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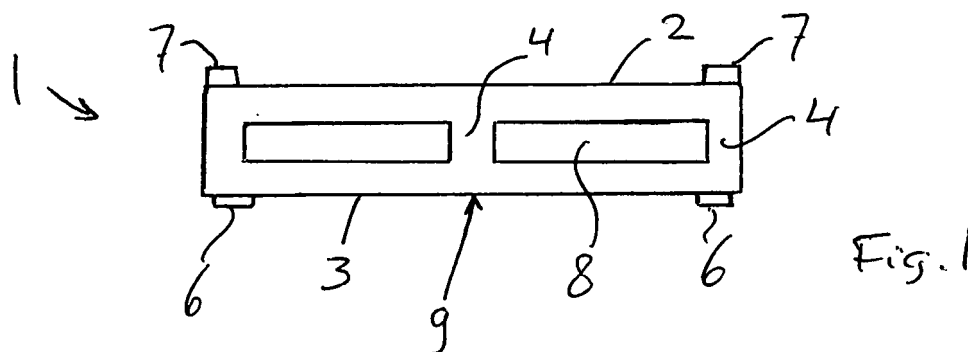
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(54) **Pallets having positioning elements**

(57) A plastic pallet (1) has an upper deck (2), a lower deck (3) and support elements (4) connecting the decks. The underside (9) of the lower deck is provided with positioning elements, such as curved protrusions and/or

recesses, for positioning casks or barrels of a lower pallet in a stack. The lower deck (3) is further provided with protection elements (6) which in use extend below the positioning elements in the underside of the lower deck.



## Description

**[0001]** The present invention relates to pallets or like platforms, with or without side walls, for supporting loads to be lifted or lowered. More in particular, the present invention relates to a pallet formed of a plastic material and provided with a substantially planar deck for carrying articles and support elements for supporting the deck. The support elements of a pallet are typically spaced in such a way that the prongs of a forklift may be received between them, thus enabling the forklift to lift and carry the pallet and its load.

**[0002]** Traditionally, pallets were made of wood, providing sufficient friction between the pallet deck and the objects it carried. This allowed a pallet carrying a load, for example metal casks, to be stacked on a similar pallet also carrying a load, and to lift and transport the stacked pallets, as both the pallet carrying the casks and the pallet covering the casks would provide friction and prevent any movement of the casks. Modern pallets, however, are made of plastic materials, such as HDPE (high density polyethylene) or similar materials, which provide less friction, in particular relative to metal.

**[0003]** European Patent Application EP 1 440 893 A2 (D W Plastics) discloses a plastic pallet having an upper deck and a lower deck. The upper deck is provided with friction elements, such as rubber studs, for increasing the friction between the pallet and the prongs of a fork lift, and positioning elements (raised areas) for positioning casks or barrels. Rubber studs are very useful for preventing any slipping of the prongs of a fork lift, but are less suitable for preventing movement of the load, as they are easily damaged, in particular when the load includes heavy objects. The raised deck areas assist in preventing any sliding of the casks, but their preventive action is limited to the bottom parts of the casks, as no positioning elements for positioning the top parts of the casks are disclosed.

**[0004]** It has been proposed to provide the bottom surface of a pallet with load stabilising structures or positioning elements, such as recesses or protrusions, which are designed to co-operate with the rims of casks or other objects carried by a lower pallet in a stack. British Patent Application GB 2 175 878 A (Diamonite Products), for example, discloses a single-deck plastic pallet provided with recesses in its lower surface for receiving the rim flanges of barrels. However, this known pallet is not suitable for use with a fork lift as it has no support elements.

**[0005]** A beer keg pallet which is suitable for use with a fork lift is disclosed in United States Patent US 3 995 749 (Johns-Manville Corp.). The single-deck plastic pallet is provided with support elements shaped to receive the top parts of beer kegs between them. In other words, the support elements also serve as positioning elements. This is only possible because this known pallet has no lower deck.

**[0006]** In a plastic pallet having both an upper deck and a lower deck, such as the pallet disclosed in EP 1

440 893 A2 discussed above, it is often also desirable to provide structures for stabilizing the load of the immediately lower pallet in a stack of pallets. It has been proposed to provide (curved) protrusions and/or recesses in the underside of the lower deck to receive the rim or another part of a cask and thus prevent any shifting or toppling of the cask. However, it has been found that such structures are easily damaged and/or wear off in use and lose their efficacy.

**[0007]** It is an object of the present invention to overcome these and other problems of the Prior Art and to provide a plastic pallet provided with positioning elements in its lower deck, which positioning elements are protected against wear and damage.

**[0008]** Accordingly, the present invention provides a plastic pallet having an upper deck, a lower deck and support elements connecting the decks, the underside of the lower deck being provided with positioning elements, characterised in that the lower deck is further provided with protection elements which in use extend below the positioning elements.

**[0009]** By providing protection elements which protrude, in use, downward from the lower surface of the lower deck, beyond the positioning elements, wear and damage to the positioning elements can be effectively prevented as these protruding protection elements will typically rest on the ground if the pallet is placed on the ground when not stacked, thus leaving some space between the ground and the underside of the pallet. This space or clearance may range from a few millimetres to a few centimetres. By substantially avoiding direct contact between the ground and the positioning structures of the lower deck, these structures can remain effective for the entire service life of the pallet.

**[0010]** It is preferred that the protection elements are arranged near the corners of the pallet. This ensures that the pallet is stable when resting on the protection elements. The protection elements may be arranged at the corners, or slightly spaced from the corners. The arrangement of the protection elements should not interfere with the positioning structures.

**[0011]** In an advantageous embodiment the protection elements are made of a wear-resistant material, preferably a reinforced material such as a wear-resistant rubber compound. The protection elements may advantageously be made of a composite material, for example a material comprising glass fibres. Such a composite material may, for example, comprise HDPE or polypropylene.

**[0012]** In a further advantageous embodiment the protection elements are constituted by blocks, and preferably the underside of the lower deck is provided with recesses adapted to receive said blocks. By providing recesses in the lower deck, the protection elements can be securely mounted on the underside of the lower deck, removing any possibility of sliding of the protection elements. It will be understood that the said recesses have a smaller height than the protection elements, so as to ensure that the protection elements protrude from the

recesses.

**[0013]** Instead of separately manufactured protection elements which are mounted on the pallet, it is also possible to use protection elements which are integral with the lower deck. In fact it is possible for the pallet to be fully integral, that is, to consist of a single piece, including the positioning structures and the protection elements.

**[0014]** The pallet of the present invention advantageously also comprises positioning elements on the upper deck. This allows a secure positioning of casks, barrels and similar objects in a stack of loaded pallets.

**[0015]** The present invention also provides a protection element for use in the pallet defined above.

**[0016]** The present invention will further be explained below with reference to exemplary embodiments illustrated in the accompanying drawings, in which:

Fig. 1 schematically shows, in side view, a pallet according to the present invention.

Fig. 2 schematically shows, in bottom view, the lower deck of the pallet of Fig. 1.

Fig. 3 schematically shows, in cross-sectional view, a corner section of the pallet of Fig. 1.

**[0017]** The pallet 1 according to the present invention shown merely by way of nonlimiting example in Fig. 1 is formed of a plastic material, such as HDPE (high density polyethylene) or any other suitable plastic material.

**[0018]** As illustrated in Fig. 1, the pallet 1 includes a top or upper deck 2 and a bottom or lower deck 3 which both have an upper surface and a lower surface. The decks 2 and 3 preferably have a rectangular shape with rounded corners, but may also take other shapes, including but not limited to a square, circular, triangular or other shapes as desired or required by the use and application. The pallet 1 is preferably approximately symmetrical about at least one centreline. The upper surface of top deck 2 is preferably a substantially planar surface on which articles (not shown) can be carried. However, in the embodiment shown the top deck 2 has raised areas 7 at the corners which may assist in positioning the articles. In addition, other selected areas of the upper surface may be slightly raised to provide positioning elements. In the example shown, the positioning elements 7 are arranged for positioning kegs, e.g. beer kegs, but it will be understood that other arrangements can be made to position other articles.

**[0019]** Top deck 2 and bottom deck 3 are connected by support elements 4, which preferably are integral with both decks. Between the support elements 4 apertures 8 are capable of accepting the prongs of a forklift or similar device (not shown).

**[0020]** The top deck 2 and/or the bottom deck 3 may be constituted by a structure of interconnected ribs. Such an open structure is very strong yet light. In addition, an open structure allows the pallet 1 to be thoroughly cleansed.

**[0021]** The lower deck of the pallet of the present in-

vention is provided with further positioning elements (5 in Figs. 2 and 3) for positioning the top parts of casks or other objects on which the pallet 1 may rest when loaded pallets are stacked. When handling a stack of loaded pallets with a fork lift or other apparatus, it is essential that the load (e.g. casks) does not slide or topple. To ensure a stable stack of pallets, positioning elements 7 position the objects loaded on the top deck 2 of the pallet 1, while further positioning elements (5 in Figs. 2 & 3) position the objects of the pallet below, on which objects the pallet 1 rests when stacked.

**[0022]** In accordance with the present invention, protection elements 6 are mounted on the underside 9 of the lower deck 3. These protection elements, which will later be discussed in more detail with reference to Figs. 2 and 3, protrude below the lower deck 3 and thereby essentially prevent any contact between the lower deck 3 and the ground on which the pallet 1 may rest. The protection elements 6 provide a clearance ranging between approximately 1 mm and 50 mm, and serve to protect the positioning elements against damage and wear.

**[0023]** The positioning elements 5 are shown more clearly in the bottom view of Fig. 2, which shows the underside 9 of the lower deck 3. In the embodiment shown, the positioning elements 5 are constituted by substantially circular recesses (grooves) which are designed for receiving the rims of casks. These recesses may have a depth of between 2 mm and 50 mm. To avoid the edges of these positioning recesses 5 being damaged, they are effectively lifted off the ground by the protection elements 6, which protrude from the surface of the underside 9.

**[0024]** In the embodiment shown, four protection elements 6 are present, located near the corners of the pallet 1. However, the number of protection elements is not limited to four and other numbers may also be used, for example six, eight or twelve. The protection elements 6 stay clear of the recesses 5. Instead of or in addition to recesses, protruding edges could be used, provided these edges do not protrude beyond the protection elements 6. Such edges are preferably integral with the lower deck 3.

**[0025]** In the cross-sectional view of Fig. 3 a positioning recess 5 in the underside 9 of the lower deck 3 is shown. Next to the recess 5 a protection element 6 is located, near the corner of the pallet. The protection element 6 is shown to extend below the underside 9 of the lower deck 3 so as to provide a clearance.

**[0026]** In the embodiment shown, the protection elements 6 are mounted on a level surface of the lower deck 3, for example by means of suitable glue or screws. In other embodiments (not shown) recesses may be provided to partially receive the protection elements. Such mounting recesses may have a depth ranging from 1 mm to 50 mm or more and serve to avoid any horizontal movement of the protection elements. Of course the depth of the mounting recesses is chosen such that the protection elements 6 protrude from the mounting recesses.

[0027] The mounting recesses are preferably spaced apart from the positioning recesses 5, although in some embodiments combined positioning and mounting recesses may be provided. It is noted that Figs. 1, 2 and 3 are not drawn to the same scale.

[0028] The pallet of the present invention is suitable for carrying barrels, kegs, casks, flasks, boxes, and other objects.

[0029] The pallet according to the present invention is preferably formed of a thermoplastic or other polymeric material and is preferably, but not necessarily, formed by an injection moulding process. Engineered materials may be used, as well as a synthetic resin such as polyethylene or polypropylene with a filler added to stiffen the resin. It is contemplated that the pallet of the present invention may be manufactured by various other moulding techniques and manufacturing processes applicable to the design and material selected, including but not limited to blow moulding, thermoforming, vacuum moulding, etc. It is further contemplated that the material from which the pallet according to the present invention is formed may include materials other than plastics and polymer blends, and may include metallic materials, such as aluminium or tin.

[0030] The present invention is based upon the insight that positioning structures in the underside of the lower deck of a pallet need protection against wear and damage. The present invention benefits from the further insight that relatively simple blocks of a wear-resistant material may form protection elements which suitable provide the protection required.

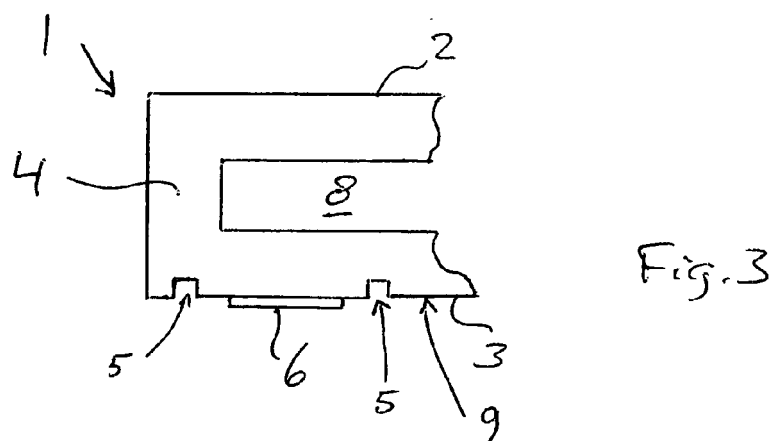
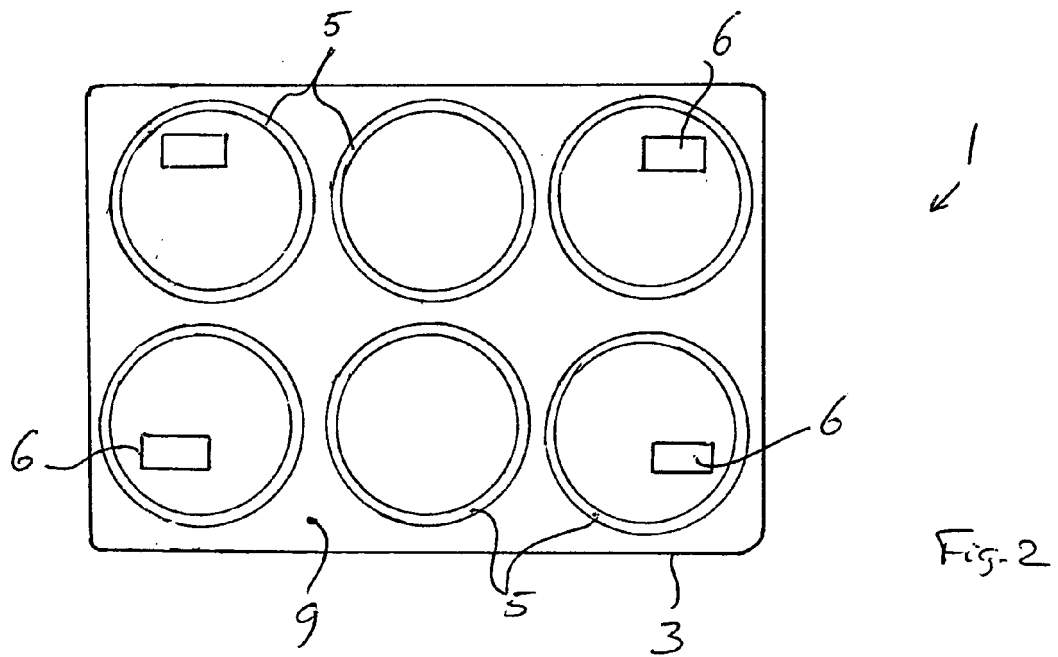
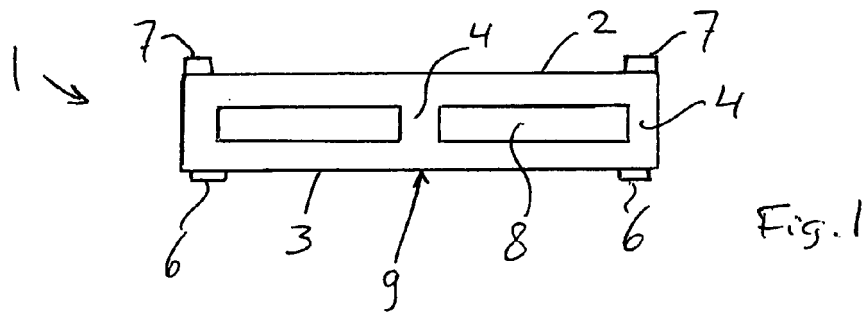
[0031] It is noted that any terms used in this document should not be construed so as to limit the scope of the present invention. In particular, the words "comprise(s)" and "comprising" are not meant to exclude any elements not specifically stated. Single elements may be substituted with multiple elements or with their equivalents.

[0032] It will be understood by those skilled in the art that the present invention is not limited to the embodiments illustrated above and that many modifications and additions may be made without departing from the scope of the invention as defined in the appending claims.

## Claims

1. A plastic pallet (1) having an upper deck (2), a lower deck (3) and support elements (4) connecting the decks, the underside (9) of the lower deck being provided with positioning elements (5), **characterised in that** the lower deck is further provided with protection elements (6) which in use extend below the positioning elements.
2. The pallet according to claim 1, wherein the protection elements (6) are arranged near the corners of the pallet.

3. The pallet according to claim 1 or 2, wherein the protection elements (6) are made of a wear-resistant material.
4. The pallet according to claim 3, wherein the wear-resistant material is a rubber compound.
5. The pallet according to claim 3, wherein the wear-resistant material is a composite material comprising glass fibres.
6. The pallet according to claim 5, wherein the composite material comprises polyethylene and/or polypropylene.
7. The pallet according to any of the preceding claims, wherein the protection elements (6) are constituted by blocks, and wherein the underside of the lower deck (3) is provided with recesses adapted to receive said blocks.
8. The pallet according to any of the preceding claims, wherein the upper deck (2) is also provided with positioning elements (7).
9. A protection element (6) for use in the pallet (1) according to any of the preceding claims.





European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 06 07 6854

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
D,A	EP 1 440 893 A (D W PLASTICS NV [BE]) 28 July 2004 (2004-07-28) * the whole document *	1,3,4,8,9	INV. B65D19/00 B65D19/44
A	DE 94 06 272 U1 (STREUBER SULO EISENWERK F [DE]) 17 August 1995 (1995-08-17) * page 6, paragraph 1 - page 7, paragraph 1; figures 3,4 *	1-3,8,9	
A	US 3 636 888 A (ANGELBECK JOHN A JR) 25 January 1972 (1972-01-25) * abstract; figures *	1-3,8,9	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 29 March 2007	Examiner Gino, Christophe
<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 &amp; : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03/82 (P04C01)

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

EP 06 07 6854

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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29-03-2007

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1440893	A	28-07-2004	NONE	
DE 9406272	U1	17-08-1995	NONE	
US 3636888	A	25-01-1972	NONE	

**REFERENCES CITED IN THE DESCRIPTION**

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- EP 1440893 A2 [0003] [0006]
- GB 2175878 A [0004]
- US 3995749 A [0005]