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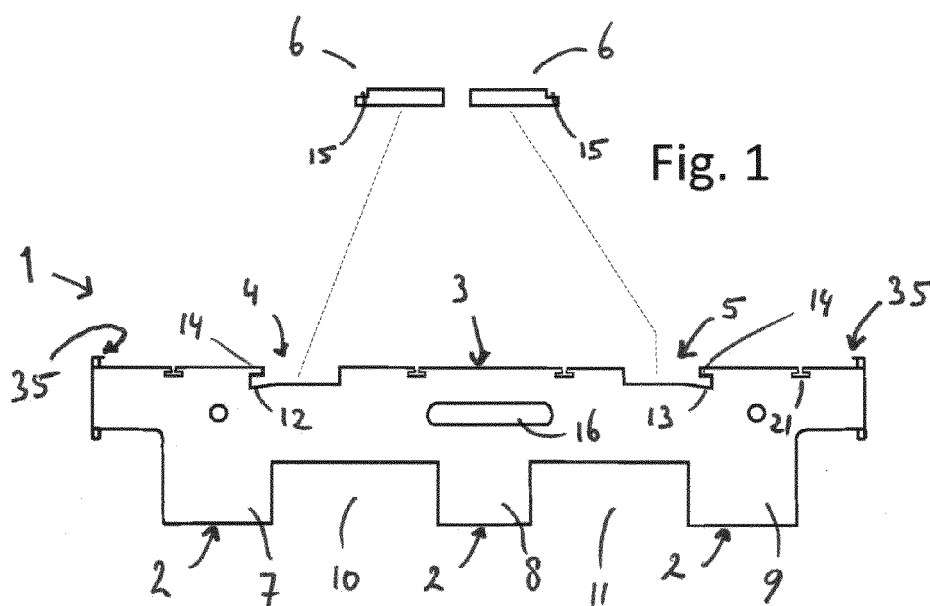
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(54) **CARRYING BODY FOR A DEMOUNTABLE CONSTRUCTION, SET OF CARRYING BODIES AND A COUPLING ELEMENT, AND DEMOUNTABLE CARRYING STRUCTURE**

(57) The invention relates to a carrying body (1) for a demountable support construction, comprising a support surface (2) to be placed on a base and a carrying surface (3) for carrying goods located opposite the support surface, wherein the carrying surface extends between two side surfaces from a first end to a second end of the carrying body, wherein the carrying surface comprises at least one recess (4, 5) extending from a first side face wholly or partly to a second side face of the

carrying body for receiving a coupling element (6) in the at least one recess for mutually coupling at least two parallelly placed carrying bodies, wherein the recess comprises two sides directed towards the two respective ends of the carrying body, and wherein a part of the recess is covered on one side. The invention also relates to a set of at least two carrying bodies and a coupling element and to a demountable carrying structure formed with a carrying element.



Description

[0001] The present invention relates to a carrying body for a demountable carrying construction according to the preamble of claim 1.

[0002] Such a carrying body is not known in the art. Such carrying bodies can for instance be used for constructing a demountable carrying structure, of which a pallet is a known but non-limiting example. Until now, pallets consist of rectangular, sometimes square, supporting platforms for carrying goods and objects. They are used in the storage and transportation of a variety of goods. Due to the standard dimensions of a pallet, often but not exclusively in so-called euro format, the maximum size of the goods in question is relatively limited in order not to allow the goods to protrude beyond the carrying platform of the pallet. Stacking goods, such as boxes, in several layers is usually good and easy to do if the boxes can be arranged on the pallet in such a way that substantially the entire surface of the platform is covered. This enables stable and efficient storage and transport.

[0003] Goods that cannot be efficiently placed on the platform of the pallet either have the disadvantage that a larger area is occupied by the pallet than is actually required for the goods in question (the goods have a smaller surface area than the carrying platform of the pallet), or that the goods protrude on the outside of the pallet, which can cause damage to the goods and, moreover, that the pallet is difficult to handle.

[0004] In particular, it is virtually impossible to transport or store plate-shaped objects with a size that is larger than the size of the carrying platform of a pallet, such as plasterboards, with a pallet. If this is attempted anyway, the plate-shaped goods quickly suffer damage to the parts that protrude outside the pallet.

[0005] There is no known solution to this problem in the art. For example, US2004/0000259A1 discloses a pallet which consists of bottom plates and top plates and intermediate uprights for manufacturing a coupled pallet, the top plates serving to form a carrying surface. The top and bottom plates slide into recesses and can only be inserted or removed from one side, which takes a lot of time and effort. KR 2015/0123559 describes a similar construction.

[0006] The object of the invention is to provide a solution for this drawback of existing carrying constructions, which is known from practice.

[0007] It is also an object of the invention to provide a carrying body with which a pallet or similar carrying construction can be assembled in a quick and simple manner, with which products can be stored, transported and handled in a simple manner.

[0008] In particular, the object of the invention is to provide a solution with which plate-shaped goods can be transported, stored and handled in a simple and stable manner.

[0009] It is also an object of the invention to provide a solution with which plate-shaped objects can simply be

placed on a carrying plane and fully supported thereon.

[0010] It is also an object of the invention to provide a solution with which a carrying plane can be easily adjusted to a desired size in order to be able to efficiently support plate-shaped goods of different sizes.

[0011] In order to obtain at least one of the aforesaid advantages, according to a first embodiment, the invention provides a carrying body for a demountable carrying constructions comprising the features of claim 1. This carrying body has the advantage that not only plate-shaped materials but an uncountable number of different goods that may have a size deviating from a standard pallet can be transported, stored and handled in a stable, simple and efficient way.

[0012] It has also been found that the invention provides a solution for the drawback that the pallets used in practice take up a lot of space during storage. Such a synergistic action is a particularly great advantage of the present invention.

[0013] The invention therefore relates to a carrying body for a support construction like a pallet, but is not limited thereto, comprising a support surface to be placed on a base and a carrying surface for carrying goods located opposite the support surface, wherein the carrying surface extends between two side surfaces from a first end to a second end of the carrying body, wherein the carrying surface comprises at least one recess extending from a first side face wholly or partly to a second side face of the carrying body for receiving a coupling element in the at least one recess for mutually coupling at least two parallelly placed carrying bodies, wherein the recess comprises two sides directed towards the two respective ends of the carrying body, characterized in that a part of the recess is covered on one side. By placing two carrying elements parallel to each other, the coupling element can be inserted into the recesses of both carrying elements, so that the carrying elements are mutually coupled. As a result, a carrying construction with the functionality of a pallet is obtained. However, the parts are easy to detach, making storage very easy.

[0014] In particular, the present invention has the synergistic advantage that the individual parts are less heavy than a complete pallet, allowing a single person to handle the individual parts.

[0015] The invention therefore relates to a carrying body which per se, because of the carrying plane, has a suitable supporting surface on which to place products. The coupling element mainly serves to mutually couple two carrying bodies, wherein in particular the carrying plane of the carrying bodies serves to support and carry products. It is preferable that the width of the carrying plane of the carrying body is greater than the width of a coupling element.

[0016] In contrast to the products from the said prior art, the carrying bodies according to the invention can be coupled to form a much larger supporting surface than that of a standard pallet. A particularly great advantage of the present invention is that this increased applicability

is obtained with a minimum number of parts.

[0017] In order to obtain a stable positioning of the carrying elements and the goods to be placed thereon, it is preferable that the carrying surface is situated parallel to the supporting surface.

[0018] A construction that is highly adaptable to a user's needs includes a carrying body wherein the carrying surface has a rectangular shape with two opposite short side edges and two opposite long side edges and wherein the opposite short side edges have an upright edge. The upright edge on the short side edges provides a stop for goods or products placed on the carrying element, as a result of which those goods or products cannot slide off the carrying element during transport or during handling of the carrying element.

[0019] A particularly effective coupling of the coupling element in the recess is obtained wherein the at least one recess forms a recess in the carrying surface and extends partly below the cover. Because the recess is partly located under the carrying plane, which means that the carrying plane projects over the recess from an edge of the recess and thus forms a lip above the recess, the coupling element will be carried by said protruding part if it is pushed from below. The lip carries at least part of the coupling element. The recess serves to ensure that the coupling element, when placed in the recess, can first be guided into the recess with the forwardly projecting end of the coupling element, so that the tilting movement of the tilting element to a position below the lip is possible.

[0020] A preferred variant, therefore, relates to wherein at least a portion of the recess located below the cover is deeper than at least a portion of the recess not located below the cover.

[0021] In particular, an even support of goods on the carrying element and a certain displacement of a number of carrying elements coupled with coupling elements can be obtained wherein the carrying body comprises at least two recesses in the carrying surface, each recess being adapted to receive a respective coupling element. For instance, the forks of a fork-lift truck can be placed under the coupling elements, next to two carrying elements or between two coupling elements, after which, when the forks are raised, they touch the coupling elements and lift the whole. Because the coupling elements abut against the lip, i.e. the projecting parts, the carrying elements are also lifted by the forks of the fork-lift truck. The coupling elements are automatically kept flat by the pressure of the forks, so that they cannot tilt and come detached from the recesses. When goods are placed on the coupling elements and on the carrying element, the fixed positioning of the coupling elements in the recesses will increase even further.

[0022] When a carrying element has several recesses, it is preferred that each recess comprises a lip, in particular a single lip. In this specification, the lip is also referred to as a cover. Lips of two different recesses in a carrying element are preferably not provided on the same side. A

lip is then provided on the side of a first short side or a first end of the carrying body, while the lip of the other recess is provided on the side of the other short side or the second end of the carrying body. This effectively prevents the coupling elements from being slid out of the recesses during a sliding movement of the set of carrying elements and coupling elements.

[0023] In order to obtain a simple positioning of the coupling element, it is preferred wherein the at least one recess extends between two opposite long side edges of the carrying body. As a result, the carrying element can serve as a support for one or more coupling elements.

[0024] A simple placement of the coupling element can be obtained wherein at least a portion of the recess located below the cover is deeper than at least a portion of the recess not located below the cover.

[0025] Alternatively, it is preferable that at least a part of the recess which is situated below the carrying surface is deeper than at least a part of the recess which is not situated below the carrying surface. The part of the carrying plane mentioned here is the part of the carrying plane protruding above the recess, which part of the carrying plane in that case also forms the cover.

[0026] In addition to the at least one recess for locating a coupling element for mutually coupling carrying elements the carrying surface may comprise one or more secondary recesses for receiving support feet of support elements to be placed on the carrying surface. These support elements may be walls extending from the carrying plane between or against which movable, including without limitation sliding and rolling, goods can be placed, such as pipes, ducts, beams, planks and the like.

[0027] The secondary recesses preferably extend between the two opposite side faces of the carrying body, whereby the support feet can be slid into the secondary recesses and a shape of these secondary recesses can be chosen so that they are fixedly but detachably coupled to the carrying element.

[0028] To obtain such a fixed but releasable coupling it is particularly preferable wherein the secondary recesses are shaped as an I providing an interference fit with an insertable element, or as an inverted T, an L, an inverted Y, or any other shape which prevents the support foot from pulling out perpendicular to the carrying surface.

[0029] In order to make as large a surface as possible of the carrying element suitable for carrying the aforementioned movable goods and products, it is preferable that the secondary recesses are provided near one or both of the short side edges of the carrying surface. When, according to a preferred embodiment, the coupling elements extend perpendicular to the carrying elements, this provides a maximum surface area for carrying such goods within the support elements to be placed on the carrying plane.

[0030] It may be preferable to cover or secure the products and goods located on the carrying element and the

coupling elements. This can be done with, for example, a tension strap or a tarpaulin. In that case the carrying body is preferably provided with at least one of a hook lug and a recess at one end of the carrying body for coupling a tensioning strap or tarpaulin.

[0031] When the carrying element is not used to provide a carrying plane, for instance in the sense of and to replace a pallet which is customary and known in the art, the separate carrying elements can be stored together. This storage can for instance take place on single carrying elements which are placed next to each other and optionally with the long side surfaces against each other and on which other carrying elements are positioned. Said other carrying elements can be arranged concatenated, with their side faces placed on the carrying plane. A first plane of carrying elements lying on their sides may be positioned in a first direction, while a subsequent plane of carrying elements are positioned in a direction perpendicular thereto, and so on. Preferably, the carrying elements have lugs on their one side and receiving openings on their other side into which the lugs fit when positioning the carrying elements in this way. This prevents shifting of the carrying elements. The invention therefore preferably also relates to a carrying body wherein cams are provided on a first side surface on a long side of the carrying body and receiving openings are provided on an opposite second side surface on a long side of the carrying body for receiving the cams of another carrying body when placing carrying bodies against each other.

[0032] It is also preferred that the carrying elements comprise on their underside, i.e. on the bottom surface, recesses from one long side surface to the other long side surface for receiving the forks of a fork-lift truck or pump truck, so that such a stack of carrying elements can be easily handled and transported.

[0033] According to a further aspect, the invention relates to a set of at least two carrying bodies according to the invention and a coupling element.

[0034] According to a further aspect, the invention relates to such a set comprising at least two coupling elements.

[0035] In this set it is preferred that the at least one coupling element is a plank-shaped element with a width and a thickness suitable for receiving the plank-shaped element in the recess and a length suitable for coupling of at least two carrying bodies placed parallel to each other. At least one goal as mentioned above is hereby achieved. A variety of materials can be used for the plank-shaped element, such as a plastic material, but natural materials or materials derived from natural materials can also be suitably used. A particularly advantageous material is cardboard, in particular pressed cardboard or paper, optionally with a connecting means to obtain sufficient strength for the purpose and this application. Where the term "plank" is used in this specification, it is particularly intended without limitation also to include a cardboard plank or shelf-shaped element.

[0036] Finally, the invention relates to a set as men-

tioned above, further comprising a cover plate for placement on a coupled set of at least two carrying bodies and at least one coupling element. The cover plate provides a continuous surface for carrying goods of relatively smaller individual size.

[0037] Furthermore, the invention relates to a set according to any one of claims 15 to 18, wherein the at least one coupling element has a smaller width than the width of the carrying body, distance between the two side surfaces thereof, preferably wherein the width of the coupling element is maximum 0.9 times the width of the carrying body, preferably a maximum of 0.8 times, more preferably a maximum of 0.7 times.

[0038] The invention also relates to a demountable carrying structure formed with a carrying element or a set according to the invention and as mentioned in the description above or in the description of the drawing hereafter.

[0039] The invention will be explained in more detail below with reference to a drawing. The drawing hereby shows:

fig. 1 is a schematic side view of a support element according to the invention,

Fig. 2 is a view according to Fig. 1 with goods on it, Fig. 3 is a view according to Fig. 1 with goods on it, Fig. 4 is a top view and a side view of a coupling element,

Fig. 5 is a top view of a carrier elements coupled to coupling elements,

Fig. 6 is a simplified perspective view of Fig. 5, Fig. 7 is a view according to Fig. 1 with goods on it, Fig. 8 is a view according to Fig. 1 with a cover plate on it,

Fig. 9 is a top view of Fig. 8,

Fig. 10 is a top view of a number of carrying elements, and

Fig. 11 is a side view with plate supports.

[0040] In the figures, the same parts are indicated by the same reference numerals. However, the parts necessary for a practical implementation of the invention are not all shown because of the simplicity of the representation.

[0041] Fig. 1 shows a schematic side view of a carrying element 1 according to the invention. The carrying element 1 comprises a support surface 2 to be placed on a base or surface (not shown) and a carrying plane 3 situated opposite the support surface for carrying goods. Examples of goods that can be carried on the carrying element 1 are shown in Fig. 2, Fig. 3 and Fig. 7. Fig. 8 and Fig. 9 show a cover plate which can be placed on the carrying elements according to the invention to increase the carrying surface.

[0042] The height of the carrying plane 3 relative to the support surface 2 is 260 mm in the embodiment shown, which offers great ergonomic advantages for a user.

[0043] In the variant shown, the carrying plane 3 com-

prises two recesses 4, 5 for receiving a coupling element 6. With the coupling element 6, as shown in Fig. 4 in top view and side view, two parallel carrying elements 1 can be releasably coupled.

[0044] The carrying element 1 can be placed on the base with legs 7, 8, 9, wherein the support surface is provided on the underside of the carrying element 1. Openings 10, 11 are provided between the legs 7, 8, 9 into which forks of a forklift truck or a pump truck can be inserted for transporting or handling the carrying elements 1 and any cooperating parts or goods placed thereon.

[0045] A recess 12, 13 is provided in the recesses 4, 5 in order to facilitate the insertion of the coupling elements 6. Also provided is a lip 14, or a projecting part 14, under which the coupling element 6 is placed. In particular, it is shown in Fig. 1 that the coupling element comprises a cutout 15 for receiving the lip 14. This provides a continuous carrying plane 3 when the coupling elements 6 are placed in the recesses 4, 5.

[0046] A handle 16 facilitates the handling of a carrying element 1 by a user.

[0047] Fig. 2 shows the carrying element 1 with a stack 17 of plate-shaped goods placed thereon. The legs 7, 9 are placed at a distance from a side 18, 19, so that a user can stand with his shoe 20 under the carrying element 1, which promotes ease of use.

[0048] Fig. 3 shows an extension of the carrying element 1, wherein additional ancillary recesses 21 are provided in the carrying plane 3 for receiving support feet 22 of support elements 23 to be placed on the carrying plane 3.

[0049] The side recesses 21 extend perpendicularly in the plane of the drawing between two opposite side surfaces, which are the long sides of the carrying body. The sides 18, 19 herein form the two short ends 18, 19 of the carrying element 1.

[0050] As shown in the figures, the secondary recesses 21 are formed as an inverted T. Other shapes are possible, in particular it is possible that the secondary recesses are formed as a simple which provides an interference fit with an insertable element, or alternatively the aforementioned inverted T, an L, an inverted Y, or other shape that prevents extension of the support foot 22 perpendicular or substantially perpendicular to the carrying plane.

[0051] Two side recesses 21 are provided in the illustrated embodiment near the short ends 18, 19 of the carrying plane 3 in order to be able to place a large volume of movable materials between the support elements 23.

[0052] Fig. 3 shows a variety of movable goods, such as tubes 24, conduits 25 and beams 26 (seen from the end face).

[0053] Fig. 4 shows a top view in which the great length and the small width of the coupling element 6 are clearly recognizable. Also, Fig. 4 shows a side view from a short end of the coupling element 6, like Fig. 1.

[0054] Fig. 5 shows a top view of two carrying elements

1 and two coupling elements 6 operatively coupled. This creates a total carrying plane 3 with a width and length that are determined by the length and width of the carrying elements 1 and the coupling elements 6. This results in a demountable carrying construction, which can, for example, have the shape of a pallet but has a much wider application. Fig. 6 shows a schematic perspective view of this demountable carrying construction.

[0055] The forks of a forklift truck or the like can be placed in the space 27 between the two carrying elements 1 in order to lift and transport the pallet. Because the coupling elements 6 abut against the lip 14 and are kept in a horizontal position by their own weight and by the upward pressure of the forks, the coupling elements 6 will not be removed from the recesses 5. This self-locking character is further enhanced when goods are on the carrying plane 3 and is novel in such an application.

[0056] Fig. 7 shows a variant with support elements 28 for placing plate-shaped goods 29, for example plasterboards, in a standing position. An additional support element can be arranged in the side recesses 21 in order to prevent the plate-shaped goods from shifting.

[0057] Fig. 8 shows a side view of a carrying element with a cover plate 34 placed thereon. The cover plate can be placed under projections 35 (see also in Fig. 1) to obtain a firm coupling to the carrying elements 1. Fig. 9 shows a top view thereof. This provides a fixed carrying plane 3, which can be advantageous for goods that are smaller than the gaps formed between the carrying elements 1 and the coupling elements 6.

[0058] Several layers of carrying elements 1 placed on their side can be placed on the carrying plane 3 of a number of carrying elements 1 placed next to each other. To prevent the carrying elements 1 from sliding, cams 30 are provided on a long side surface 31 of the carrying elements 1 and receiving openings 33 are provided on the opposite long side surface 32 of the carrying elements. In order to be able to place the carrying elements 1 in each subsequent layer lying on their side over 90°, but also to be able to place the carrying elements 1 consecutively against each other and to be able to nest, there are provided in each case two cams on one side surface 31 and four receiving openings 33 on the other side face 32. The coupling elements 6 can advantageously comprise a hinge at a position in the middle of the long side edges, along which the coupling elements 6 can be folded. The length of the coupling elements 6 is then substantially equal to the length of the carrying elements 1, so that they can be placed on the carrying elements placed on their side and stored or transported together. The hinge can be a simple notch that allows the coupling element 6 to be folded in half.

[0059] Finally, Fig. 11 shows a carrying element 1 with two supports thereon, which can be seen as a variant of the support elements 28 described above, for placing plate-shaped elements, for instance plasterboards or wooden plates, in standing position against it. These plate-shaped elements can be placed against the sup-

ports. The supports each have a coupling element, substantially in the form of the coupling element 6 described above, for receiving in a recess 4, 5, as well as an additional supporting element which can be placed in a secondary recesses 21 that is provided in a central position, i.e. between the two recesses 4, 5, to prevent sliding of the support. Also provided on the mutually directed side surfaces of the two supports are a projection and recess, respectively, which, in cooperation, provide a greater stability to the supports. The alternative embodiment shown in Fig. 11 provides greater stability than the support shown in Fig. 7.

[0060] The invention is not limited to the embodiments described above and shown in the figures. The invention is limited only by the appended claims.

[0061] The invention also extends to any combination of measures described above independently of each other.

Claims

1. A carrying body for a demountable support construction, comprising a support surface to be placed on a base and a carrying surface for carrying goods located opposite the support surface, wherein the carrying surface extends between two side surfaces from a first end to a second end of the carrying body, wherein the carrying surface comprises at least one recess extending from a first side face wholly or partly to a second side face of the carrying body for receiving a coupling element in the at least one recess for mutually coupling at least two parallelly placed carrying bodies, wherein the recess comprises two sides directed towards the two respective ends of the carrying body, **characterized in that** a part of the recess is covered on one side.
2. A carrying body according to claim 1, wherein the carrying surface is situated parallel to the supporting surface.
3. A carrying body according to claim 1, wherein the carrying surface has a rectangular shape with two opposite short side edges and two opposite long side edges and wherein the opposite short side edges have an upright edge.
4. A carrying body according to claim 1, wherein the at least one recess forms a recess in the carrying surface and extends partly below the cover.
5. A carrying body according to any one of claims 1 to 4, wherein the carrying body comprises at least two recesses in the carrying surface, each recess being adapted to receive a respective coupling element.
6. A carrying body according to claim 1 or claim 3, wherein the at least one recess extends between two opposite long side edges of the carrying body.
7. A carrying body of claim 1, wherein at least a portion of the recess located below the cover is deeper than at least a portion of the recess not located below the cover.
8. A carrying body according to claim 4, wherein at least a part of the recess which is situated below the carrying surface is deeper than at least a part of the recess which is not situated below the carrying surface.
9. A carrying body according to any one of claims 1 to 8, wherein the carrying surface comprises secondary recesses for receiving support feet of support elements to be placed on the carrying surface.
10. A carrying body according to claim 9, wherein the secondary recesses extend between the two opposite side faces of the carrying body.
11. A carrying body of claim 10, wherein the secondary recesses are shaped as an I providing an interference fit with an insertable element, or as an inverted T, an L, an inverted Y, or any other shape which prevents the support foot from pulling out perpendicular to the carrying surface.
12. A carrying body according to any one of claims 9 to 11, wherein the secondary recesses are provided near one or both of the short side edges of the carrying surface.
13. A carrying body according to claim 1, wherein at least one of a hook lug and a recess is provided at one end of the carrying body for coupling a tensioning strap or tarpaulin.
14. A carrying body according to claim 1, wherein cams are provided on a first side surface on a long side of the carrying body and receiving openings are provided on an opposite second side surface on a long side of the carrying body for receiving the cams of another carrying body when placing carrying bodies against each other.
15. A set of at least two carrying bodies according to one of claims 1 to 14 and a coupling element.
16. A set according to claim 15, comprising at least two coupling elements.
17. A set according to claim 15 or 16, wherein the at least one coupling element is a plank-shaped element with a width and a thickness suitable for receiving the plank-shaped element in the recess and a

length suitable for coupling of at least two carrying bodies placed parallel to each other.

- 18.** A set according to any one of claims 15 to 17, further comprising a cover plate for placement on a coupled set of at least two carrying bodies and at least one coupling element. 5
- 19.** A set according to any one of claims 15 to 18, wherein the at least one coupling element has a smaller width than the width of the carrying body, distance between the two side surfaces thereof, preferably wherein the width of the coupling element is maximum 0.9 times the width of the carrying body, preferably a maximum of 0.8 times, more preferably a maximum of 0.7 times. 10 15
- 20.** A demountable carrying structure formed with a carrying element as mentioned in any one of the preceding claims 1 to 14 or formed with a set according to any one of claims 15 to 18. 20

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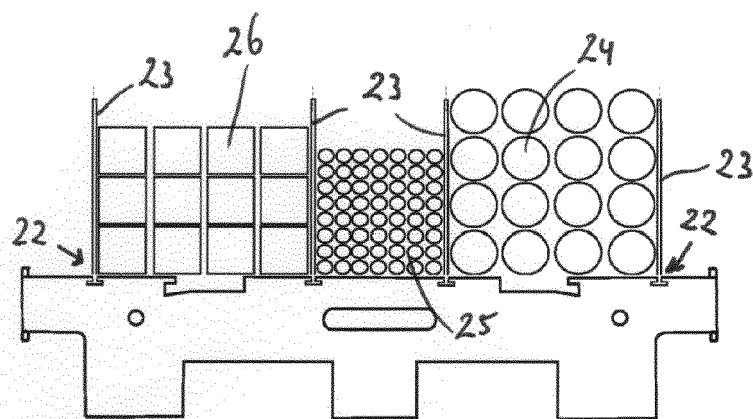
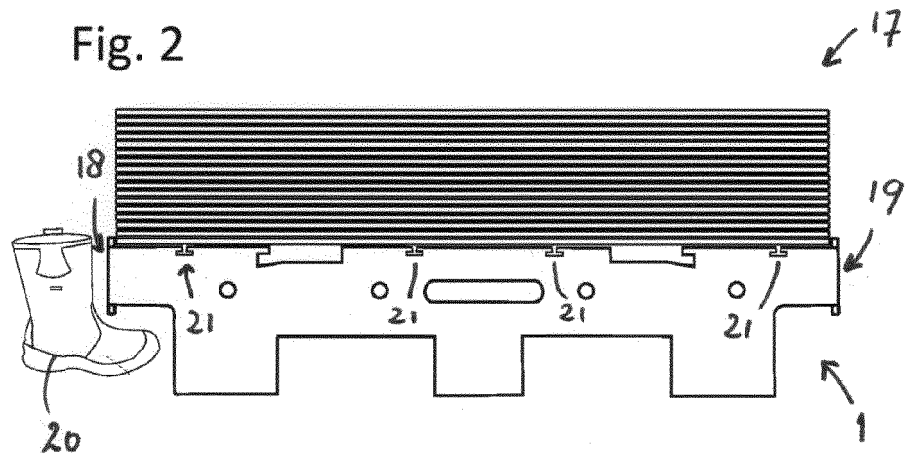
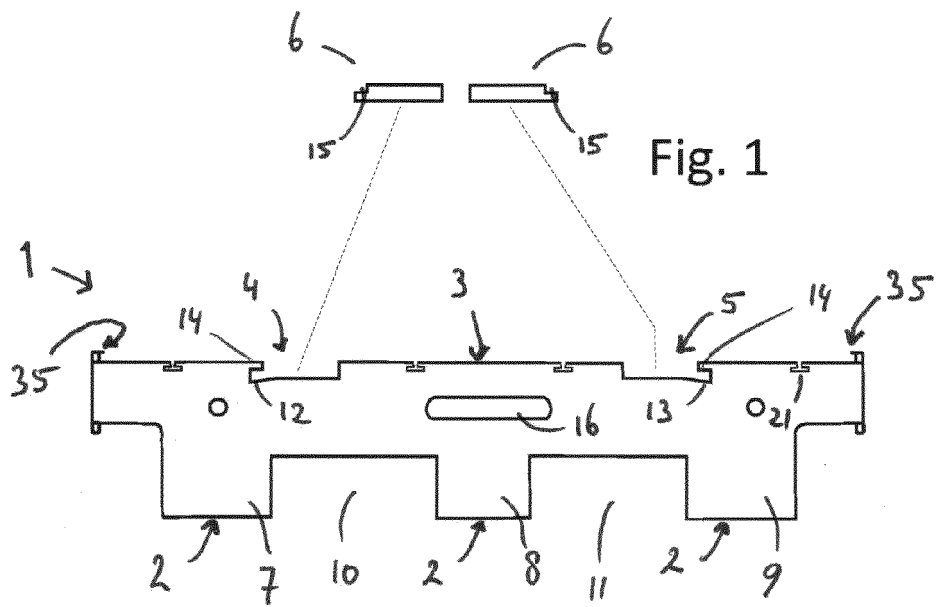
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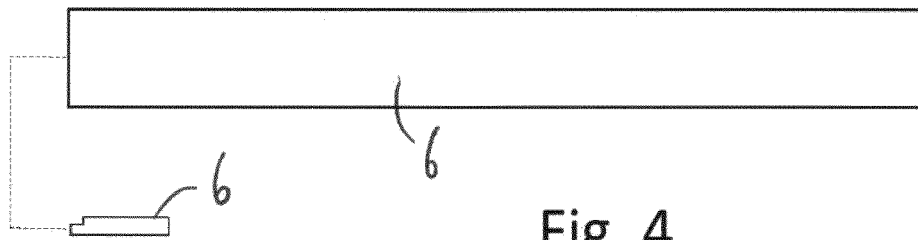


Fig. 4

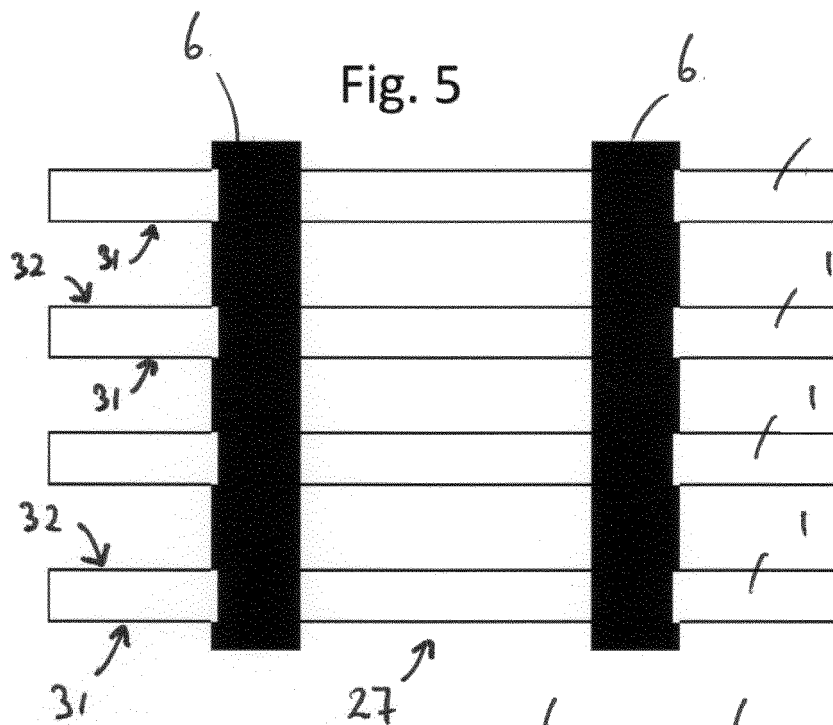


Fig. 5

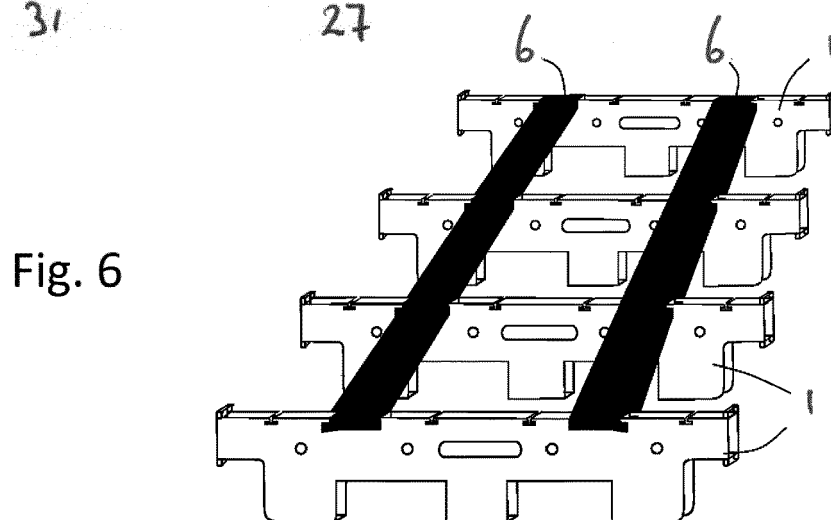


Fig. 6

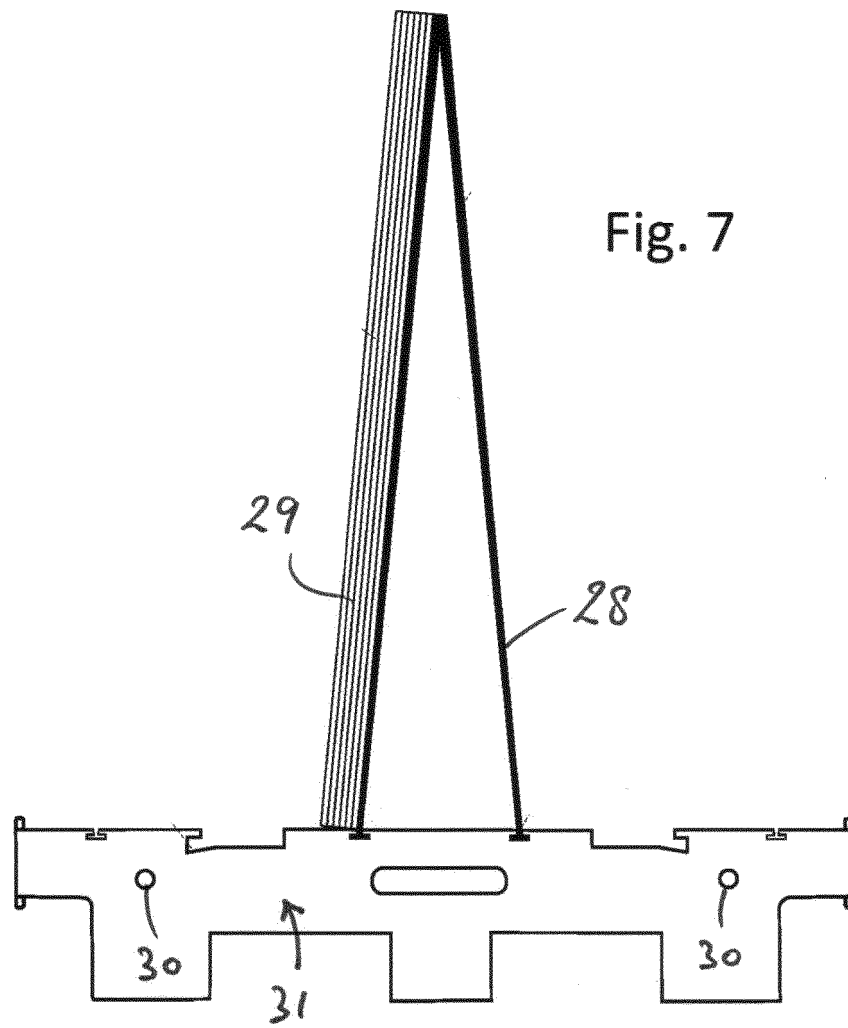


Fig. 8

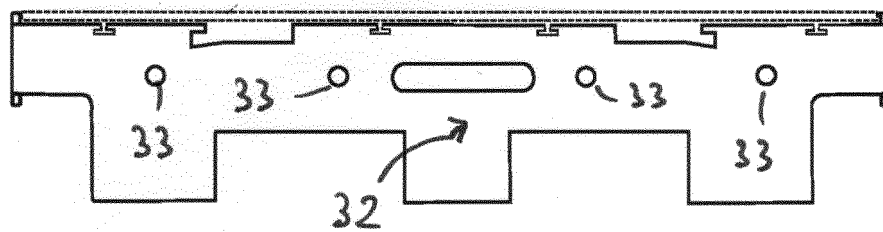


Fig. 9

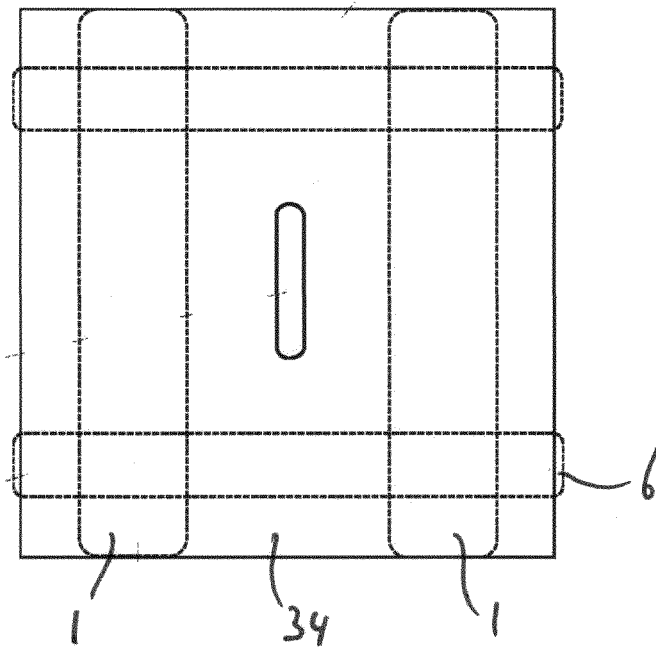
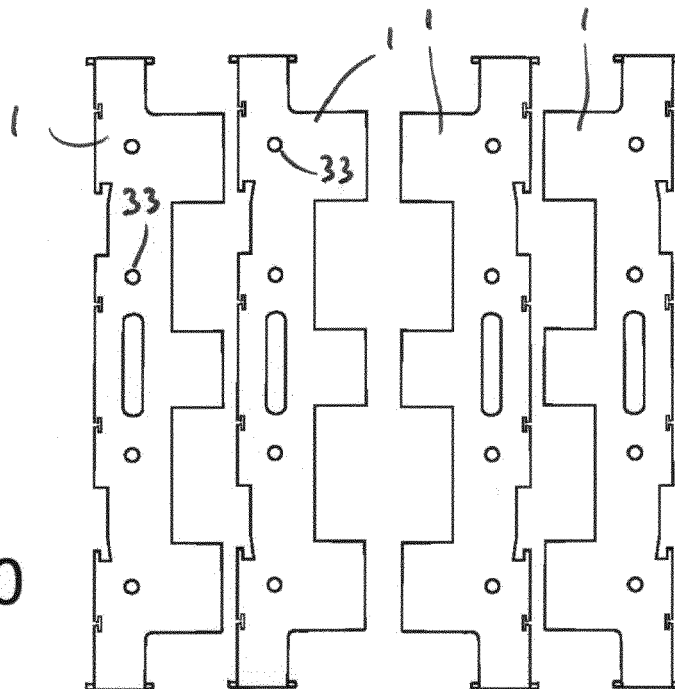
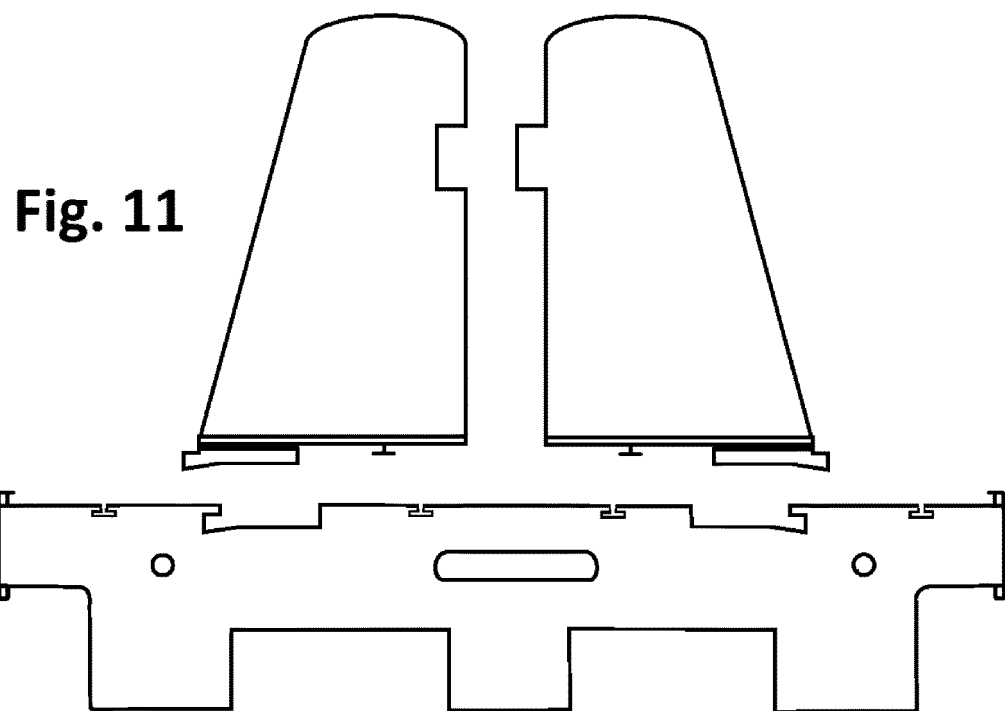


Fig. 10







EUROPEAN SEARCH REPORT

Application Number

EP 21 21 3458

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2013/060900 A2 (AVANTPACK S L [ES]; MARCONELL CARPIO JOSE LUIS [ES] ET AL.) 2 May 2013 (2013-05-02)	1, 2, 4-6, 9-12, 15-17, 20	INV. B65D19/26
Y	* page 2, line 30 - page 7, line 23 * * figures 1-5 *	3, 13, 14, 18, 19	
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