Abstract:

The object of the invention is a load-carrying vehicle part of a vehicle for passenger transportation, the vehicle part being made of a bamboo-based material.

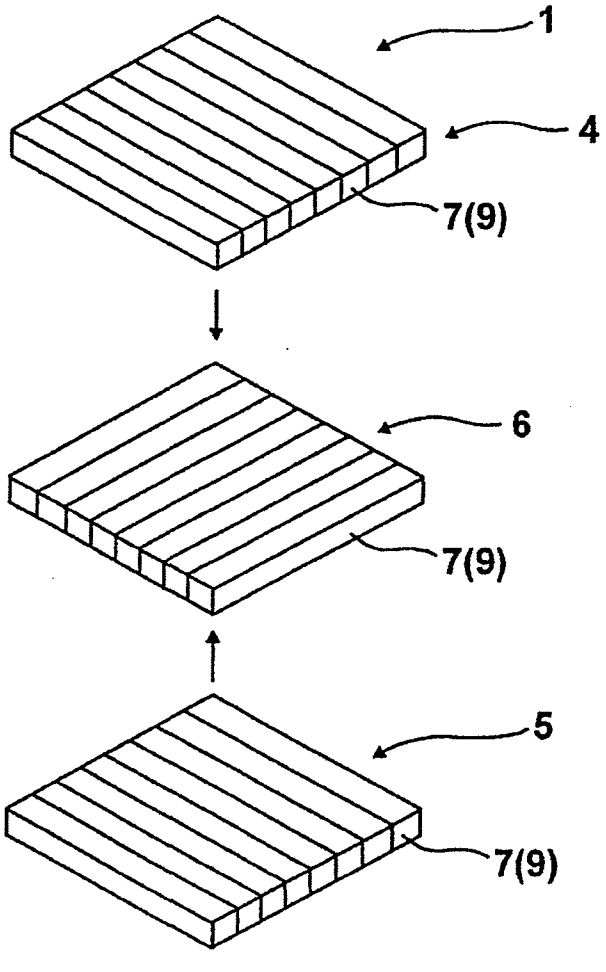

Fig. 1

Claims:

1. A load-carrying vehicle part of a vehicle for passenger transportation, characterized in that
the vehicle part is made of a bamboo-based material.

2. The load-carrying vehicle part according to claim 1, characterized in that
the vehicle part is manufactured in the manner of a plate (1).

3. The load-carrying vehicle part according to claim 2, characterized in that
the plate (1) is formed by flatly oriented, bamboo-based rods (7) that are connected to each other.

4. The load-carrying vehicle part according to claim 3, characterized in that
as a first layer (4) of flatly oriented, glued together, bamboo-based rods (7), the plate (1) has at least one second layer (6).

5. The load-carrying vehicle part according to claim 4, characterized in that
the at least one second layer (6) of bamboo-based rods (7) runs at an angle to the first layer (4).

6. The load-carrying vehicle part according to claim 4 or 5, characterized in that
the rods (7) of the at least one second layer (6) have a flat orientation.

7. The load-carrying vehicle part according to claim 4 to 6, characterized in that
the at least two layers (4, 6) are glued to each other.

8. The load-carrying vehicle part according to claim 4, characterized in that
the at least one second layer (6) is formed by floorboards (9).

9. The floor of a personnel-lifting device according to claim 2, characterized in that the bamboo-based plate (1) is made of floorboards that are glued together.

10. The load-carrying vehicle part according to claim 9, characterized in that the plate (1) has at least two layers (4, 6) of bamboo-based floorboards (9), the layers (4, 6) being glued together.

11. The load-carrying vehicle part according to claim 10, characterized in that the floorboards (9) of the at least two layers (4, 6) run at an angle relative to each other.

12. The load-carrying vehicle part according to one of the afore-mentioned claims, characterized in that the vehicle part is the floor of a vehicle, e.g. of a bus, the wheelchair ramp of a vehicle, e.g. a bus or a rail vehicle, the gangway bridge of an articulated vehicle, e.g. of a rail vehicle, the bridge members of a gangway of an articulated vehicle, e.g. of a rail vehicle, or the platform of an articulated vehicle, e.g. an articulated bus.

13. The load-carrying vehicle part according to one of the claims 2 to 12, characterized in that the plate (1) has an anti-slip finish, more specifically an anti-slip coating.

14. The load-carrying vehicle part according to claim 12 characterized in that the wheelchair ramp of a vehicle has a plate (1) that is edged by an edge profile on at least three, preferably four sides.

15. The load-carrying vehicle part according to claim 14, characterized in that the edge profile is made of plastic, rubber or polyurethane.

16. The load-carrying vehicle part according to one of the claims 3 to 15, characterized in that the rods (7) or floorboards (9) are made of pressed bamboo.

Dated this 30th day of May, 2014

8

(MEENAKSHI MAHARAJ)
(Regn. No.: IN/PA-1064)
of D.P. AHUJA & CO.
APPLICANT'S AGENT

1/2

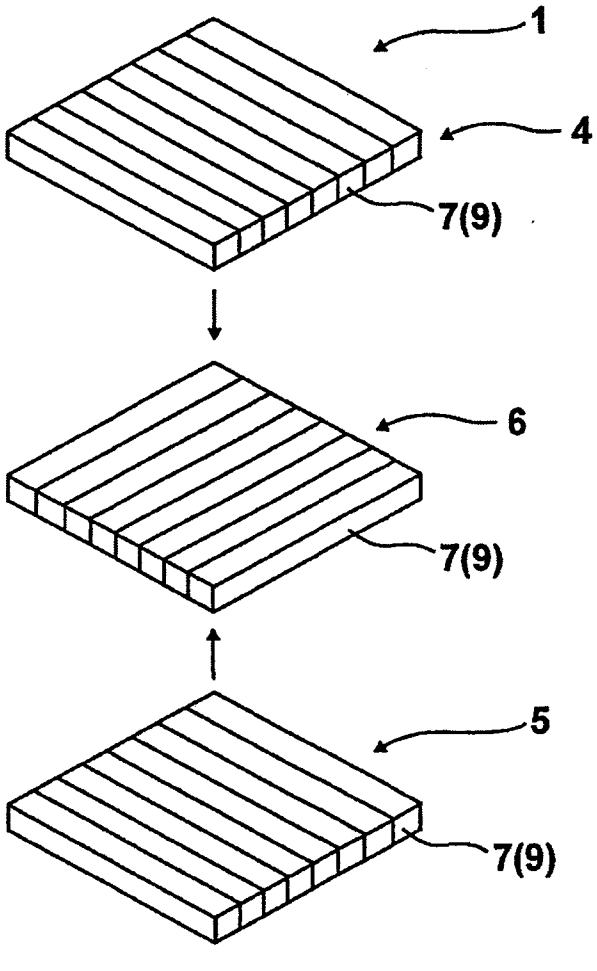

Fig. 1

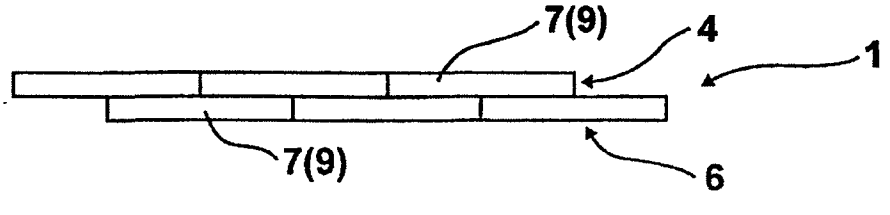

Fig. 2

S. D. AHUJA
of D. P. AHUJA & CO.
APPLICANT'S AGENT

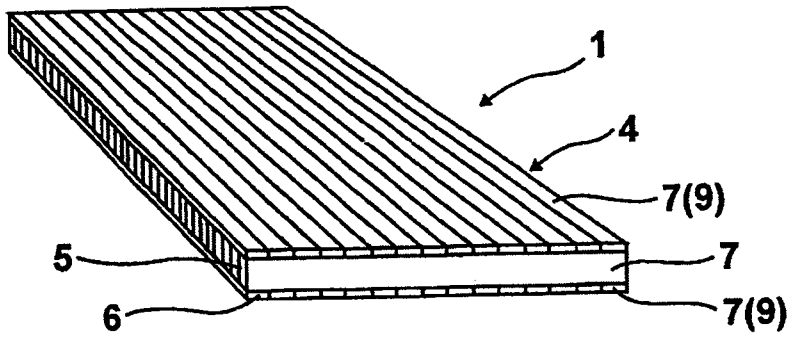

Fig. 3

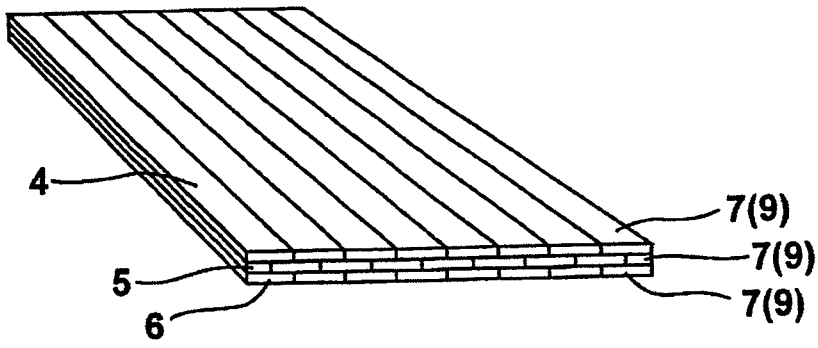

Fig. 4

S. D. AHUJA
of D. P. AHUJA & CO.
APPLICANT'S AGENT

A LOAD-CARRYING VEHICLE PART

The invention relates to a load-carrying vehicle part of a vehicle for passenger transportation.

Load-carrying vehicle parts of a vehicle for passenger transportation are sufficiently known. The floor of a bus or a rail vehicle in particular is known as a load-carrying vehicle part. Here, "load-carrying" means that the component can withstand the weight of people standing on it. Currently, the floor of a bus in particular is made of aluminium, which is more advantageous with regard to weigh than steal but still represents considerable weight.

Other load-carrying vehicle parts of a vehicle for passenger transportation as defined by the invention are for example the platform of an articulated bus, the gangway bridge of a rail vehicle, which can also be configured as an articulated gangway for example, or individual bridge members comprising two floor plates, on which a tread plate rests. The gangway bridge as well as the bridge members and the platform of such a vehicle is made of metal, more specifically of aluminium.

Other load-carrying parts of a vehicle as device as defined by the invention are ramps serving as access aids for wheelchairs, such ramps being designed to be deployed or extended. Such ramps have a ramp floor that is usually made of a Metawell® plate that is laterally edged by an edge profile of plastic, rubber or PU.

Therefore, the problem underlying the invention consists in providing a load-carrying component for a passenger transportation vehicle that can be manufactured at low cost, is insensitive to the influence of humidity and is additionally able to carry high loads while having a relatively small weight.

In order to solve the problem, the invention proposes a load-carrying vehicle part of a vehicle for passenger transportation made of a bamboo-based material. Bamboo is a grass that is extremely resistant since it has a high hardness similar to that of wood and is moreover insensitive to the influence of humidity due to its structure. In addition, the relatively great hardness of the bamboo also comes with a high loading capacity. In this respect, a vehicle part made of a bamboo-based material is also capable of carrying great

loads while having little weight and is additionally insensitive to the influence of humidity, so that it is indeed suitable for use in vehicle construction. In addition, bamboo has a high degree of fire safety. Bamboo does not burn easily; it merely glows, which is important with regard to fire safety.

Advantageous features and embodiments of the invention can be gathered from the dependent claims.

Thus, it is more specifically provided that as a load-bearing part, the floor is configured as a plate. In this regard, such a plate is usable as a component, for example as a floor of a bus, as a platform of an articulated vehicle or as part of a gangway bridge between two articulately connected cars of a rail vehicle. In particular the use of such a bamboo-based plate as a tread plate of a ramp serving as an access aid to a bus or a rail vehicle is also conceivable, wherein the plate can be provided with an anti-slip finish, e.g. coated with an anti-slip coating, and is preferably edged on all four sides by an edge profile made of plastic, rubber or PU. Instead of an anti-slip coating, it is also conceivable to roughen the surface by structuring the surface of the plate, e.g. by inserting flat grooves.

Different possibilities for manufacturing such a bamboo plate are conceivable.

Advantageously, it can be provided to form the plate with flatly oriented bamboo-based rods, which are glued together. In order to increase the load capacity of such a plate, the plate serving as a first layer of flatly oriented, glued together, bamboo-based rods can be provided with at least one, second, bamboo-based layer. Here, the at least one second layer also runs at an angle to the first layer, in order to provide a solid laminate. The second layer can also be formed by bamboo-based rods, the rods of the first and the at least one second layer running at an angle, for example of 90° relative to each other. In this respect, the rods of both layers are flatly oriented, i.e. the horizontal extension of the rods, i.e. their extension parallel to the plate surface, is greater than the extension of the rods perpendicular to the plate surface, i.e. in the vertical direction. Alternately, the rods of the first and the at least one second layer can also be disposed in laminar relation relative to each other, i.e. glued together so that they overlap. In another alternative a layer of floorboards can be provided as the at least one second layer, which is glued together with the first layer of flatly oriented horizontally running rods. Floorboards differ from rods in that with regard to the surface of the plate they are substantially wider than they are high. The invention also comprises the arrangement of three and more layers above one another, the layers being formed in the same way as described above and connected to each other to form a plate.

It can also be provided to manufacture the plate with upright, glued together, bamboo-based rods. "Upright" means that the width of the rods in the parallel direction to the upper side or underside of the plate is smaller than the height of the rods. In this context, in order to increase the loading capacity, at least one second, bamboo-based layer can be disposed parallel to the first layer of upright, glued together rods, the layers being also glued together. The second layer, preferably also made of bamboo-based rods, runs at an angle to the first layer. One possibility for increasing the loading capacity also consists in also forming the second layer with uprightly oriented, bamboo-based rods. However, it is also conceivable to glue the second, floorboard-based layer with the first layer of upright, glued together, bamboo-based rods.

As another embodiment, the plate is formed by floorboards, wherein the floorboards are glued together. The plate advantageously has at least two layers of floorboards, the layers being also glued together. In this context, it can be more specifically provided that the floorboards of the at least two layers run at an angle, more specifically at a right angle relative to each other.

The material itself for manufacturing the rods or floorboards can be made of pressed bamboo. This means that the bamboo cane is accordingly sawed up to form rods or floorboards and, if necessary, subsequently given its final form in the mould of an autoclave by supplying heat and pressure. A bamboo pressed in this manner has very good fire safety properties due to its high density and meets the requirements according to DIN 5510-2. Alternately or additionally, during the manufacture of corresponding plates, the bamboo in the form of rods or floorboards can be pressed while adding glue. Thereby, the rods and floorboards are pressed as such on the one hand and the rods and floorboards are pressed to form a plate on the other hand. Pressing the rods and floorboards as such and pressing the rods and floorboards during the manufacture of the plate both fall in the invention. The only important thing is that the bamboo is compacted by pressing, which increases fire safety. Such a plate also has an increased fire safety, providing that the glue itself is not or hardly flammable.

In the following, the invention is exemplarily described in more detail based on the drawings.

Fig. 1 shows the structure of a plate with two or three layers formed by rods or floorboards, the rods or floorboards of the layers running transversely to each other;

Fig. 2 shows a plate with a two-layered structure, rods or floorboards being connected to each other with the same laminar orientation relative to each other;

Fig. 3 shows a three-layered variant of a plate with rods disposed upright in the middle layer;

Fig. 4 shows a three-layered variant, wherein three layers of rods or floorboards run respectively laminar relative to each other.

In the embodiment according to fig. 1, rods 7 or floorboards 9 are provided for forming a first layer 4 for a laminated plate 1, the second layer 6 also consisting of floorboards 9 or rods 7, the floorboards 9 or rods 7 of the second layer 6 running at an angle of 90° to the floorboards 9 or rods 7 of the first layer 4. A third layer 5 that is formed like the upper layer can be provided optionally, thus leading to a three-layered structured. Here too, the individual layers 4, 5 and 6 but also the floorboards or rods of one plate are glued together.

In the embodiment of a plate 1 according to fig. 2, two layers 4, 6 with horizontally or flatly oriented rods 7 or floorboards 9 with rectangular cross-sections are provided, which run in a laminar relation relative to each other, the layers 4, 6 but also the rods or floorboards of the individual layers 4 and 6 being glued together. Here too a three-layered variant is conceivable.

Figure 3 shows a three-layered variant of a plate, wherein vertically running rods 7 are provided between two layers 4, 6 of horizontally disposed or oriented rods 7. The individual rods or floorboards as well as the individual layers 4, 5, 6 are here respectively glued together.

Fig. 4 shows a three-layered variant, the individual rods 7 or floorboards 9 of the individual layers 4, 5, 6 being respectively disposed in a laminar relation relative to each other.

Regarding the definition of the terms "uprightly" and "flatly" oriented rods or floorboards, it is pointed out that with uprightly oriented rods or floorboards, the horizontal extension of the individual rods or floorboards parallel to the upper side of the plate is lesser than the vertical extension, the rods and floorboards in this arrangement thus being higher than they are wide. With flatly oriented rods or floorboards, the

horizontal extension of the individual floorboards or rods parallel to the upper side of the plate is conversely greater than the vertical extension.

List of reference numbers:

1	plate
4	layer
5	layer
6	layer
7	rods
9	floorboards