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(54) Pallet

(57) A pallet manufactured from plastic has a load support platform (1) with a substantially planar and smooth load carrying upper side, and, on its underside, hollow feet (2) which are disposed in rows and which are open (5) on the upper side of the load support platform. The feet (2) taper downwardly and have interior, upwardly tapering and downwardly open projections (6). The feet (2) of one pallet are at least partly nestable down into the feet (2) of a subjacent pallet.

In order to improve the mechanical strength of the pallet, it is provided, at the lower ends of the feet (2), with elongate runners (9) which unite the feet (2) within one row. In the load support platform (1) there are disposed along the rows elongate apertures (10) which include the open (5) upper ends of the feet (2). The runners (9) on one pallet are nestable down in the apertures (10) of a subjacent pallet.

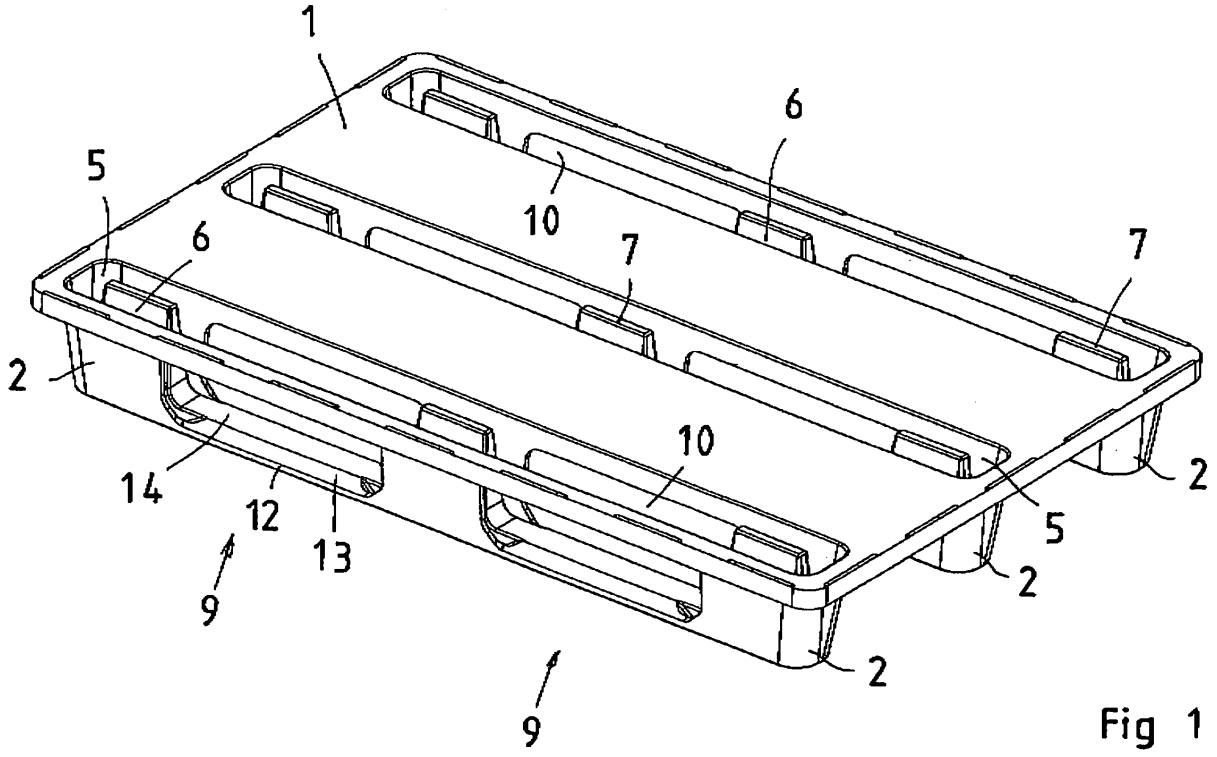


Fig 1

EP 2 067 708 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a pallet of plastic and comprising a load support platform for supporting a load, a number of hollow feet which are disposed in rows on the underside of the load support platform and which are open on the upper side of the load support platform, the feet tapering downwards and displaying interior, upwardly tapering and downwardly open projections, whereby the feet on one pallet are at least partly nestable in the feet of a subjacent pallet.

BACKGROUND ART

[0002] Pallets of numerous different designs, materials and dimensions are previously known in the art. One of the best known is the standardised Europallet which is manufactured from wood. Such a wooden pallet withstands dynamic loadings of up to 1,000 kg and has many fields of use, an so for example it can be employed in pallet stands, stack stores, automated stores, conveyors etc. It can be lifted using standardised lifting equipment and can be conveniently handled from all four sides.

[0003] When new, a Europallet weighs roughly 25 kg, which is 10 kg more than the standard applied by the EU for manual lifting by one person.

[0004] A Europallet which is stored unprotected and outdoors absorbs considerable amounts of water, and so its weight may often be as much as roughly 30 kg.

[0005] The Europallet is not stackable or nestable and so, within a permitted load profile for a road haulage vehicle with a normal load height of 240 cm, only roughly 15 or 16 Europallets will have room stacked on one another. As a result, the space requirements on return transport of empty Europallets are considerable.

[0006] Pallets of plastic are also known in the art, which, on the one hand, are considerably lighter than the above-considered Europallet and moreover may be designed in such a manner that they can be stacked or nested partly in one another.

[0007] DE 20 2004 008 778 U1 discloses a stackable pallet manufactured from plastic. The pallet has a more or less planar upper surface which is provided with large apertures. On the underside of the pallet, there are provided three rows of feet which are open towards the upper side and which taper downwards. Further, on its underside, the pallet according to this publication displays a network of reinforcing stringers or ribs.

[0008] Despite the presence of the reinforcing ribs, such a pallet will not withstand the loading requirements that a Europallet is intended to meet when it is placed in a storage site where the pallet is only supported on two opposing sides. In addition, the reinforcing ribs or the like disposed on the underside will have a negative effect on stackability in such a manner that pallets stacked on one another will nevertheless take up considerable space in the vertical direction.

[0009] EP 1 544 117 A1 discloses another variation on the same theme, where the payload surface of the pallet is designed as a hollow honeycomb structure from which three rows of feet extend downwardly, the feet tapering in a downward direction.

[0010] This pallet suffers in principle from the same drawbacks as that previously described, possibly with the difference that the payload capability is even further reduced.

[0011] EP 0 725 010 A1 discloses yet a further variation on the same theme, namely a pallet with a largely planar upper surface. On the underside of the pallet, there are disposed in a conventional manner three rows of feet whose outer contours taper downwardly. Interiorly in the feet there are provided upwardly directed projections which taper in an upward direction and which have their upper end surfaces flush with the upper side of the pallet.

[0012] This pallet also suffers from shortcomings in terms of mechanical strength, and would not meet the standardised load requirement of 1,000 kp dynamic loading, which is a requirement stipulated for a Europallet of A quality, hence the conventional pallet manufactured from wood.

PROBLEM STRUCTURE

[0013] The present invention has for its object to develop the pallet intimated by way of introduction such that it is capable of meeting the standardised loading requirements which apply to A quality Europallets. The present invention further has for its object to design the pallet intimated by way of introduction so that it may be stacked with extremely compact vertical dimensions. Finally, the present invention has for its object to design the pallet such that its weight will be considerably less than that of a conventional wooden pallet and that it can be manufactured at low cost and from recyclable materials.

SOLUTION

[0014] The objects forming the basis of the present invention will be attained if the pallet intimated by way of introduction is characterised in that there are provided, in the region of the lower end of the feet, and within the rows, elongate runners that connect the feet within a row, that there are provided, in the load platform along the rows, elongate apertures which include the upper open ends of the feet, and that the runners on a pallet are nestable through these elongate apertures on a subjacent pallet.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0015] The present invention will now be described in greater detail hereinbelow, with reference to the accompanying Drawings. In the accompanying Drawings:

Fig. 1 shows a first embodiment of the pallet according to the present invention seen obliquely from above;

Fig. 2 is a perspective view of the pallet according to Fig. 1, but seen from a different angle;

Fig. 3 shows straight side elevations of the pallet seen, on the one hand, from the short end, and, on the other hand, from the longitudinal side;

Fig. 4 shows the pallet according to Fig. 1 seen from beneath, in perspective;

Fig. 5 is a partial magnification of the view according to Fig. 4; and

Fig. 6 shows a second embodiment of a pallet, seen in perspective obliquely from beneath.

DESCRIPTION OF PREFERRED EMBODIMENT

[0016] The pallet according to the present invention is manufactured in one continuous piece by injection moulding of a recyclable plastic, such as polyethylene or polypropylene. This implies that the pallet, once it has been decommissioned and cleaned, can be ground down into plastic granulate, which is recycled.

[0017] It will be apparent from Figs. 1 to 3 taken as a whole that the pallet according to the present invention has a load support platform 1, with a substantially planar and smooth upper side. The load support platform I has, on its underside, feet 2 which are arranged in three rows, with three feet in reach row.

[0018] Seen from the longitudinal side, the pallet has openings 3 for the insertion of, for example, the forks of a fork lift truck. From the short end, there are corresponding openings or spaces 4 between the rows of feet 2. The foregoing implies that the pallet can be handled from all four sides with equal ease.

[0019] The feet 2 are hollow and open up towards the upper side of the support platform 1 so that there is formed at this position openings 5 through the support platform 1. The side walls of the feet 2 converge in a downward direction, so that the feet will have a smaller cross sectional dimension at the bottom than that which applies to the above-mentioned openings 5. This entails that a foot 2 on one pallet may be passed down through one opening 5 in a subjacent pallet so that these will thereby become stackable or nestable.

[0020] From the lower regions of the feet 2, there extend upwardly directed projections 6 which are hollow and open in a downward direction and which taper in an upward direction. This implies that one such projection 6 on a pallet can interiorly accommodate a corresponding projection on a subjacent pallet. Thus, the projections 6 do not prevent stacking or nesting of the pallets on and partly in one another.

[0021] The projections 6 have planar upwardly facing surfaces 7 which suitably lie flush with the upper side of the support platform 1.

[0022] One key object of the present invention is as large a payload as possible for the pallet. For this reason, the pallet one has, on its underside, a reinforcing structure 8 intended to impart to the support platform 1 a high degree of mechanical strength and rigidity. In practical designs, this reinforcement structure is formed as a honeycomb structure where the height (in the thickness or vertical direction of the support platform) approximately amounts to half of the transverse dimension of the hexagonal walls which surround each cell in the honeycomb structure. In one practical version, the total thickness of the reinforcing structure and the upper defining surface of the support platform 1 lies in the order of magnitude of between 30 and 40 mm.

[0023] According to the present invention, the feet 2 disposed in a row are united at their lower end regions by the intermediary of runners 9 (Figs. 1, 3 and 4). As a result, three feet 2 included in a row, the runners 9 and the adjacent portions of the support platform 1 can be likened to a lattice girder standing on edge, which has an extremely large payload capacity.

[0024] In order to maintain the stackability or nestability of the pallet, the support platform 1 displays elongate apertures 10 extending along the rows of feet 2 and including the open ends 5 of the feet 2. The elongate apertures extending along the rows of feet are dimensioned in such a manner that the runners 9 on one pallet can be passed down through these elongate apertures 10 on stacking of two pallets on or in one another.

[0025] In the currently preferred embodiment, the runners 9 include rib structures 11 which are located at the lower side edges of the feet 2 facing away from one another, hence along opposing longitudinal sides of each runner 9. These rib structures 11 have outer portions 12 which lie flush with the outer surfaces of the feet 2 at the lower regions of the feet. Further, the rib structures 11 included inner portions 13 which lie in the same plane as the side walls of the upwardly directed projections at lower regions thereof. This implies that the rib structures 11, at least along a part of their longitudinal extent, display U-shaped, upwardly open cross section.

[0026] The inner portions 13 of the rib structures 11 are, along their upper edges, united by the intermediary of wall sections 14 which, at their ends, are united to the side walls of two neighbouring upwardly directed projections 6.

[0027] It was mentioned above that the rib structures 11 have U-shaped, upwardly open cross section. The bottom walls 15 of these cross sections extend past the feet 2 and form their downwardly facing undersides (Figs. 4 and 5). At the feet, the bottom portions 15 bridge the distance in the width direction between the peripheral walls of the feet and the walls of the upwardly direction projections 6.

[0028] There may possibly be provided reinforcing

springs 16 at the lower parts of the feet 2, between the insides of the feet and the outsides of the upwardly directed projections 6 disposed in the feet. However, these reinforcing springs should not project excessively in the vertical direction, since this would impede the possibility of stacking or nesting a plurality of pallets in one another.

[0029] The rib structures 11 of the bottom walls 15 may, as is most clearly apparent from Fig. 5, have apertures 17 between neighbouring feet.

[0030] Fig. 6 illustrates a slightly modified embodiment of the pallet according to the present invention. The design of the feet 2 and their upwardly directed projections 6 corresponds to that described above. The same applies to the elongate apertures 10 in the upper side of the support platform 1.

[0031] However, the rib structures 11 in a runner 9 are, according to Fig. 6, united to one another via an intermediate portion 18 so that the runner will be closed downwards apart from those apertures which are provided at the lower ends of the upwardly directed projections 6. As a result, this embodiment lacks the above-mentioned wall portion 14 between 2 neighbouring upwardly directed projections 6.

Claims

1. A pallet manufactured of plastic and comprising a load support platform (1) for supporting a load, a number of hollow feet (2) which are disposed in rows on the underside of the load support platform and which are open (5) on the upper side of the load support platform, the feet tapering downwards and displaying interior, upwardly tapering and downwardly open projections (6), whereby the feet on one pallet are at least partly nestable in the feet of a subjacent pallet, **characterised in that** there are provided, in the region of the lower end of the feet (2), and within the rows, elongate runners (9) that connect the feet within a row, that there are provided, in the load support platform (1) along the rows, elongate apertures (10) which include the upper open (5) ends of the feet, and that the runners on a pallet are nestable through these elongate apertures on a subjacent pallet.

2. The pallet as claimed in Claim 1, **characterised in that** the load support platform (1) has a substantially planar and smooth upper side, while its lower side includes a reinforcing structure (8).

3. The pallet as claimed in Claim 2, **characterised in that** the reinforcing structure (8) is in the form of a honeycomb structure.

4. The pallet as claimed in any of Claims 1 to 3, **characterised in that** the runners (9) include portions (12) which lie in the same plane as the side walls of the feet (2).

5. The pallet as claimed in any of Claims 1 to 4, **characterised in that** the runners (9) include portions (13) which lie in the same plane as the side walls of the upwardly directed projections (6).

6. The pallet as claimed in ay of Claims 1 to 5, **characterised in that** the runners (9), in the regions of the feet (2), include bottom walls (15) for the feet.

7. The pallet as claimed in any of Claims 1 to 6, **characterised in that** the runners (9) include two rib structures (11), one on each longitudinal side of the runner.

8. The pallet as claimed in any of Claims 1 to 7, **characterised in that** two rib structures (11) included in a runner (9) in the same row of feet (2) are united between the feet via lower wall portions (14) which are substantially parallel with the upper side of the pallet.

9. The pallet as claimed in Claim 8, **characterised in that** the lower wall portions (14) at their opposing ends are united with short sides of the upwardly directed projections (6) in the feet (2).

10. The pallet as claimed in any of Claims 1 to 9, **characterised in that**, between the insides of the feet (2) and the outsides of the upwardly directed projections (6) disposed in the feet, there extend reinforcing portions (16) in the lower regions of the feet.

11. The pallet as claimed in any of Claims 1 to 10, **characterised in that** the upwardly directed projections (6) have upper end surfaces (7) which lie in the same plane as the upper side of the pallet.

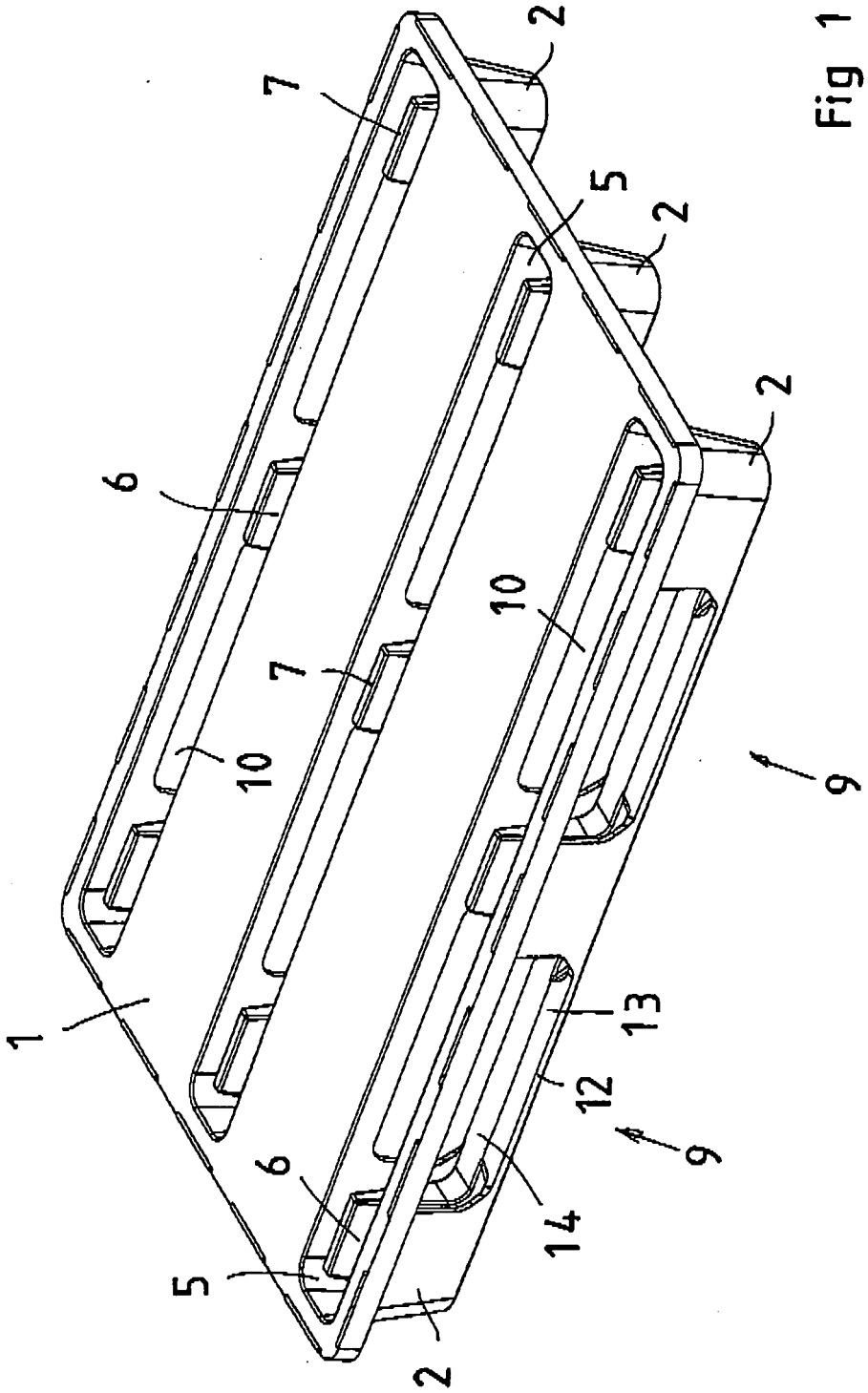


Fig 1

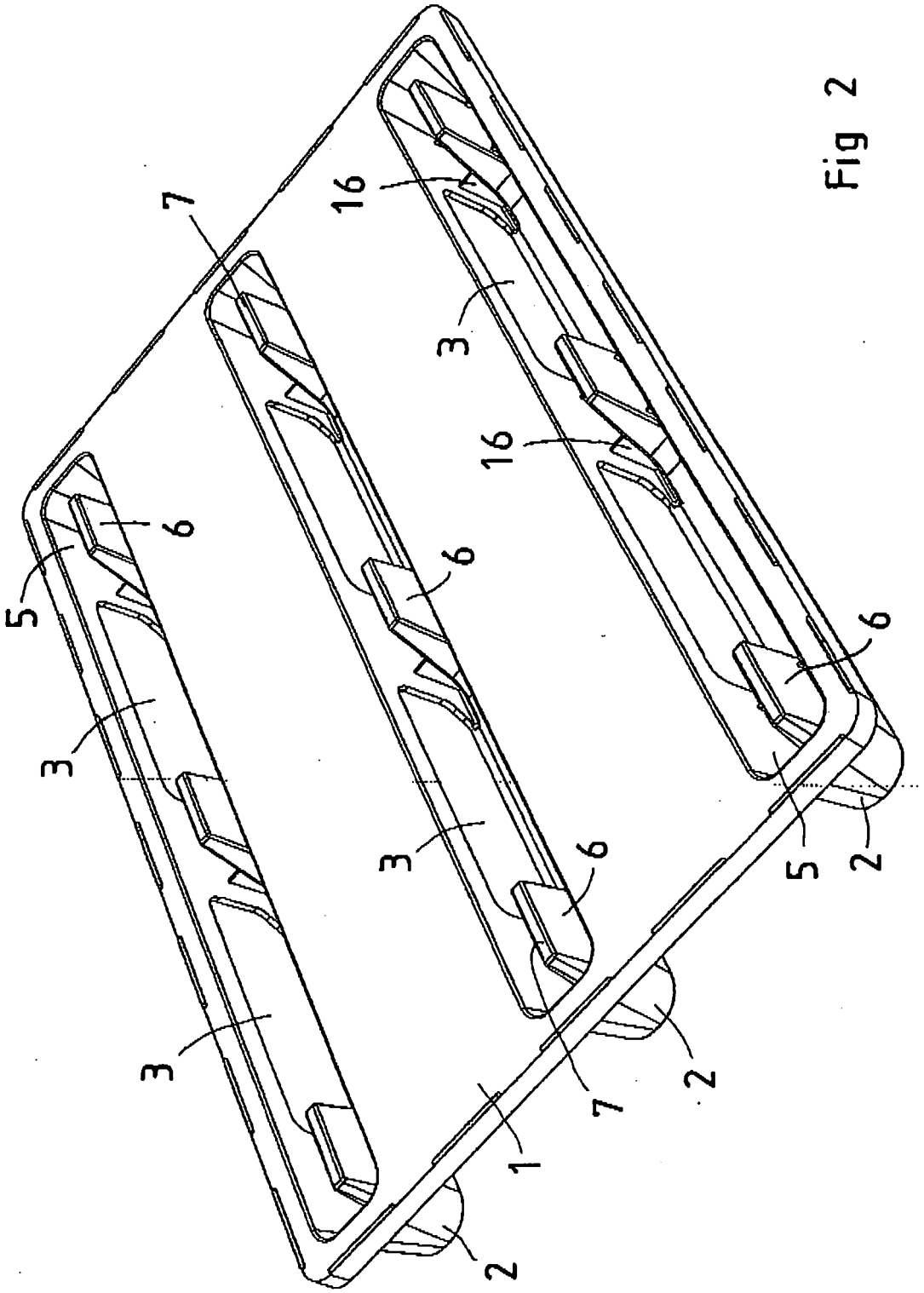
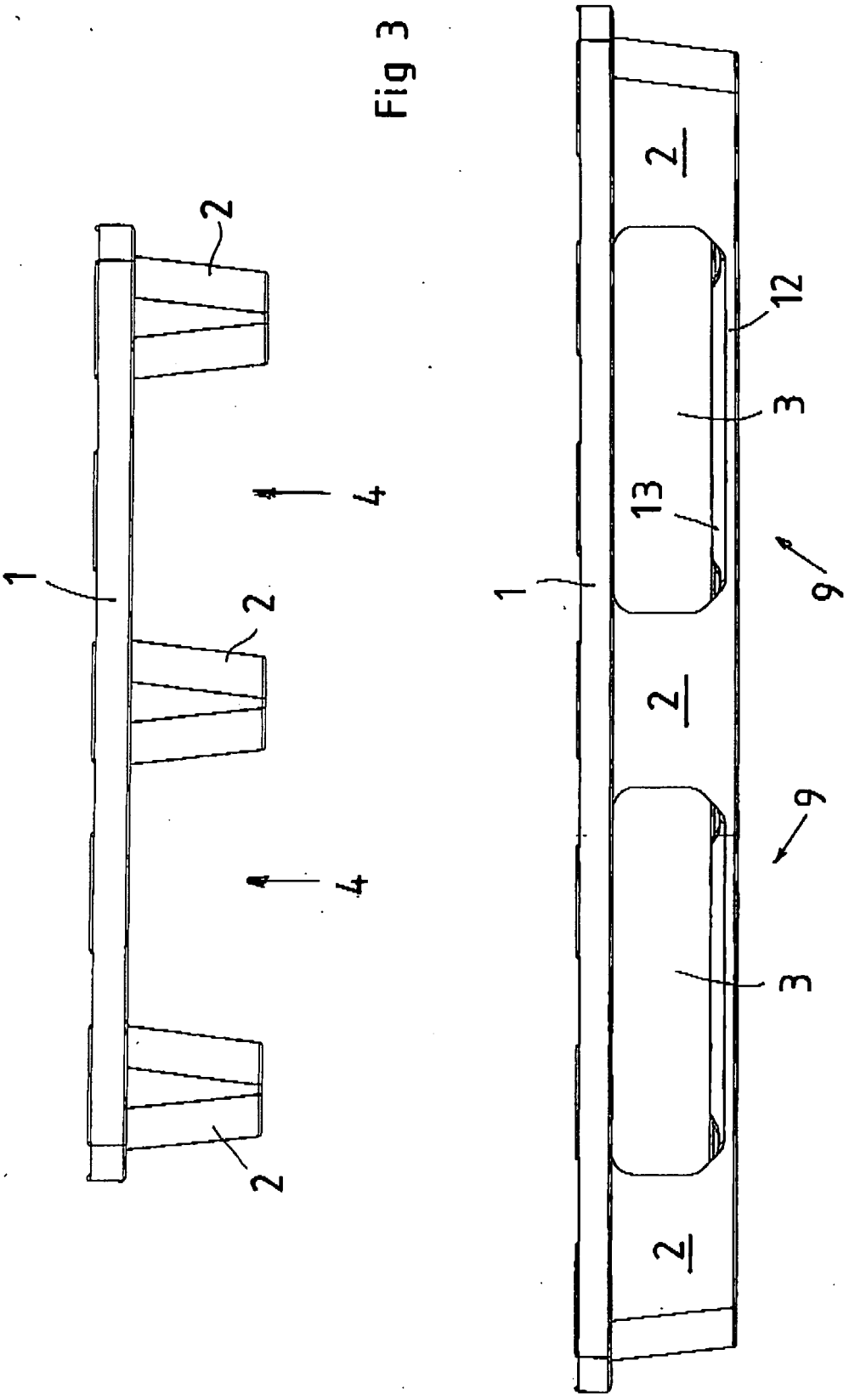


Fig 2

Fig 3



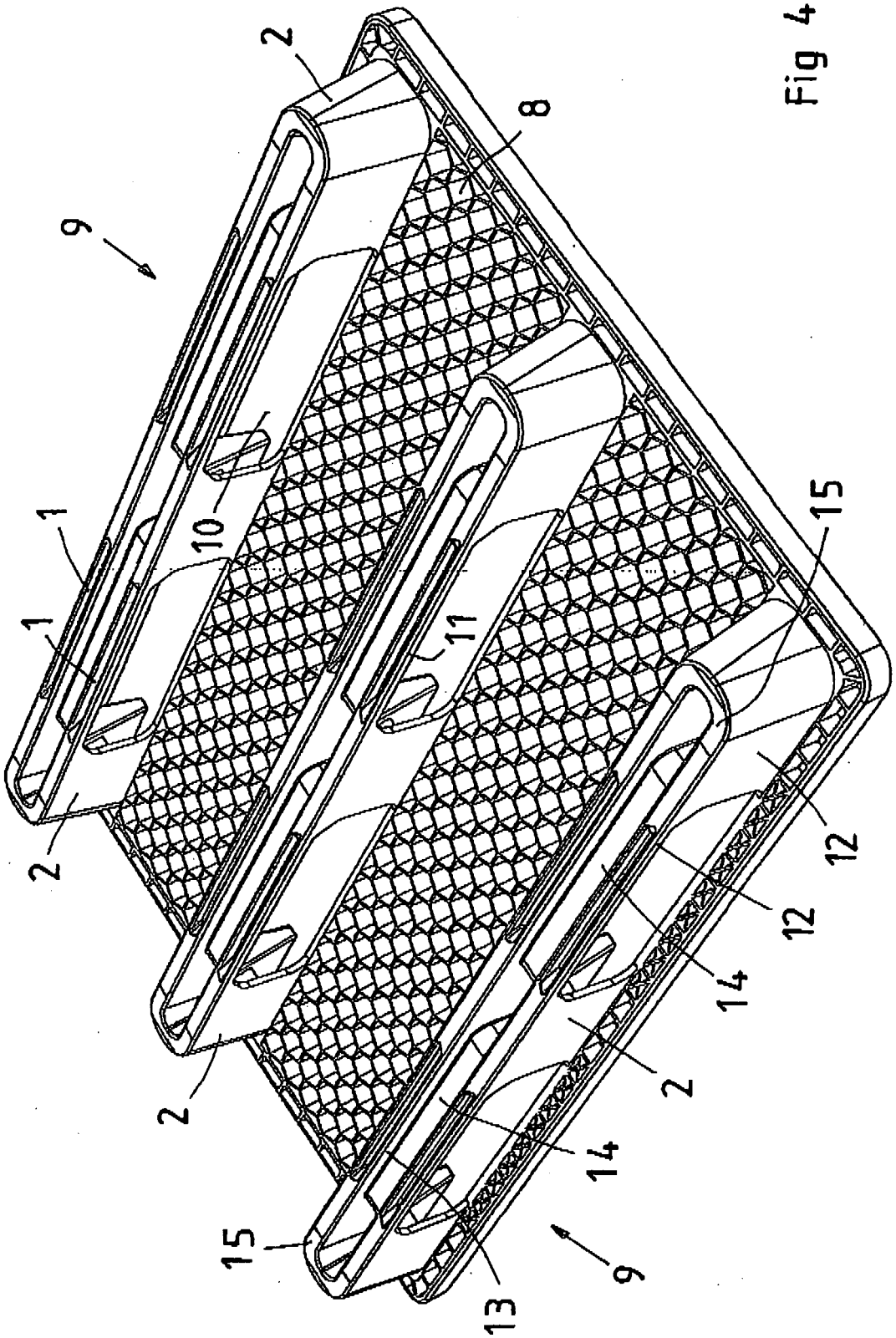


Fig 4

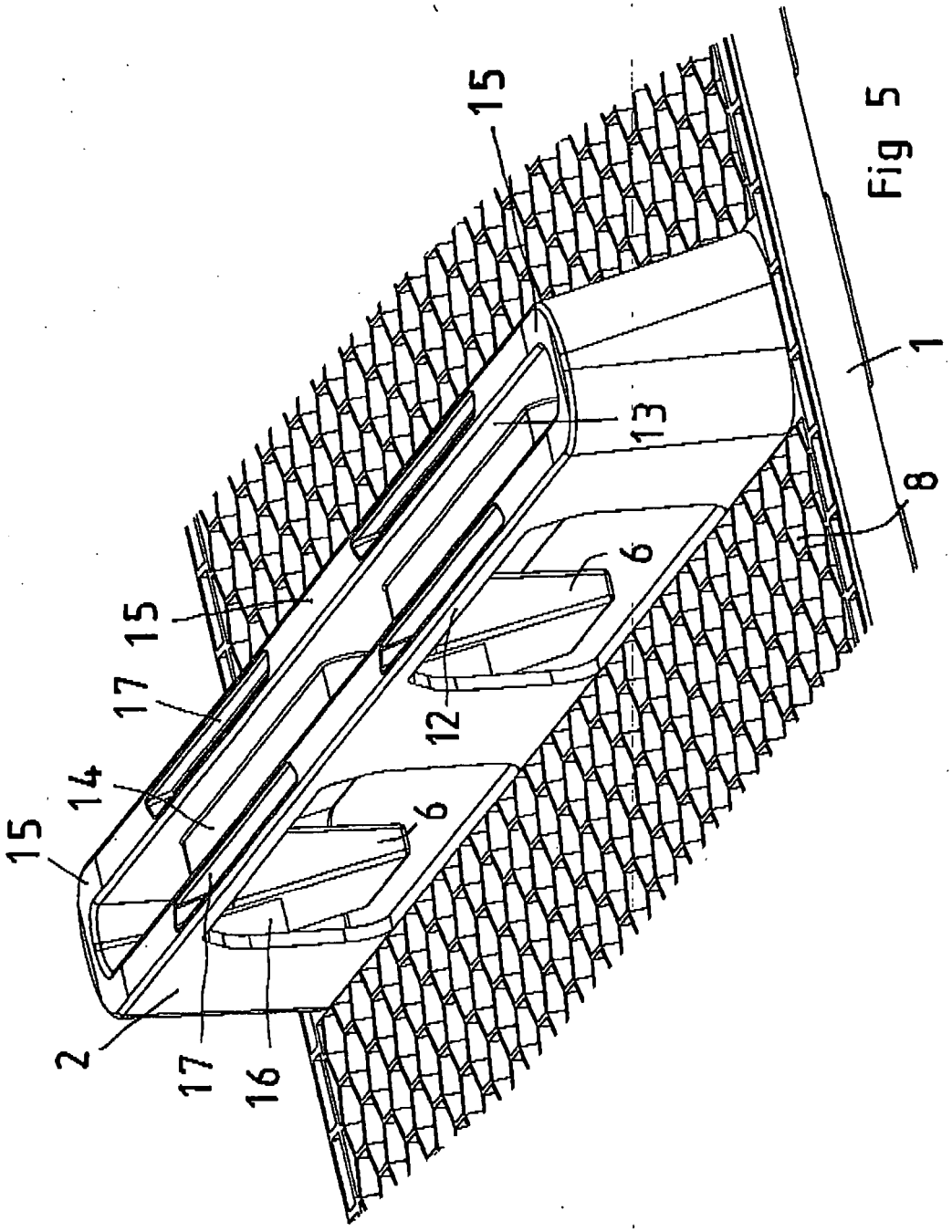


Fig 5

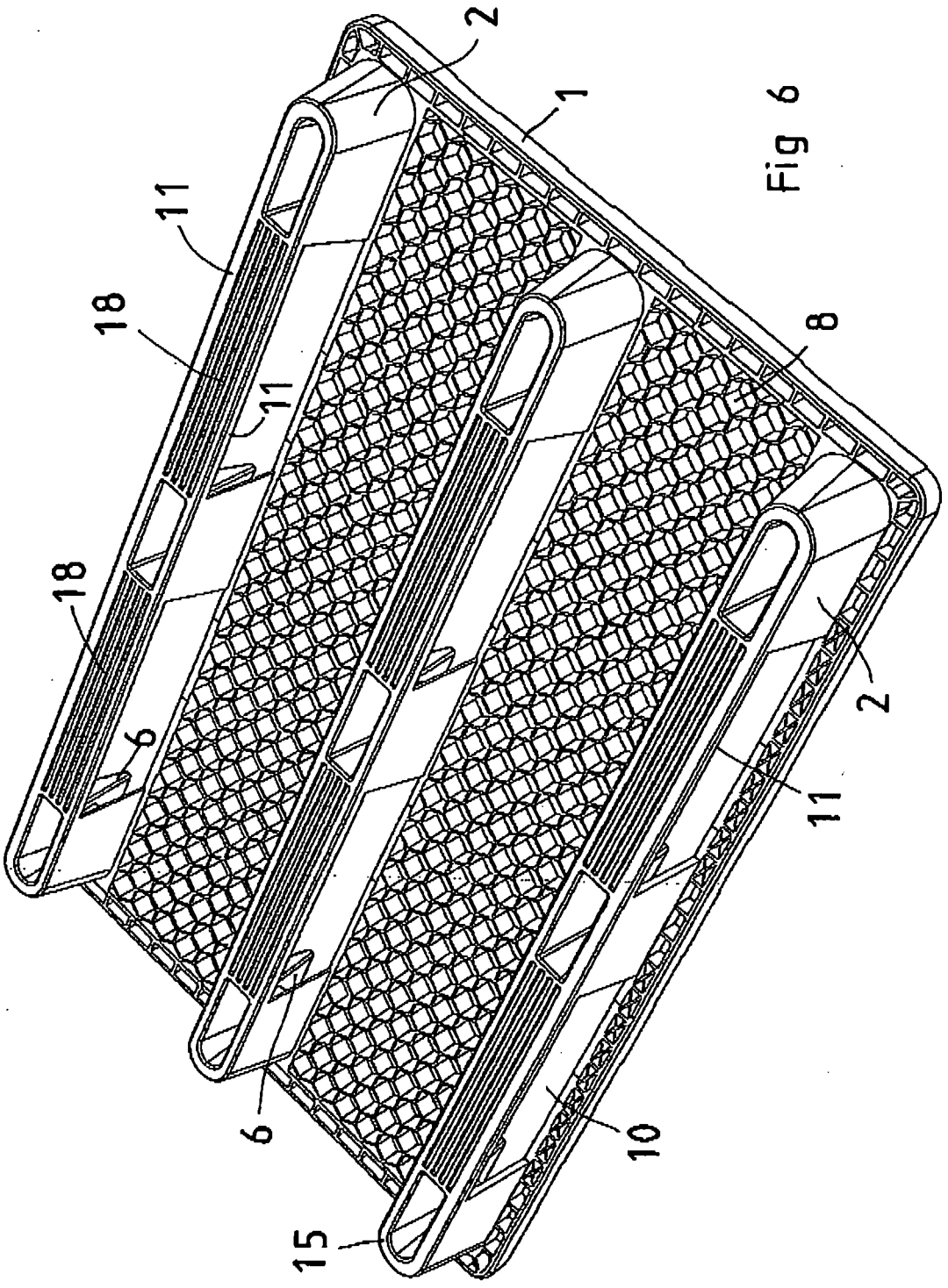


Fig 6

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EUROPEAN SEARCH REPORT

Application Number
EP 08 01 9341

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 2007/069034 A (INTER IKEA SYS BV [NL]; PERSSON BO [SE]) 21 June 2007 (2007-06-21) * the whole document *	1-11	INV. B65D19/00
A	NL 7 017 308 A (FURNIER ET AL.) 7 March 1972 (1972-03-07) * figure 1 *	1-11	
A	DE 299 02 790 U1 (VOELKER HARALD [DE]) 29 April 1999 (1999-04-29) * the whole document *	1-11	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 March 2009	Vigilante, Marco

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 01 9341

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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23-03-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2007069034 A	21-06-2007	AU 2006325093 A1	21-06-2007
		CN 101336196 A	31-12-2008
		DK 176570 B1	15-09-2008
		EP 1973787 A2	01-10-2008
NL 7017308 A	07-03-1972	AT 311870 B	10-12-1973
		AU 459062 B2	13-03-1975
		AU 3245971 A	22-02-1973
		BE 760509 A1	27-05-1971
		CA 952447 A1	06-08-1974
		CH 533552 A	15-02-1973
		CS 185563 B2	31-10-1978
		DE 2043832 A1	18-11-1971
		DK 144211 B	18-01-1982
		FI 54786 B	30-11-1978
		FR 2105274 A5	28-04-1972
		GB 1320804 A	20-06-1973
		IE 35544 B1	18-03-1976
		JP 51018701 B	11-06-1976
		NO 140175 B	09-04-1979
		ZA 7103267 A	23-02-1972
DE 29902790 U1	29-04-1999	NONE	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- DE 202004008778 U1 **[0007]**
- EP 1544117 A1 **[0009]**
- EP 0725010 A1 **[0011]**