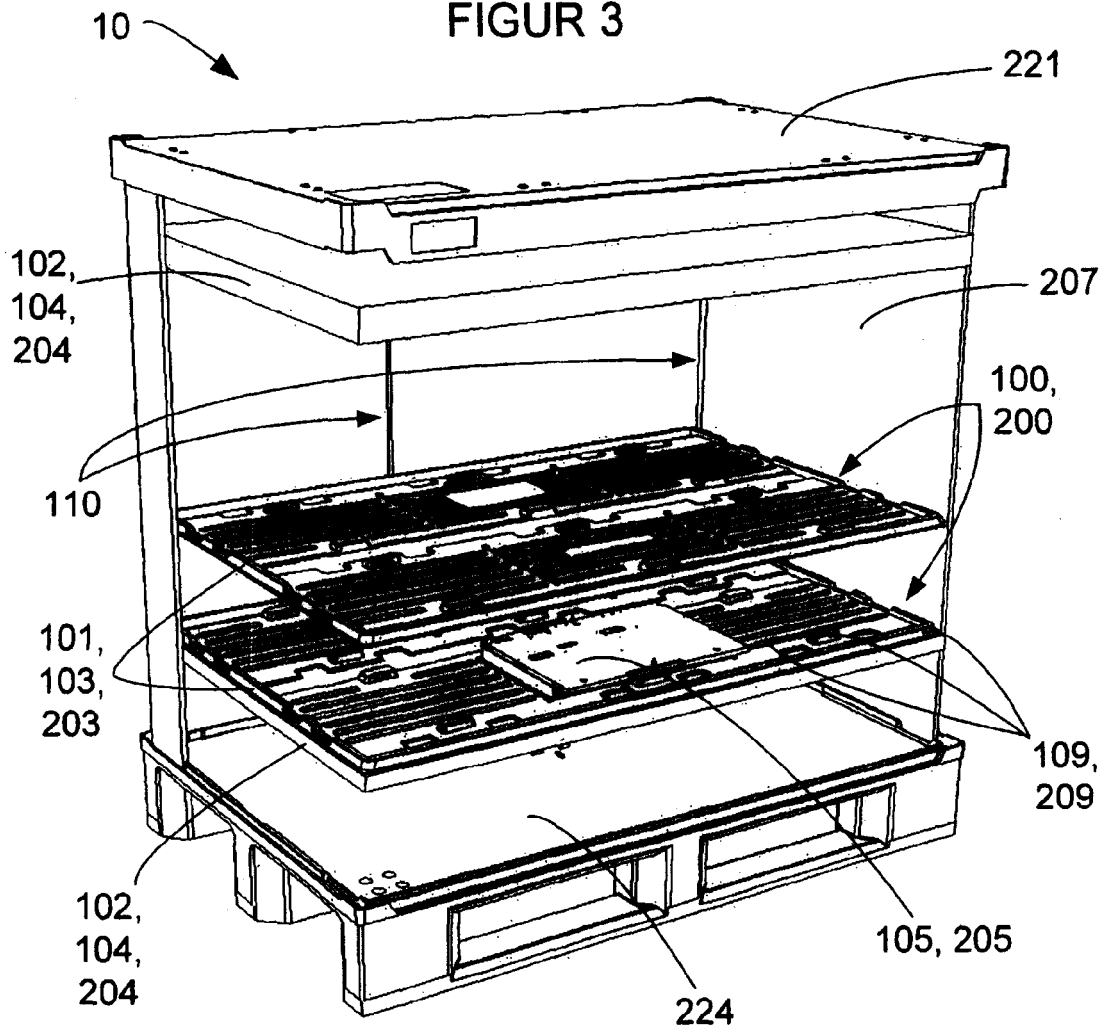
FIGUR 1



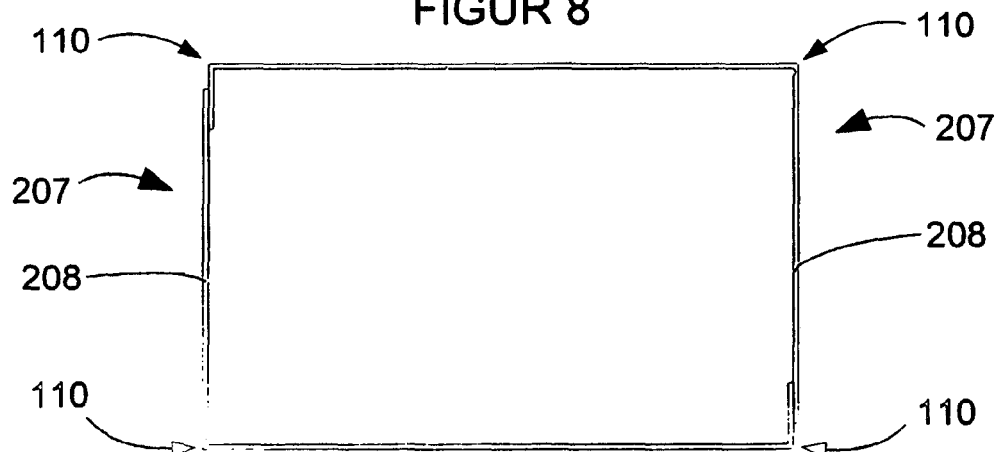
FIGUR 2



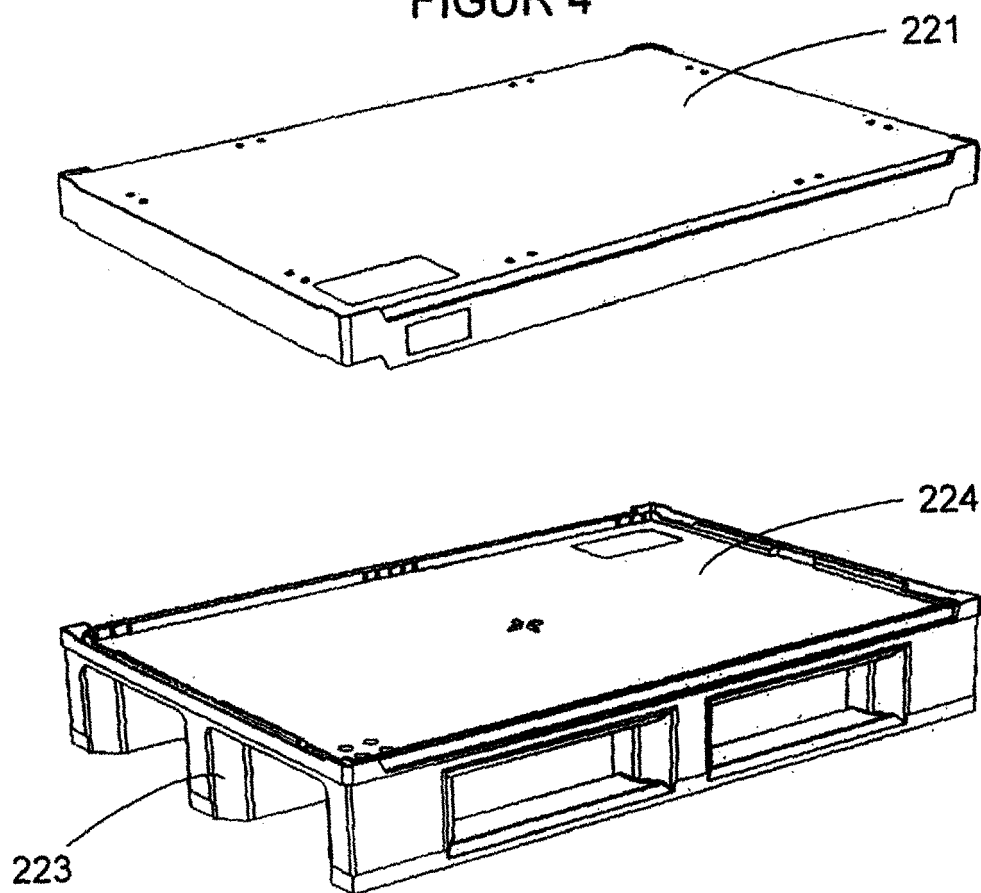
FIGUR 3



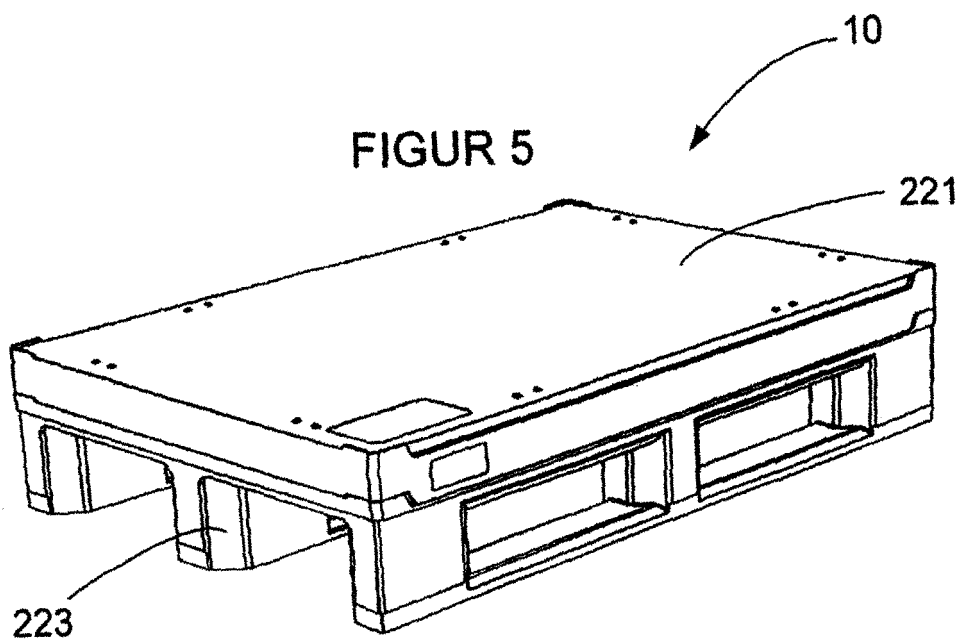
FIGUR 8

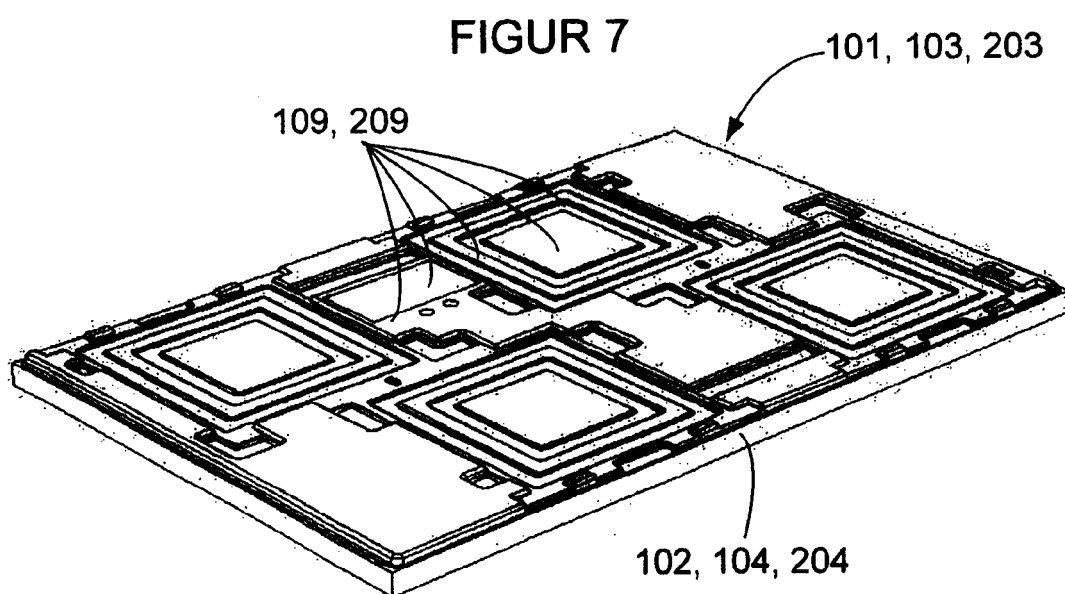
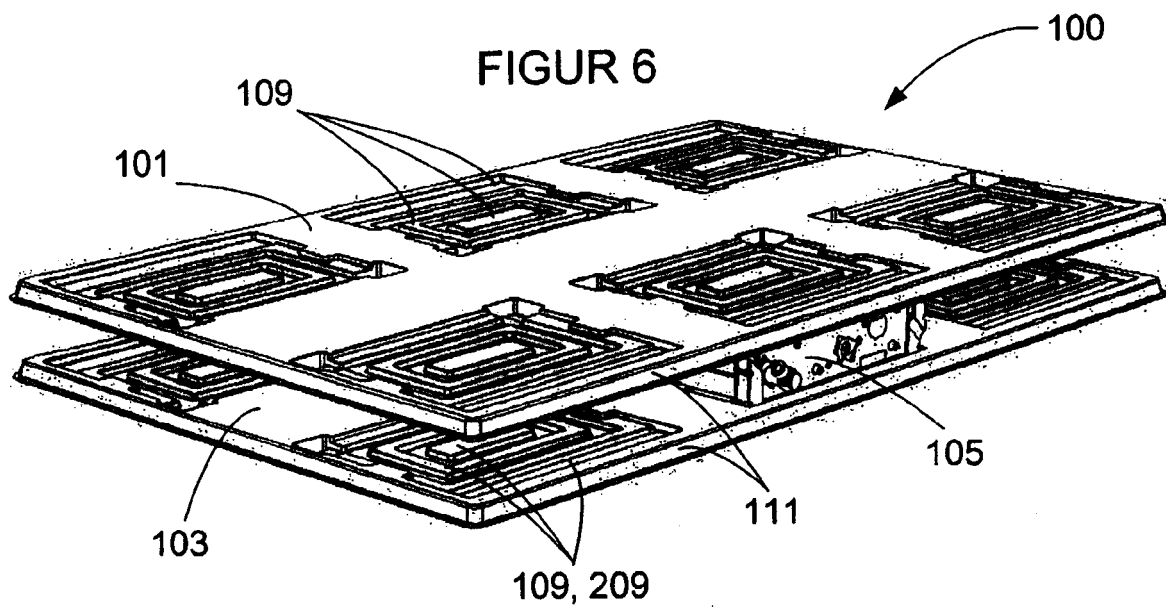


FIGUR 4



FIGUR 5





REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4580680 A [0003]