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

(11) EP 1 847 466 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
24.10.2007 Bulletin 2007/43

(51) Int Cl.:
B65D 19/40 *(2006.01)*

(21) Application number: **07380107.8**

(22) Date of filing: **16.04.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **17.04.2006 ES 200600875 U**

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(54) Pallet leg made of cardboard

(57) It is made by means of a perimetric profile (3), which embraces a number of support blocks (2), which are fixed to the profile by means of gluing. The profile is preferably of C or U-shape, and the horizontal inner section (4) of the profile is equipped with various cross-directional creasing lines (5), ending at angular cuttings (7) in the vertical walls (6) of the perimetric profile (3). In addition, the perimetric profile can have a reinforcement lining incorporated (13).

The ends (11) of the perimetric profile (3) can with advantage be united in the middle of the top of one of the blocks (2).

The pallet legs, positioned parallel to each other, are fixed to a pallet deck or platform (1), in order to build a pallet.

The gluing contact area between the pallet legs and the pallet platform (1), and the stiffness of the pallet is improved.

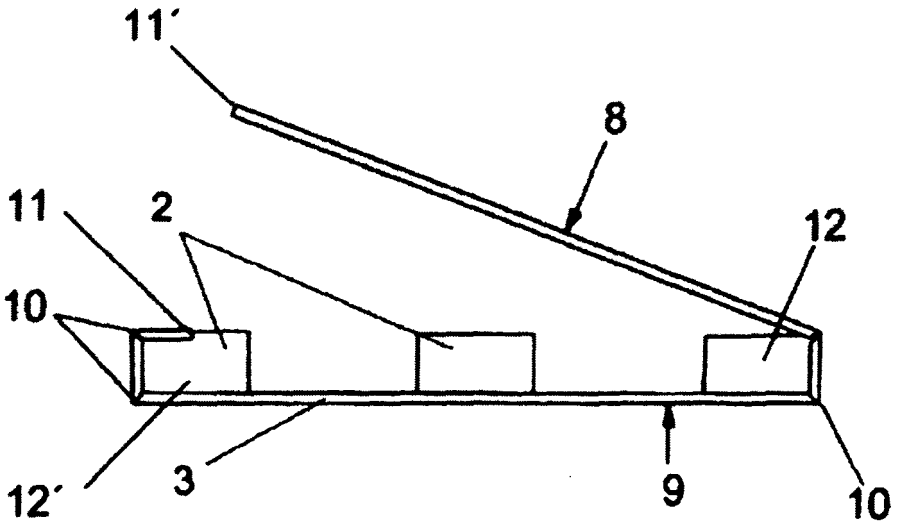

FIG.6

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Description

OBJECT OF THE INVENTION

[0001] The present invention refers to a pallet leg made of cardboard, which is used to support the deck or the platform of the pallet and keep it separated from the floor. The invention refers to pallets, where the pallet legs are made of paper and board fibers, recycled or non recycled, regardless of what raw material has been used in the deck or the platform.

[0002] The objective of the invention is to achieve pallet legs capable to resist important forces, especially in terms of deflection, without any deterioration of the pallet legs, nor a separation of the pallet legs off the plaform or pallet deck.

BACKGROUND OF THE INVENTION

[0003] There is a great variety of cardboard pallets, with significant differences in terms of resistance and properties. Cardboard pallets that are built as an integrated unit, eg; the pallet legs represent an integrated part of the pallet structure, tend to be more stable, but extremely unflexible in relation to different sizes. Therefore, cardboard pallets with individual pallet legs fixed by means of gluing to the pallet deck or the plaform, are much more frequent, thanks to increased versatility.

[0004] However, the latter solution contains a certain risk of having a pallet leg ripped off of the platform, in situations where there is a strong dise force affecting the pallet, for instance, in case the pallet is pushed on the floor.

[0005] Document ES 1 052 138 U discloses a reinforcement for pallet legs is desribed for this kind of pallets. The reinforcement consists of a U-shaped configuration profile made of laminated board, which is fixed to the bottom side of the pallet legs. The U-shaped profile increases considerably the mechanical resistance and the stiffness of the pallet as such. Nevertheless, the document ES 1 052 138 U presents a number of weaknesses, which this new invention will help to solve.

[0006] Quite frequently rough handling with the forklift truck causes damage to the support blocks between the pallet platform and the previously mentioned reinforcements described in the document ES 1 052 138 U, when the fork of the truck erroneously hits the blocks, Such an incident may remove the block from the U-profile and/or the platform.

[0007] Another problem is the reduced surface area for gluing., between the pallet leg and the platform. Heavy movements could separate the platform from the pallet legs.

[0008] It is also posible that the on introducing a manual forklift truck, a so called pallet-jack, into a pallet equipped with the pallet leg reinforcements described in the said document, the vertical walls of the U-shaped profile are easily be damaged by the wheels of the manual forklift.

[0009] Further more, the necessity of having blocks between the platform and the U-shaped profile, impedes the usage of this kind of pallet legs for so called half pallets, which measure 800 x 600 mm, due to lack of space for the fork of the forklift.

DESCRIPTION OF THE INVENTION

[0010] The new pallet leg referred to in this new invention resolves in a satisfactory way the problems previously described. In other words, it makes the cardboard pallet legs considerably stiffer, and at the same time the contact surface for fixing the block, now inside a perimetric construction, to the platform, is significantly increased.

[0011] For this purpose the pallet leg in question, consists of the following components:

(i) A "C" - shaped or preferably "U" - shaped profile, where the vertical walls are of less or equal length as the width of the horizontal inner section of the so called U-profile, made of laminatd board, preferably of one piece and perimetrically formed, where the vertical walls can be equipped with angular cuttings, preferably of 90° and in connection with the cuttings, cross-directional creasing lines in the inner section. Thus the profile can preferably be divided into four or five sectors.

(ii) A lining, preferably of corrugated boxboard, honeycomb panels or similar, with similar dimensions as the inner section of the perimetric profile, properly fixed to the profile, preferably by means of gluing, placed between the support blocks in case of a lining made of several pieces, and a die-cut lining to get the blocks to be easily fit in, in case of a lining of one piece.

(iii) Conventional support blocks, preferably hollow cylinders, which are placed inside the perimetric structure, between the upper horizontal U-profile and the bottom one. They should preferably be directly fixed to the U-profile by means of gluing to the iinner section of the U-profile.

[0012] Based on a perimetric C-shaped profile, or preferably a U-shaped one, made of laminated board, preferably in one piece, the objective is to achieve a perimetric structure, with a series of cross-directional creasing lines to enable the forming of the perimetric structure, angular cuttings, preferably of 90°, matching the position of the cross-directional creasing lines. The cut area of one section will thus be in contact with the corresponding area of the other section.

[0013] In addition a lining can be incorporated to cover the inner section of the U-profile. This lining should preferably be made of corrugated boxboard, honeycomb panels or similar, preferably fixed to the inside of the U-

profile by means of glue. In case the lining is made of one piece, it will be equipped with angular cuttings to offer easier bending and assembly, matching the cross-directional creasing lines and angular cuttings of the perimetric U-profile. The lining can be die-cut in order to place the blocks into the U-profile. The purpose of this lining is to avoid that the wheels of a manual forklift destroy the vertical walls of the U-profile when ibeing ntroduced in the pallet, and to prevent the fork of the forklift from smashing the opposite vertical walls, when lifting the pallet.

[0014] The cross-directional creasing lines as well as the angular cuttings, can be done either with the U-profile and the lining already united, or separately. Once the cross-directional creasing lines with the corresponding angular cuttings have been made in accordance with the design of the product, one or several support blocks are fixed to the inside of the U-profile. The blocks are fixed to the U-profile preferably by means of glue. Glue is also added to the angular cutting of the U-profile and in its lining. Finally the U-profile is bent into its final perimetric structure. The two ends of the U-profile can meet either on a side block or a central block, depending on where union strength is better optimized.

DESCRIPTION OF THE DRAWINGS

[0015] Complementary to the description in this document, and with the object of helping to a better understanding of the characteristics of the invention, according to an exemplary practical embodiment of the same, a set of drawings have been included, forming an integral part of said description, in which, with illustrative and non limitative carácter, the following have been represented:

Figure 1, shows a schematic view of the pallet leg, with a single support block and the reinforcement corresponding to the document ES 1 052 138 U, in which an impact caused by the fork of a forklift truck or some heavy movements could separate the pallet leg from the pallet platform.

Figure 2, shows a schematic view from the bottom side of a conventional pallet with three lines of support blocks, and with three blocks in each line. The contact surface for gluing between the support block and the pallet platform is reduced to the surface of the block itself. Hence, rough handling could affect the gluing, and the block could be separated from the pallet platform.

Figure 3, shows a U-shaped profile equipped with cross-directional creasing lines and corresponding angular cuttings, where the profile is bent in order to obtain its perimetric structure. Thanks to the cross-directional creasing lines, cracking is avoided when bending the different sections to the perimetric structure.

Figure 4, shows once again an U-shaped profile, where a lining has been introduced to the inner side of the U-profile. The purpose of this lining is to avoid that the wheels of a manual forklift truck destroy the vertical walls of the profile, and to prevent the fork of the forklift from smashing the opposite vertical walls, when lifting the pallet.

Figure 5, shows from a perspective view a pallet leg meant for big size pallets, like 800x1200 mm and 1000 x 1200 mm, made in accordance with the object of the present invention.

Figure 6, shows the same pallet leg, before the U-profile is closed to a perimetric structure, and it is to be seen how the two extreme ends of the U-profile meet eachother on the top of one block.

Figure 7, shows a pallet leg with the same perimetric structure, but of smaller size, as for instance 800 x 600 mm. In the side parts there are no support blocks due to lack of space, but thanks to the resistance of the U-profile in a vertical position, the function of the support block is absorbed by the U-profile itself.

Figure 8, shows a schematic view of the positioning of the new pallet legs with regard to the bottom side of the pallet platform, and how the contact surface for gluing between the pallet leg and the pallet platform is increased, thanks to the perimetric structure of the pallet leg. The increase in terms of contact surface for gluing, guarantees a much better fixing of the pallet leg to the pallet platform.

PREFERRED EMBODIMENT OF THE INVENTION

[0016] As previously described in figure 2, a conventional cardboard pallet has been shown, consisting of a pallet platform (1), where on the bottom side a number of support blocks are fixed (2), which can form two, three or more lines, preferably parallelly positioned, of one, two, three or more units, acting as seaparators between the pallet platform (1) and the floor, in order to allow access between the support blocks to the fork of a forklift truck or similar.

[0017] In accordance with the invention, the pallet leg in question, consists of a combination of one or several support blocks (2) and perimetric profile (3) of laminated board, configurated as a "C" or preferably as a "U", where the inner section (4) is equipped with cross-directional creasing lines (5), and where the vertical walls (6), of the perimetric profile (3), have angular cuttings, preferably of 90° (7) matching the previously mentioned cross-directional creasing lines (5), allowing the profile to be bent into a perimetric structure, forming a line as in figure 2.

[0018] The realization of figures 3 and 4, where a C or U-shaped profile (3), preferably in one piece, has preferably been dimensioned to embrace simultaneously

one, two, three or more support blocks (2), forming the pallet leg. In case of only one support block, its position is in the middle of the pallet leg; in case the pallet leg consists of two blocks, one block is positioned at each side end, and in case of three blocks, two units at the side ends and one in the middle; and should more than three blocks be used, two of them would preferably be placed at the side ends, and the other ones in the middle at a similar distance between eachother.

[0019] The C or U-shaped profile (3) can preferably be made of one piece, but can also be configurated by two or more pieces which are united in whatever vertex (10) of the structure, or on the blocks at each end (12) or in the middle of the block.

[0020] In addition, a lining can be incorporated (13) to cover the inner section of the C or U-shaped profile (4). The lining should preferably be made of corrugated boxboard, honeycomb panels or similar, and should be fixed to the perimetric profile preferably by glue. In case of a lining of one piece, it is equally equipped with angular cuttings in order to enable a smooth bending and later assembly, thus matching the cross-directional creasing lines and cuttings of the perimetric profile, the lining is equipped with die-cut areas, in order to have the support blocks easily fit in. In case the lining isn't made of one piece, the linings are put in the space between the support blocks, more precisely in the sections where the wheels of the manual forklift are introduced and the surface corresponding to the area where the fork hits the U-profile on lifting the pallet.

[0021] In the preferred embodiment of the invention, it is foreseen that the perimetric profile (3) is closed preferably in the middle of the top of one of the blocks (2), as is shown in figures 3 and 4. Thus, instead of having the U-profile equipped with four cross-directional creasing lines (5) offering four inter-connected sectors, the invetion stands for four cross-directional creasing lines offering five inter-connected sectors, as is also described in figures 6 and 7.

Claims

1. A cardboard pallet leg made as a perimetric structure, with one or several support blocks, **characterized in that** using a support block as a core, a perimetric profile, preferably in one piece, made as a C or preferably as a U, made of laminated board with vertical walls of 10 to 20 mm length, equipped with a number of cross-directional creasing lines, crossing the inner section of the U-profile, and matching the position of the creasing lines with angular cuttings in the vertical walls of the profile, preferably of 90°, and once folded and glued with one or several support blocks, the perimetric profile becomes an embracing structure, where one, two, three or more support blocks get perfectly integrated and embraced. The outer side of the bottom side of the perimetric profile is in contact with the floor, and the outer side of the upper side of the same perimetric profile is fixed to the pallet platform, obtaining a significant improvement in terms of stiffness.

2. A cardboard pallet leg made as a perimetric structure, with one or several support blocks, according to claim 1, **characterized in that** the ends of the perimetric profile, in pallet legs with two or more support blocks, are united preferably on a lateral part of the profile, enabling the union to be placed and glued on the top of a block positioned at the side end of and inside the perimetric profile.

3. A cardboard pallet leg made as a perimetric structure, with one or several support blocks, according to previous claims, **characterized in that** the ends of the perimetric profile, in pallet legs with one or more support blocks, are united preferably in the middle of the profile, enabling the union to be placed and glued on the top of a block positioned in the inner section of the perimetric profile.

4. A cardboard pallet leg made as a perimetric structure, with one or several support blocks, according to previous claims, **characterized** further in that a lining can be incorporated into the inner section of the C or U-shaped profile, fixing it preferaby by means of glue, and that the lining, preferably of a thickness similar to the inner height of the vertical walls of the perimetric profile, is equipped with cuttings and creasing lines, matching the cuttings and the cross-directional creasing lines of the U-profile, giving an easier folding and later assembly.

5. A cardboard pallet leg made as a perimetric structure, with one or several support blocks, according to previous claims, **characterized, in that** the profile in question is defined by five sectors, determined by four cross-directional creasing lines, in which the first and the last sector represent the ends of the perimetric profile, and which are later united, giving a combined length equal to the length of the pallet leg, The inner width of the profile should preferably be the same as the width of the blocks, in order to ensure a perfect fixing and gluing of the blocks inside the perimetric profile.

6. A cardboard pallet leg made as a perimetric structure, with one or several support blocks, according to previous claims, **characterized in that** the profile in question is defined by four sectors, determined by four cross-directional creasing lines, and where the point of union can be at any vertex of the structure, preferably in the upper ones. The inner width of the profile should preferably be the same as the width of the blocks, in order to ensure a perfect fixing and gluing of the blocks inside the perimetrical profile.

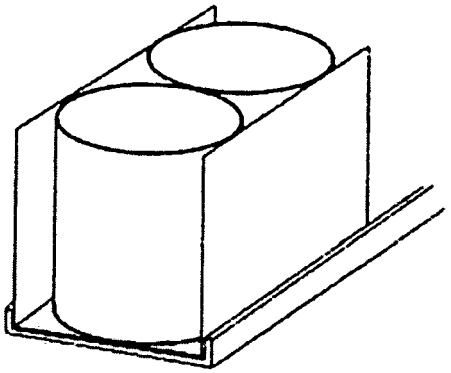

FIG.1

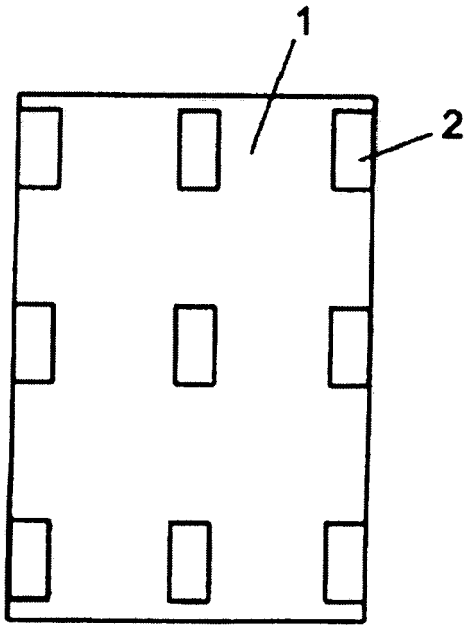

FIG.2

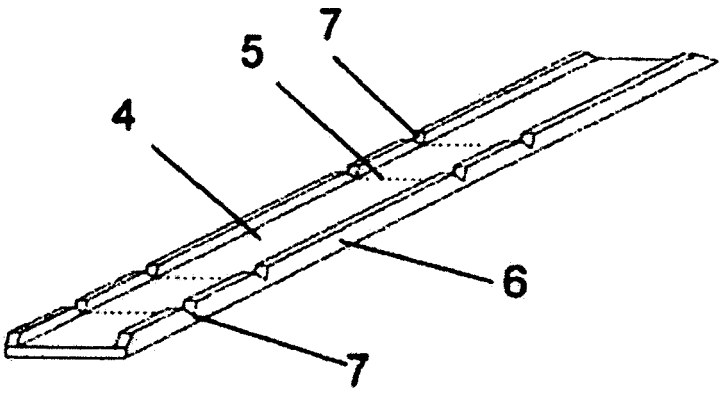

FIG.3

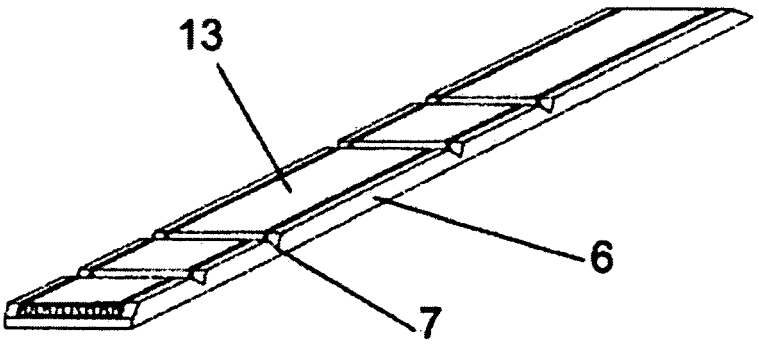

FIG.4

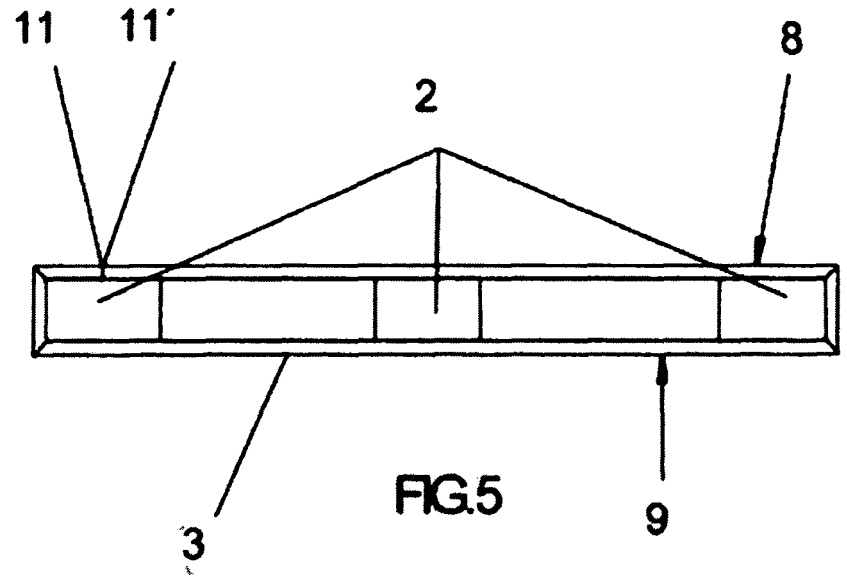

FIG.5

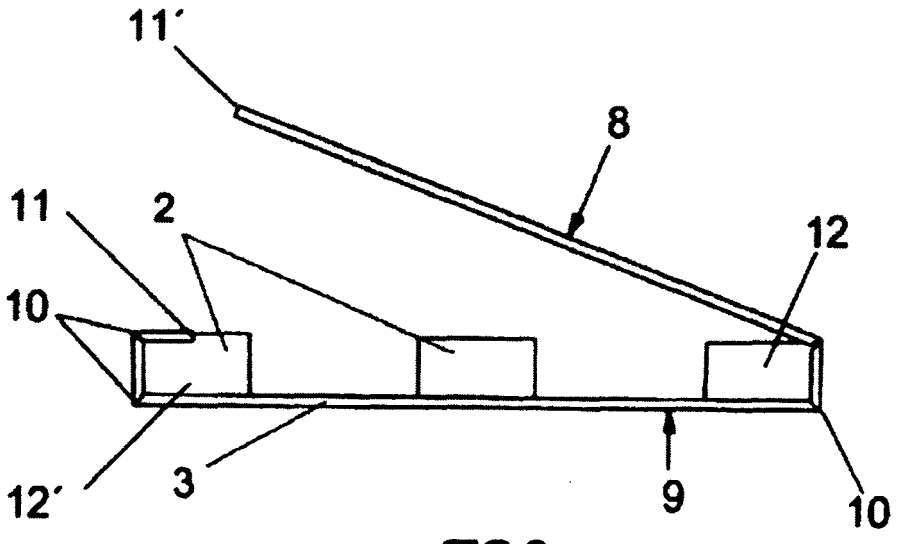

FIG.6

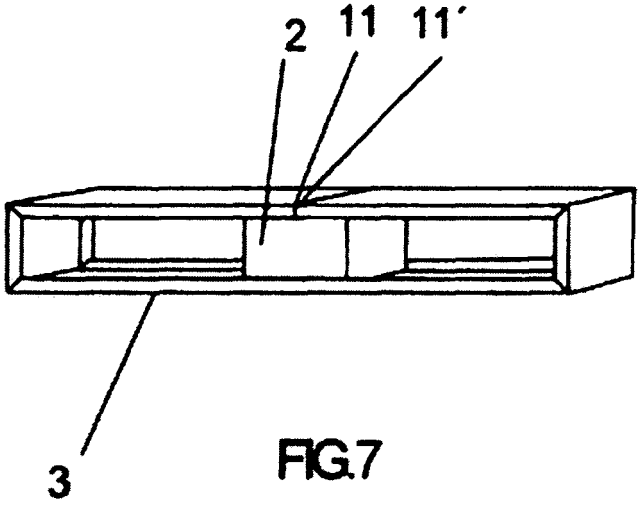

FIG.7

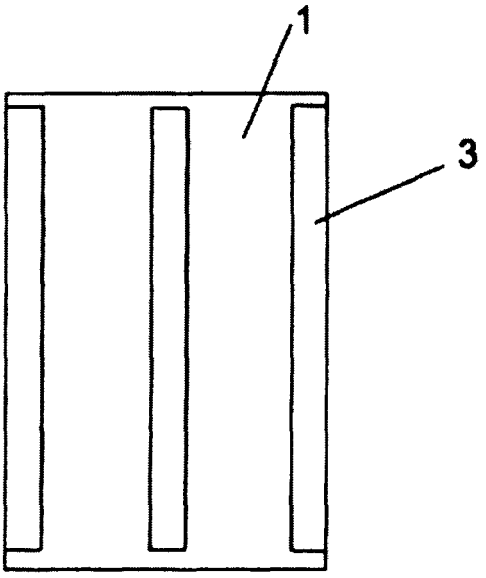

FIG.8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- ES 1052138 U **[0005] [0005] [0006] [0015]**