

Pallet

The invention relates to a pallet, comprising an upper cover plate, a lower cover plate and columns between the upper cover plate and the lower cover plate.

- 5 Such pallets are nowadays used on a large scale for storing and for transporting all kinds of goods.

These pallets are usually made of wood, but nowadays for a number of uses of paper material, too, such as solid cardboard upper and lower cover plate and columns made of
10 solid cardboard tubes. These cardboard pallets are easily recycled and lightweight, whereas wooden pallets are heavy, they splinter and they are difficult to recycle. For certain uses the pallet is, however, heavily loaded
15 because it is stacked with solid cardboard plates, for instance, between which air is pressed out with the help of a machine. The forces on the pallet column can amount to 1500 kg because the load is not always equally distributed. A cardboard pallet with solid cardboard columns
20 creates spoilage in the product stacked on it, in that one column causes an indentation in the lower products through the upper cover plate. Consequently, up until now wooden pallets are still used for this purpose.

- 25 The invention aims at removing the drawbacks of the known pallets.

This aim is achieved in that the upper cover plate and the lower cover plate are made of paper material and in that
30 the columns are made of material which can be rammed in in the longitudinal direction of the columns and is formed by rolled up corrugated board, the ends of the columns being arranged in holes in the upper cover plate and the lower



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cover plate.

In this way it is achieved that a column, which is subjected to a disproportionately high load, will be rammed in so that the load is distributed over all the columns. Columns made of rolled up corrugated board are very suitable for that, given that in the direction of its face corrugated board can be rammed in and still retains its load bearing capacity, in particular at the edge of a plate, after ramming in and is also sufficiently rigid and strong in a rolled up condition to take up the required load. Because one or more of the columns that have been subjected to a disproportionately high load are rammed in, the load distributed over all the columns will hardly cause any indentation in the products stacked on the pallet, so that the upper and lower cover plates can be made of paper material. In order to obtain a good attachment to the upper and lower cover plates of the columns made of rolled up corrugated board, which have no optimum attaching potential at their head end faces, the ends of the columns are arranged in holes in the upper and lower cover plates. Thus the pallet is suited for the intended purpose, and is also lighter and more easily recycled than a wooden pallet.

Preferably, the upper cover plate and the lower cover plate are made of honeycomb plates comprising a honeycomb core and an outer cover plate and an inner cover plate, so that a rigid and yet lightweight pallet is obtained.

According to an advantageous embodiment the holes in the upper cover plate and the lower cover plate extend through the inner cover plates and the core up to the outer cover plates and with their end faces the columns bear against the inner surface of the outer cover plates, so that the column cannot protrude outside the upper and lower cover plates and the columns are easily and securely attachable



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in the upper and lower cover plates.

According to another advantageous embodiment the holes in the upper cover plate and the lower cover plate are through-going and the end faces of the columns are flush with the outer surface of the outer cover plates. As a result the holes in the upper and lower cover plates are simple to make. In this embodiment it is also advantageous that not only the edge of the hole in the inner cover plate bears against the outer surface of the column, but also that the edge of the hole in the outer cover plate of the honeycomb plate bears against the outer surface of the column, so that taking up lateral forces on the pallet is improved and the pallet has more resistance to shearing forces.

Preferably every column is provided at every end with an attaching tenon having a smaller diameter than the rest of the column and having a diameter and length which corresponds to the holes in the upper and lower cover plate, so that the attaching tenons are entirely received in the upper and lower cover plate, and the shoulder faces which are formed at the transitions between the tenons and the rest of the column provide additional attaching and supporting surfaces of the column against the inner cover plate of the upper and lower cover plate.

The columns are preferably bonded in the holes in the upper and lower cover plate, so that when manoeuvring a pallet it does not fall apart.

Preferably the upper cover plate of honeycomb plate is approximately 20 mm thick, and preferably the lower cover plate of honeycomb plate is approximately 10 mm thick, so that the pallet with honeycomb plates is sufficiently rigid and the outer and inner cover plates of the honeycomb plates are spaced far enough apart so that in the



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case of through-going holes shearing forces on the pallet can be taken up to an adequate extent.

5 Preferably every column of rolled up corrugated board is approximately 115 mm in diameter, so that each column can take up sufficient force.

10 Preferably the attaching tenons on the columns of rolled up corrugated board are approximately 93 mm in diameter, so that the shoulder faces at the transition between the tenon and the rest of the column are large enough, while the diameter of the tenons remains large enough to take up lateral forces on the pallet.

15 According to an advantageous embodiment the corrugated board is selected and rolled up such that a column is rammed in at a load between 1000 and 1500 kg, after which other columns of the pallet take up part of the load on that one column and ramming in thereof ceases. A dispropo-
20 rtionately high load between 1000 and 1500 kg on one column is distributed over other columns of the pallet by ramming in said column somewhat, so that all the columns will take up an approximately equal part of the load and the product on the pallet will not be damaged by a dispropo-
25 rtionately high load on just one column.

Preferably the upper and lower cover plates are approximately 1 by 1.2 metres in size.

30 The invention will now be elucidated in more detail by a preferred embodiment on the basis of the drawing.

Figure 1 is a top view of the pallet according to the invention,

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figure 2 is a cross section according to the line II-II in figure 1,



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figure 3 is a cross section according to the line III-III in figure 1 and

figure 4 is a perspective view of a column of the pallet.

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According to the preferred embodiment the pallet according to the invention consists of an upper cover plate 1, a lower cover plate 2 and columns 3, of which, for example, nine are arranged. The upper cover plate 1 and the lower
10 cover plate 2 are both made of honeycomb plate, which consists of a core 4 and 5 respectively, of strips of thin cardboard, formed and attached to each other such that for instance hexagonal "honeycombs" are formed, and of an
15 outer cover plate 6 and an inner cover plate 7, which are bonded on both flat sides on the core 4 and 5 respectively. Preferably the cover plates 6 and 7 consist of solid cardboard.

According to the preferred embodiment continuous holes 8
20 are arranged in the upper cover plate 1 and the lower cover plate 2 for receiving the attaching tenons 10 and 11 provided on the columns 3. The length of the attaching tenons 10 and 11 is adapted to the length of the holes in the upper cover plate and the lower cover plate respectively, so that they do not protrude outside the outer
25 cover plates. The tenons 10 and 11 are bonded in the holes 8, the shoulder faces 14 and 15 being bonded on the inner surfaces of upper cover plate 1 and lower cover plate 2 and the edges of the holes in the cover plates 6 and 7 are
30 bonded to the outer surface of the attaching tenons 10 and 11.

It is possible, however, to allow the holes in the upper cover plate 1 and lower cover plate 2 to end at the inner
35 surfaces of the outer cover plates 6, so that the end faces 12 and 13 of the tenons 10 and 11 are bonded to these inner faces.



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According to a preferred embodiment the columns are made of rolled up corrugated board of the one-sided type, and are of a thickness such that they ram in at the required load.

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In the preferred embodiment the upper and lower cover plate 1, 2 are approximately 1 by 1.2 metres in size and the upper cover plate is approximately 20 mm and the lower cover plate approximately 10 mm thick. The columns 3 are approximately 115 mm in diameter, and the attaching tenons 10, 11 on the columns approximately 93 mm in diameter. A column 3 is rammed in at a load between 1000 and 1500 kg, after which other columns of the pallet take up a part of this (disproportionately high) load and the ramming in of that specific column ceases.

In the preferred embodiment the corrugated board for the columns is of the E-wave RCK 110/125 type.

20 Finally, approximately rectangular, continuous holes 9 are arranged in the lower cover plate 2, which serve to move the pallet by means of a hand cart for pallets over a floor, for example.

25 It will be clear that this preferred embodiment does not limit the rights as they follow from the claims below.

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**Claims**

1. Pallet comprising an upper cover plate, a lower cover plate and columns between the upper cover plate and the lower cover plate, characterized in that the upper cover plate (1) and the lower cover plate (2) are made of paper material and in that the columns are made of material which can be rammed in in the longitudinal direction of the columns and is formed by rolled up corrugated board, the ends of the columns (3) being arranged in holes in the upper cover plate (1) and the lower cover plate (2).
2. Pallet according to claim 1, characterized in that the upper cover plate (1) and the lower cover plate (2) are made of honeycomb plates comprising a honeycomb core (4, 5) and an outer cover plate (6) and an inner cover plate (7).
3. Pallet according to claim 2, characterized in that the holes in the upper cover plate (1) and the lower cover plate (2) extend through the inner cover plates (7) and the core (4, 5) up to the outer cover plates (6) and in that the columns (3) bear against the inner surface of the outer cover plates (6) with their end faces (12, 13).
4. Pallet according to claim 2, characterized in that the holes in the upper cover plate (1) and the lower cover plate (2) are through-going and in that the end faces of the columns (3) are flush with the outer surface of the outer cover plates (6).
5. Pallet according to any one of the preceding claims, characterized in that every column (3) is provided at every end with an attaching tenon (10, 11) having a smaller diameter than the rest of the column and having a





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diameter and length which corresponds to the holes in the upper and lower cover plate (1, 2).

6. Pallet according to any one of the preceding claims,
5 characterized in that the columns (3) are bonded in the holes in the upper and lower cover plate.

7. Pallet according to any one of the preceding claims,
characterized in that the upper cover plate (1) of honey-
10 comb plate is approximately 20 mm thick.

8. Pallet according to any one of the preceding claims,
characterized in that the lower cover plate (2) of honey-
comb plate is approximately 10 mm thick.

15 9. Pallet according to any one of the preceding claims,
characterized in that every column (3) of rolled up corrugated board is 115 mm in diameter.

20 10. Pallet according to any one of the claims 5 to 9,
characterized in that the attaching tenons of the columns (3) of rolled up corrugated board are approximately 93 mm in diameter.

25 11. Pallet according to any one of the preceding claims,
characterized in that the corrugated board is selected and rolled up such that a column is rammed in at a load between 1000 and 1500 kg, after which other columns of the pallet take up part of the load on that one columns and
30 ramming in thereof ceases.

12. Pallet according to any one of the preceding claims,
characterized in that the upper and lower cover plates are approximately 1 by 1.2 metres in size.

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