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(54) **Pallet**

(57) Pallet comprising a loading deck (1) supported by at least one support foot (7), wherein the loading deck (1) comprises a number of tubes (2) positioned adjacent each other and fixedly connected to each other in longi-

tudinal direction of the tubes (2) and stiffening means (5) at least partially connected to the tubes (2) for providing stiffness to the loading deck (1) in a direction transverse to the longitudinal direction of the tubes (2).

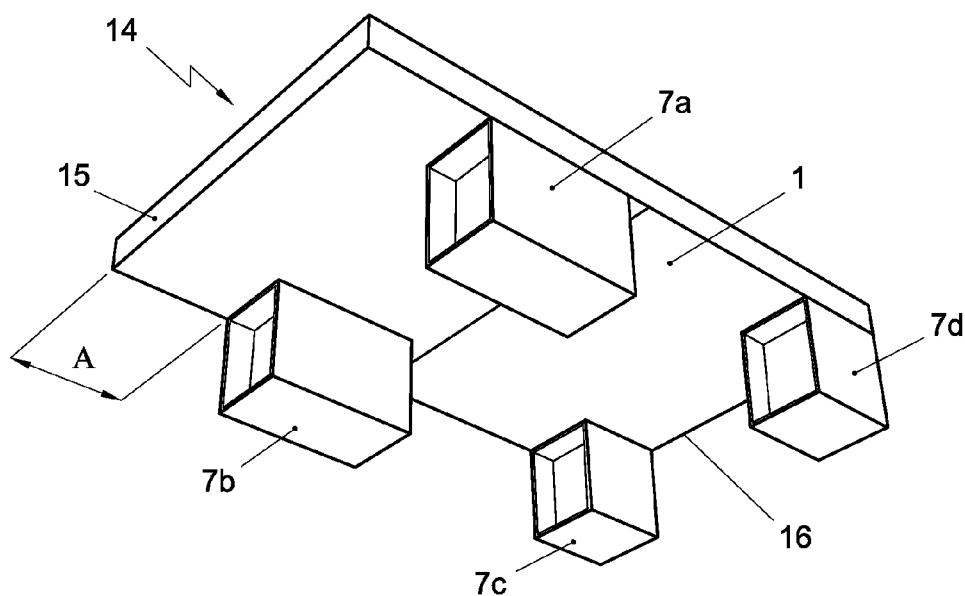


Fig. 3

Description

[0001] The invention relates to a pallet.

[0002] Pallets are known for transporting goods and manufactured of various materials. Wooden pallets, composite pallets or cardboard pallets are available and widely used. Pallets are preferably light weight and easy to handle while being sufficiently stiff and strong to carry the load. Preferably, pallets can be manufactured relatively cost effective. Wooden pallets can be relatively heavy and difficult to handle. Composite pallets can be relatively heavy, complex to manufacture and relatively expensive. Cardboard pallets may be relatively complex and may encounter strength problems.

[0003] An object of the invention is therefore to provide a pallet that obviates at least one of the above mentioned drawbacks. An object of the invention is to provide a relatively simple and reliable pallet.

[0004] Thereto, the invention provides a pallet comprising a loading deck supported by at least one support foot, wherein the loading deck comprises a number of tubes positioned fixedly connected to each other in longitudinal direction of the tubes and stiffening means at least partially connected to the tubes for providing stiffness to the loading deck in a direction transverse to the longitudinal direction of the tubes.

[0005] By providing a loading deck comprising a number of tubes fixedly connected to each other to provide a substantially flat load carrying side, a cost effective loading deck can be obtained, thereby rendering the pallet cost effective as well. The tubes are preferably hollow tubes at least partially connected to each other over the length of the tubes.

[0006] By additionally providing stiffening means that are at least partially connected to the tubes a reliable loading deck can be obtained that is sufficiently stiff and sufficiently strong.

[0007] The hollow tubes are preferably rectangular so the tubes can be positioned relatively easily adjacent each other. Also, the tubes can be fastened relatively easily to each other along their longitudinal sides. Fastening the tubes to each other can be done by any known fastening means, such as screwing or bolting, although gluing may be advantageous.

[0008] The stiffening means can be at least partially fastened to the tubes to provide for sufficient stiffness and strength. Advantageously, the stiffening means are a deck sheet that is at least partially wrapped around the tubes in longitudinal direction of the tubes. By wrapping the deck sheet in longitudinal direction around the tubes, stiffness in transverse direction can be obtained. In addition, the deck sheet adds to the strength of the loading deck. By wrapping the deck sheet at least partially around the tubes, the open ends of the tubes can be closed off thereby it can be avoided that moist and/or dirt can enter the tubes.

[0009] In a preferred embodiment, the deck sheet is wrapped around the tubes in longitudinal direction of the

tubes such that opposite ends of the deck sheet approximately abut against each other when wrapped around the tubes. By fully enclosing the tubes in their longitudinal direction optimal strength and stiffness of the loading deck can be obtained in a relatively simple way. The deck sheet can be at least partially fastened to the tubes, for example by gluing to secure the deck sheet to the tubes and to provide a firm loading deck.

[0010] Advantageously, the at least one support foot or support feet are fastened to the loading deck with a longitudinal side of the support foot. The support foot preferably has a rectangular cross-section such that a longitudinal side can be relatively easily fastened to the loading deck. By fastening a longitudinal side of the support foot to the loading deck, failure of the support foot, e.g. by buckling can be obviated, and a more strong support can be obtained.

[0011] At least one open end of the tube, but advantageously both open ends of the tube of the support foot are preferably closed by a closing sheet that is positioned inside the tube. The closing sheet is preferably sufficiently stiff and strong to accommodate in carrying the support force by the support foot. By placing the closing sheet inside the tube, a support foot can be obtained that is free from external protrusions or obstructions, so a smooth support foot can be obtained. Furthermore, by placing the closing sheet inside the tube, the closing sheet may prevent torsion and/or warping of the support foot.

[0012] By providing the closing sheet with flanges that are adapted for fastening the flanges to the inner sides of the support tube, a relatively easy fastening of the closing sheet to the inner sides and at the inside of the support tube can be obtained.

[0013] In an advantageous configuration, at least one support foot is positioned near a short side of the loading deck and at least one support foot is positioned at a distance of an opposite short side of the loading deck. Thus a configuration of support feet is provided allowing easy access of the pallet by hand truck or any other pallet transporting device.

[0014] In an advantageous embodiment, the pallet is manufactured substantially of cardboard material. Any connections between tubes and/or sheets are then advantageously obtained by gluing. In the context of this specification, cardboard is meant to understand any variant of material containing paper and/or paper fibres.

[0015] The invention further relates to a set of tubes and a wrapping sheet, and to a set of a support tube and at least one closing sheet.

[0016] The loading deck itself and the support foot itself can be considered as inventions on their own.

[0017] Further advantageous embodiments are represented in the dependent claims.

[0018] The invention will further be elucidated on the basis of exemplary embodiments which are represented in a drawing. The exemplary embodiments are given by way of non-limitative illustration of the invention.

[0019] In the drawing:

Fig. 1a shows a schematic perspective view of an embodiment of a loading deck according to the invention;

Fig. 1b shows an exploded view of the loading deck of Fig. 1b;

Fig. 2 shows an exploded view of an embodiment of a support foot according to the invention; and

Fig. 3 shows a schematic perspective view of an embodiment of a pallet according to the invention.

[0020] It is noted that the figures are only schematic representations of embodiments of the invention that are given by way of non-limiting example. In the figures, the same or corresponding parts are designated with the same reference numerals.

[0021] Figure 1 shows a loading deck 1 according to the invention. In the embodiments shown, pallet, loading deck and support feet are manufactured from cardboard, which is relatively cost effective, relatively easy to handle and process. Of course, any other material may be used.

[0022] The loading deck 1 comprises a number of tubes 2 positioned adjacent each other. Here the tubes 2 have a rectangular cross-section and are fastened to each other with their short longitudinal sides. By positioning the tubes 2 adjacent each other, a substantially flat plate-like body 4 can be obtained that is relatively stiff in its longitudinal direction. The tubes 2 are fastened to each other by gluing, for example a 'cold glue' can be used.

[0023] By further providing a deck sheet 5 that can be wrapped around the tubes 2 in longitudinal direction of the tubes, additional strength and stiffness in a direction transverse to the longitudinal direction of the plate body 4 can be obtained. The deck sheet 5 is at least partially wrapped around the tubes 2, but preferably the deck sheet 5 is fully wrapped around the tubes 2, as can be seen in Fig. 1a. The deck sheet 5 is then wrapped around the tubes 2 such that opposite ends 5a, 5b of the deck sheet 5 abut against each other when wrapped around the tubes 2. The deck sheet 5 is here provided as a sheet of cardboard with folding lines 11 along which the sheet can be folded for wrapping it around the tubes 2.

[0024] By wrapping the deck sheet 5 around the tubes 2, open ends 6 of the tubes 2 can be closed such that entering of dirt and/or moist into the tubes 2 may be minimized.

[0025] Advantageously, the deck sheet 5 is fastened to the tubes 2, preferably by gluing, such that a firm connection between the deck sheet 5 and the tubes 2 can be obtained to optimize the load carrying capacity of the loading deck 1.

[0026] Fig. 2 shows a support foot 7 for supporting the loading deck 1. The support foot 7 comprises a support tube 8 that in this example is a hollow tube with a rectangular cross-section. Two closing sheets 9 close open ends 10 of the tube 8. The closing sheets 9 are positioned inside the support tube 8, as can be seen in Fig. 3. The

closing sheets 9 are placed inside the support tube 8 near the ends of the support tube 8. Thereto, the closing sheets 9 are provided with flaps 12 that are adapted to be fastened against inner walls of the tube 8. The flaps 12 can for example be glued to the inner walls of the tube 8. The closing sheet 9 is here provided with folding lines 13 for facilitating folding of the flaps 13.

[0027] The loading deck 1 can be provided with at least one support foot 7 to form a pallet 14. In the embodiment shown in Fig. 3, the loading deck 1 is provided with four support feet 7. The support feet 7 are fastened to the loading deck 1 with a longitudinal side 8a. Preferably, the support foot 7 is glued to the loading deck 1. By fastening the support foot 7 to the loading deck 1 with the longitudinal side 8a, a relatively large contact area between the loading deck 1 and the support foot 7 can be obtained for an optimal force transferring area. The closing sheet 9 may prevent the support foot 7 from warping or torsion and may contribute in carrying the load forces.

[0028] In the embodiment shown in Fig. 3, two support feet 7a, 7b are positioned at a distance A from a short end 15 of the loading deck 1. Two support feet 7c, 7d are positioned approximately near an opposite short end 16 of the loading deck 1. By positioning the supporting feet 7 in such a configuration, a configuration is obtained that allows relatively easy handling of the pallet 14 by for example a hand truck or other pallet transporting device.

[0029] Many variants will be apparent to the person skilled in the art. The stiffening means can for example be a support foot that is placed in transverse direction with respect to the tubes. The support foot may then extend over the width of the tubes and thus the width of the loading deck. The stiffening means may for example be a sheet that is positioned on top of the tubes to form a load carrying surface and/or a sheet that is positioned at the bottom of the tubes to form a support surface for connection with a support foot. The stiffening means may also comprise strips of material fastened to the tubes in transverse direction of the tubes. All variants are understood to be comprised within the scope of the invention as defined in the following claims.

Claims

1. Pallet comprising a loading deck supported by at least one support foot, wherein the loading deck comprises a number of tubes positioned adjacent each other and fixedly connected to each other in longitudinal direction of the tubes and stiffening means at least partially connected to the tubes for providing stiffness to the loading deck in a direction transverse to the longitudinal direction of the tubes.
2. Pallet according to claim 1, wherein the stiffening means comprises a deck sheet at least partially wrapped around the tubes in longitudinal direction of the tubes.

3. Pallet according to claim 1 or 2, wherein the deck sheet is wrapped around the tubes such that opposite ends of the deck sheet abut against each other when wrapped around the tubes. 5
4. Pallet according to any one of the preceding claims, wherein adjacent tubes are fastened to each other by gluing. 10
5. Pallet according to claim 3 or 4, wherein the deck sheet is fastened to the tubes by gluing. 15
6. Pallet according to any one of the preceding claims, wherein the tubes have a rectangular cross-section. 20
7. Pallet according to any one of the preceding claims, wherein the support foot is fastened to the loading deck with a longitudinal side of the support foot. 25
8. Pallet according to claim 7, wherein the support foot comprises a support tube of which at least one open end is closed by a closing sheet placed inside the tube. 30
9. Pallet according to claim 8, wherein opposite open ends of the support tube are closed by a closing sheet placed inside the tube. 35
10. Pallet according to claim 8 or 9, wherein the closing sheet comprises flanges adapted for fastening the flanges to the inner sides of the support tube. 40
11. Pallet according to any one of claims 8 - 10, wherein the closing sheet is connected inside the tube by gluing. 45
12. Pallet according to any one of claims 7 - 11, wherein the support tube has a rectangular cross-section. 50
13. Pallet according to any one of the preceding claims, wherein at least one support foot is positioned near a short side of the loading deck and wherein at least one support foot is positioned at a distance of an opposite short side of the loading deck. 55
14. Pallet according to any one of the preceding claims, wherein the pallet is substantially manufactured of cardboard material.
15. A set of tubes and a wrapping sheet, wherein the wrapping sheet comprises fold lines for folding the sheet along these lines for allowing wrapping of the sheet around the tubes.
16. A set of a support tube and at least one closing sheets, wherein the cardboard closing sheets are provided with fold lines for folding a flange along these lines.

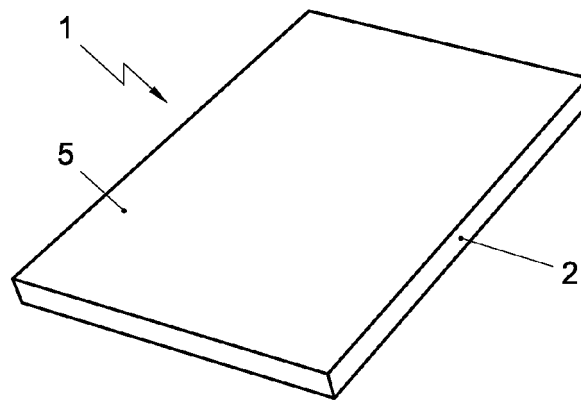


Fig. 1a

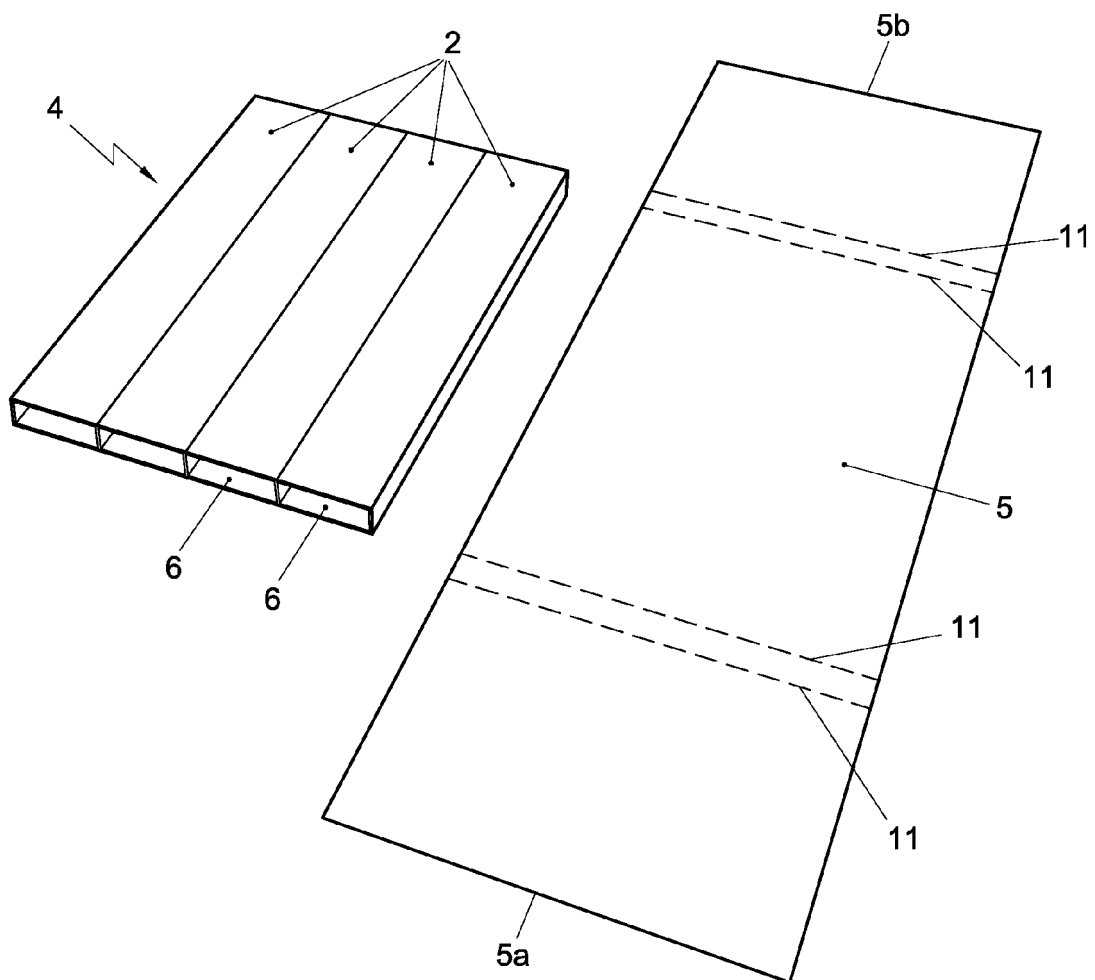


Fig. 1b

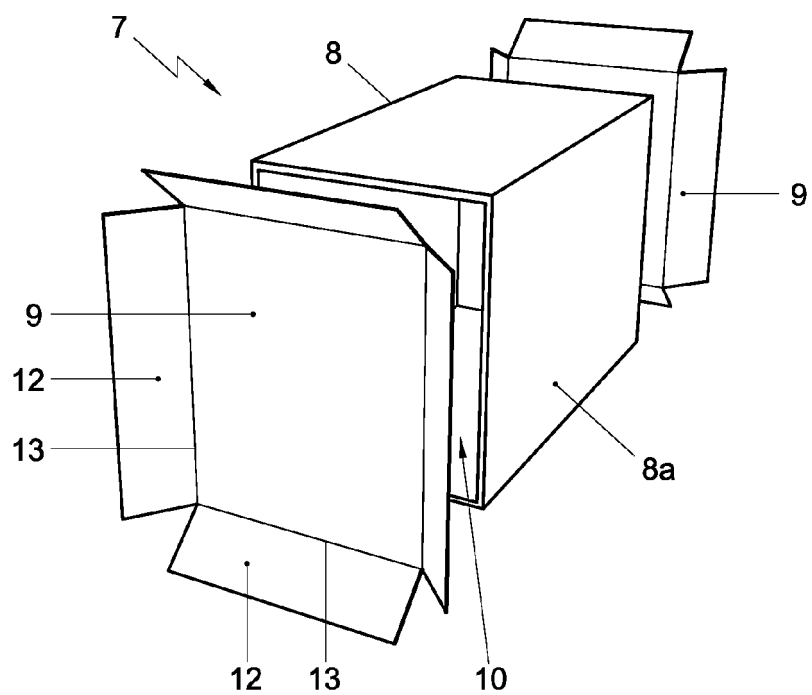


Fig. 2

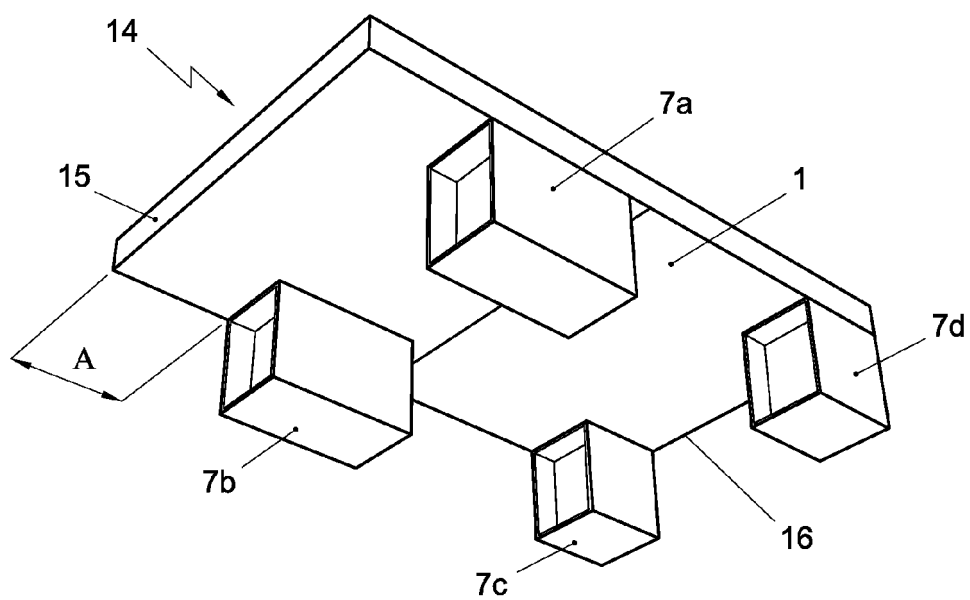


Fig. 3



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Application Number
EP 11 19 3000

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| Place of search Munich | | Date of completion of the search 24 February 2012 | Examiner Fitterer, Johann |
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EPO FORM 1503 03.82 (P04C01)



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| <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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