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Pallet

The invention concerns a pallet consisting of a number of parallel stringers and a deck surface formed by deck elements fitted at right angles to the stringers at distances one from the other the stringers being constructed of at least two rectangular parallel plates arranged predominantly vertically and joined to each other and having recesses at their top into which the deck elements fit closely.

A pallet of this kind is described in DE—A—2032220. A drawback of this pallet is that the fastening of the deck elements to the stringers is rather difficult due to the small contact surfaces between them. From US—A—3058709 a pallet is known whereby the deck elements lie in the recesses of rather heavy stringers. Due to their heaviness these stringers are not suitable to be made of plastics material.

Efforts to design a pallet which complies simultaneously with a multiplicity of requirements specified by users have meant that the market has been flooded in the last few decades with a great variety of pallet versions each of which satisfies more or less of those requirements.

Experience shows that in large sectors of the market compliance with the following three main criteria is still insisted on. In the first place the pallet has to be inexpensive, preferably so inexpensive that it can be used as a one-way or expendable pallet. Secondly, the pallet has to be light with a view to ease of handling and because of transport costs. In the third place it must have a loading capacity such that fairly heavy loads of, for example, 1000 kg are possible without causing the deformation of the pallet to increase beyond acceptable limits. A large number of other requirements specified can usually also be met without much difficulty. The dimensions can be altered as desired or measures can be taken to enable the pallet to be used for a particular application.

The invention concerns a pallet which satisfies the three main conditions mentioned, while at the same time, on the basis of the original form of the pallet, the use of present-day technical possibilities enables an entirely new and surprising pallet design to be offered.

In accordance with the invention this is obtained by the fact that the connection between the plates consists of transverse partitions which are vertically arranged immediately beside the recesses.

By designing the stringers of the pallet in this way great rigidity combined with low weight can be obtained. The stringers with the transverse partitions and recesses will preferably be made of plastic in one piece by injection moulding. The thickness of the material and the sizes of the plates and partitions can be adjusted as desired, as also can the plastic to be selected. With regard to the length of the stringers the requirements to be met can be easily satisfied by making use of an adjustable mould. The number of stringers will depend on the size of the pallet but is usually three. Smaller pallets can be made with only two stringers.

It is an advantage that vertically arranged transverse partitions should extend over the whole height of the plates to ensure that the plates do not buckle under a load. The arrangement of the transverse partitions immediately beside the recesses makes it possible to fasten the deck elements to be inserted in the recesses to the transverse partitions and hence to the stringers with glue or staples or with the aid of snap-in fastenings. There can be transverse partitions on either side of the recesses. In the case of stringers consisting of more than two plates the transverse partitions may, with a view to saving material, but also in order to make fastening of the deck elements on two sides possible, be fitted alternately to opposite sides of the recesses in adjacent spaces between the plates. Greater stability of the deck elements is thus obtained.

The deck elements may be supported by all the stringers. It is, however, also possible for a deck element to span fewer stringers. The first version is preferable for reasons of stability and production.

A stringer consisting of four plates with a number of alternately arranged transverse partitions alongside the recesses is in many cases of sufficient strength to take usual loads.

In a preferred embodiment of the invention the deck elements are of rectangular cross-section and are arranged so that their narrow sides form the load-bearing surface of the pallet.

As already stated, the pallets with recesses in them can be made of plastic integrally with the transverse partitions by injection moulding. The deck elements, however, will be preferably made of another material possessing greater rigidity. The chief materials in mind are wood and board, of which wood deserves preference because of its deflection properties and the fact that wood is more resistant than board to the effects of moisture.

It is an advantage to have the deck elements project somewhat above the stringers. In this way it is chiefly the deck elements which are subject to wear and, if necessary, they can be replaced.

In some cases it may be advisable to fit the underside of the pallet with two or three stacking strips perpendicular to the stringers.

To make the pallet suitable for four-way approach by a forklift truck holes can be made in the long sides of the stringers in which the fork of a fork-lift truck can be inserted. It will be clear that there is ample space between the stringers for this purpose on the other side of the pallet.

The invention will now be further explained with reference to an example of embodiment in the drawing. In the drawing:

Fig. 1 is a top view of a pallet according to the invention in which some deck elements have been omitted;

Fig. 2 is a front view of the pallet in Fig. 1;

Fig. 3 is a section along III—III in Fig. 1;

Fig. 4 is a side view of the pallet in Fig. 1; and

Fig. 5 is a detail, on a larger scale, of a stringer with deck element as shown in the outlined part V in Fig. 1.

Fig. 1 shows stringers marked 1, 2 and 3 of a pellet and deck elements marked 4. To bring out the recesses more clearly in the drawing some deck elements have been omitted. Every stringer consists of four rectangular plastics plates 6, 7, 8 and 9, arranged predominantly vertically, with recesses 5 made in their upper sides; see Figs. 1 and 4. Besides the recesses transverse partitions 10 are fitted over the full height of the plastics plates. The ends of the stringers are fitted with end plate 11. Transverse partitions 10 are fitted in such a way that they are located in gaps 12, 13 and 14, alternately immediately next to one of the sides of the recesses. The deck elements inserted in the recesses are thus better supported on both sides.

The wooden deck elements which have a rectangular cross-section are placed so that their narrower sides form the load-bearing surface of the pallet. This means that the fullest possible advantage is taken of the rigidity properties of the material of which the load-bearing (deck) elements consist. These load-bearing elements may be completely recessed into the stringers or project slightly above them.

The load-bearing elements are fastened to the stringers by stapling them to the adjacent transverse partitions as shown by 15 in Fig. 5. They can also be fastened by gluing or with the aid of snap-in fastenings.

Using of plastics deck elements is possible too.

As indicated in Fig. 4 the long sides of the plates have openings 16 and 17 to make entry by the fork of the fork-lift truck possible.

It can be seen from Figs. 2 and 3 that the position of plates 6, 7, 8 and 9 is not completely vertical. That, however, is desirable in order to obtain the necessary draft for the dies in an injection-moulding mould.

Example

In a pallet produced in accordance with the description and drawing the stringers were made of low-density polyethylene. The plates and transverse partitions were 3 mm thick. Wooden deck elements with cross-section dimensions of 32 x 10 mm were placed in the recesses. The dimensions of the pallet were 1200 x 800 mm. The total weight of the pallet was 5.8 kg, of which 1.4 kg was accounted for by the wood.

The pallet was tested using a fork-lift truck for lifting and laying, the DIN 32600 as guideline, the width of the truck forks being 100 mm and the centre distance between the forks 575 mm. The load was 600 kg, distributed evenly over the pallet. The deflection in the middle and at the outside of the pallet was found to be 3.5 mm.

In a load test in which the pallet, standing on a flat base, was subjected to an evenly distributed load of 1200 kg (=2-high stacking), a deflection of 1.5 mm was found to have occurred in the middle between the stringers after 24 hours. The test were carried out at an ambient temperature between 25 and 30°C.

Claims

1. A pallet conisting of a number of parallel stringers (1, 2, 3) and a deck surface formed by deck elements (4) fitted at right angles to the stringers at distances one from the other, the stringers (1, 2, 3) being constructed of at least two rectangular, parallel plates (6, 7, 8, 9) arranged predominantly vertically and joined to each other and having recesses (5) at their top into which the deck elements (4) fit closely, characterised in that the connection between the plates consists of transverse partitions (10) which are vertically arranged immediately beside the recesses (5).

2. A pallet as claimed in claim 1, characterised in that transverse partitions (10) are fitted on either side of recesses (5).

3. A pallet as claimed in claim 1 or 2, characterised in that in the case of stringers made up of more than two plates the transverse partitions (10) are fitted alternately on either side of the recesses (5), in adjacent spaces between the plates.

4. A pallet as claimed in any of claims 1 to 3, characterised in that the deck elements (4) are fastened to the stringers (1, 2, 3) by stapled, glued or snap-in fastenings between the deck elements and the transverse partitions.

5. A pallet as claimed in any of claims 1 to 4, in which each stringer (1, 2, 3) is made up of four plates (6, 7, 8, 9).

6. A pallet as claimed in any of claims 1 to 5, in which the stringers (1, 2, 3) are made of plastic and the deck elements (4) of wood.

Revendications

1. Palette se composant d'un certain nombre de longrines parallèles (1, 2, 3) et d'une surface de plancher formée par des éléments de plancher (4) ajustés à angle droit par rapport aux longringes, à distance l'un de l'autre, les longrines (1, 2, 3) étant construites avec au moins deux plaques parallèles rectangulaires (6, 7, 8, 9) agencées de manière prédominante verticalement et jointes l'une à l'autre, et comportant à leur partie supérieure des évidements (5) dans lesquels les éléments de plancher (5)

s'adaptent étroitement, caractérisée en ce que la liaison entre les plaques consiste en des cloisons transversales (10) qui sont agencées verticalement immédiatement à côté des évidements (5).

2. Palette selon la revendication 1, caractérisée en ce que les cloisons transversales (10) sont agencées de chaque côté des évidements (5).

3. Palette selon la revendication 1 ou 2, caractérisée en ce que, dans les cas de longrines constituées par plus de deux plaques, les cloisons transversales (10) sont agencées en alternance sur chaque côté des évidements (5), dans les espaces adjacents entre les plaques.

4. Palette selon l'une des revendications 1 à 3, caractérisée en ce que les éléments de plancher (4) sont fixés aux longrines (1, 2, 3) par fixation par agrafage, à la colle ou rapide, entre les éléments de plancher et les cloisons transversales.

5. Palette selon l'une des revendications 1 à 4, caractérisée en ce que chaque longrines (1, 2, 3) est composée de quatre plaques (6, 7, 8, 9).

6. Palette selon l'une des revendications 1 à 5, caractérisée en ce que les longrines (1, 2, 3) sont faites en plastique, et les éléments de plancher (4), en bois.

Patentansprüche

1. Palette, bestehend aus einer Anzahl parallel angeordneter Holme (1, 2, 3) und einer Ladefläche, die von Deckelementen (4) gebildet wird, welke rechtwinklig in bestimmten Abständen voneinander an den Holmen befestigt sind; hierbei bestehen die Holme (1, 2, 3) aus mindestens zwei rechtwinkligen, parallel angeordneten Platten (6, 7, 8, 9), die überwiegend vertikal angeordnet und miteinander verbunden sind und die an der Oberseite mit Aussparungen (5) versehen sind, in welche die Deckelemente (4) fest eingelassen sind, dadurch gekennzeichnet, dass die Verbindung zwischen den Platten aus Quertrennwänden (10) besteht, die vertikal unmittelbar neben den Aussparungen (5) angeordnet sind.

2. Palette nach Anspruch 1, dadurch gekennzeichnet, dass Quertrennwände (10) auf jeder Seite der Aussparungen (5) angebracht sind.

3. Palette nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass im Falle von Holmen für mehr als zwei Platten die Quertrennwände (10) abwechselnd auf jeder Seite der Aussparungen (5) in aneinander angrenzenden Zwischenräumen zwischen den Platten angebracht sind.

4. Palette nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, dass die Deckelemente (4) an den Holmen (1, 2, 3) durch Klammern, Verleimung oder Schnappverschlüsse zwischen den Deckelementen und den Quertrennwänden befestigt sind.

5. Palette nach einem der Ansprüche 1 bis 4, bei welcher jeder Holm (1, 2, 3) aus vier Platten (6, 7, 8, 9) besteht.

6. Palette nach einem der Ansprüche 1 bis 5, bei welcher die Holme (1, 2, 3) aus Kunststoff und die Deckelemente (4) aus Holz bestehen.

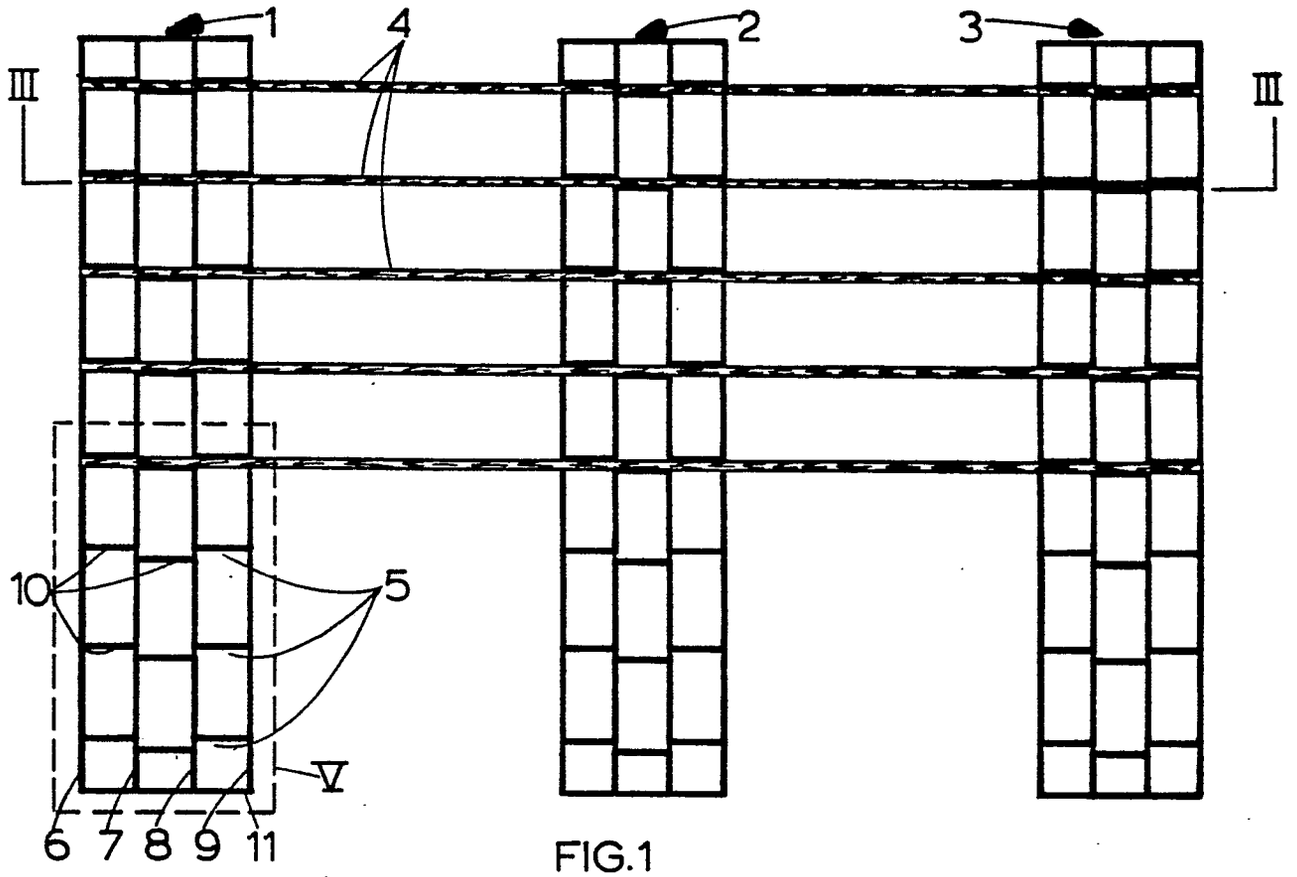

FIG.1

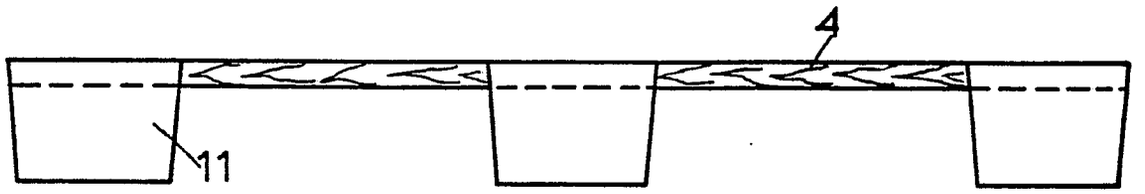

FIG.2

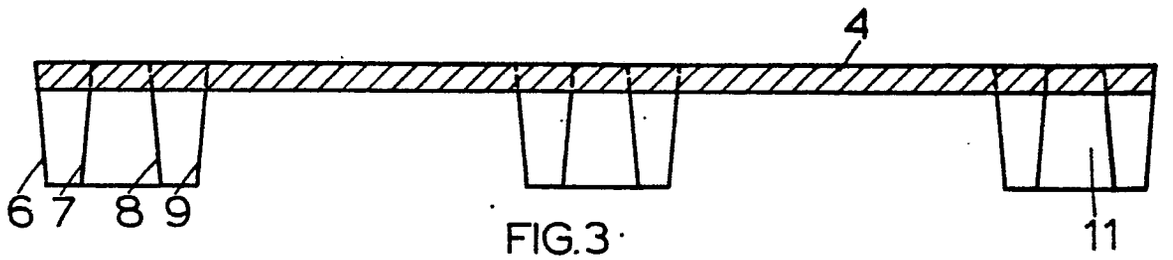

FIG.3

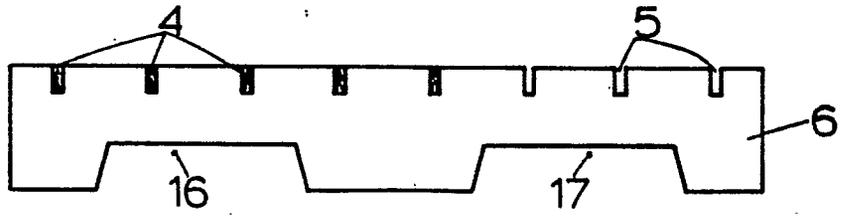

FIG.4

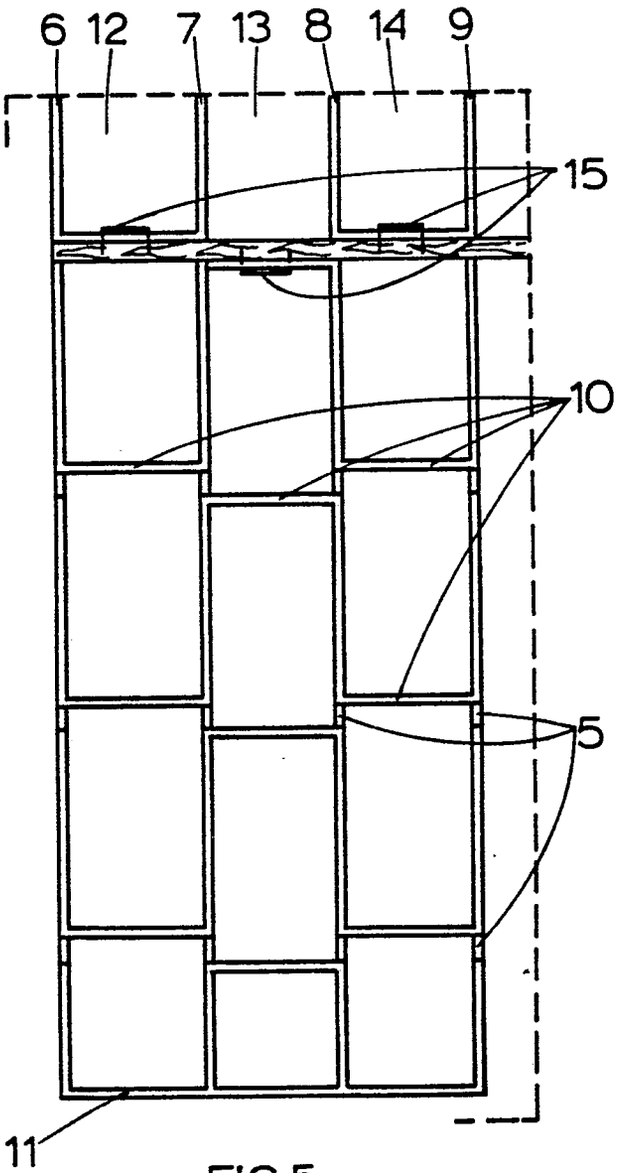

FIG.5