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(54) **PREFORMED MODULES TO
MANUFACTURE PALLETS AND PALLETS
OBTAINED THEREFROM**

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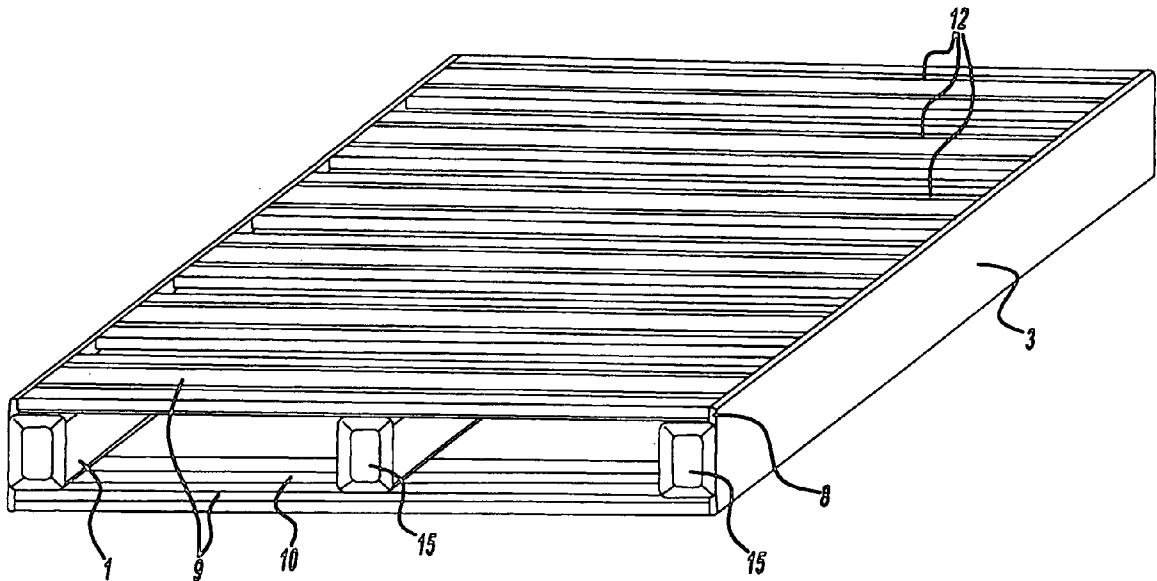
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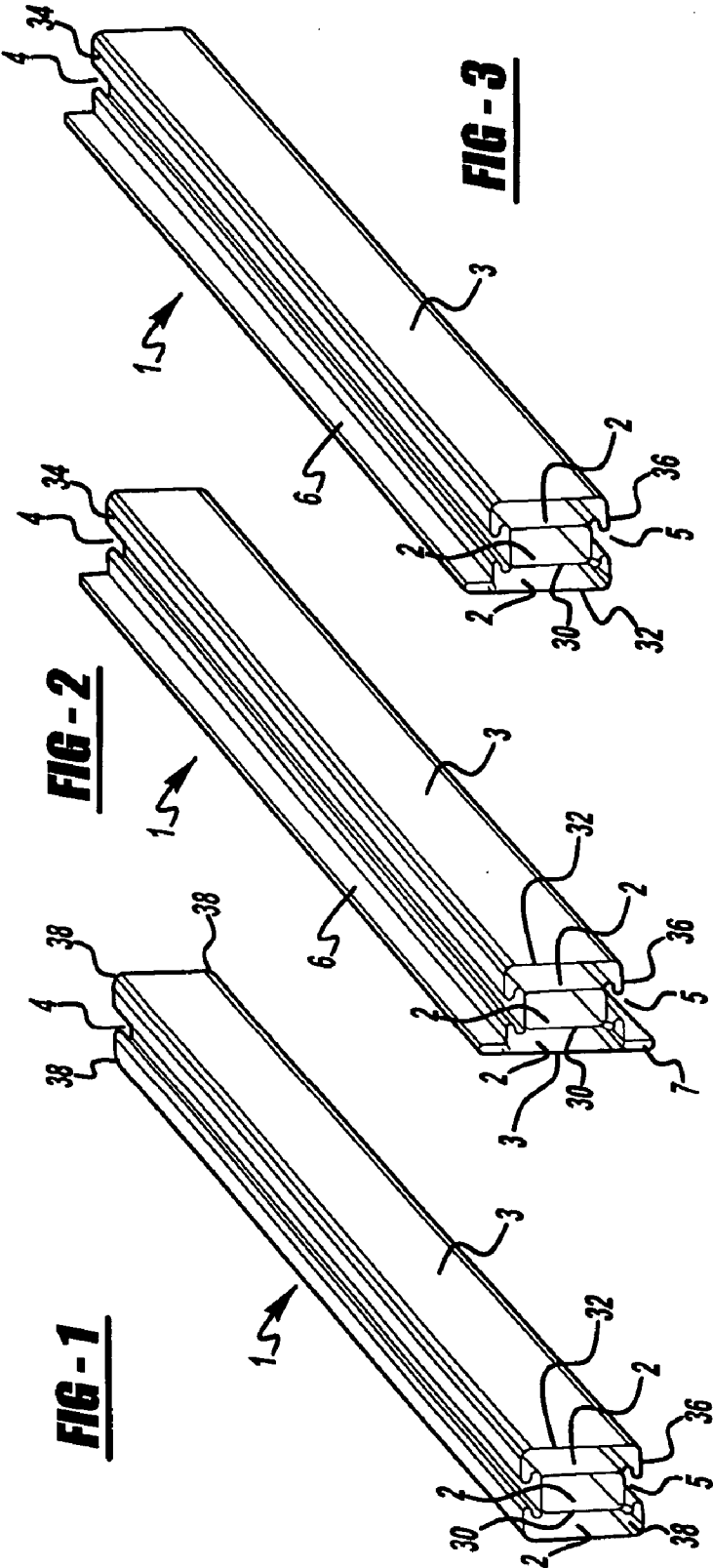
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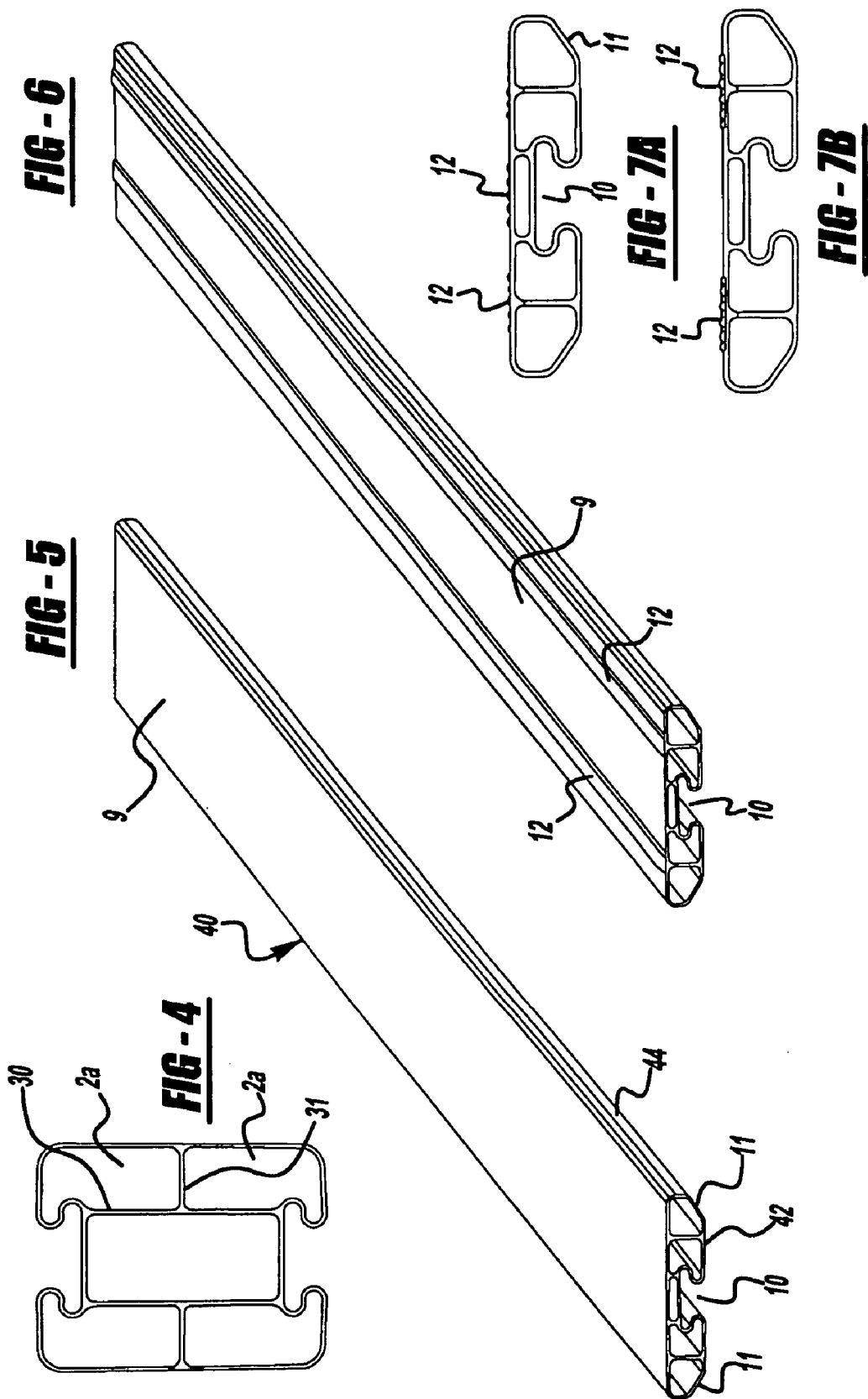
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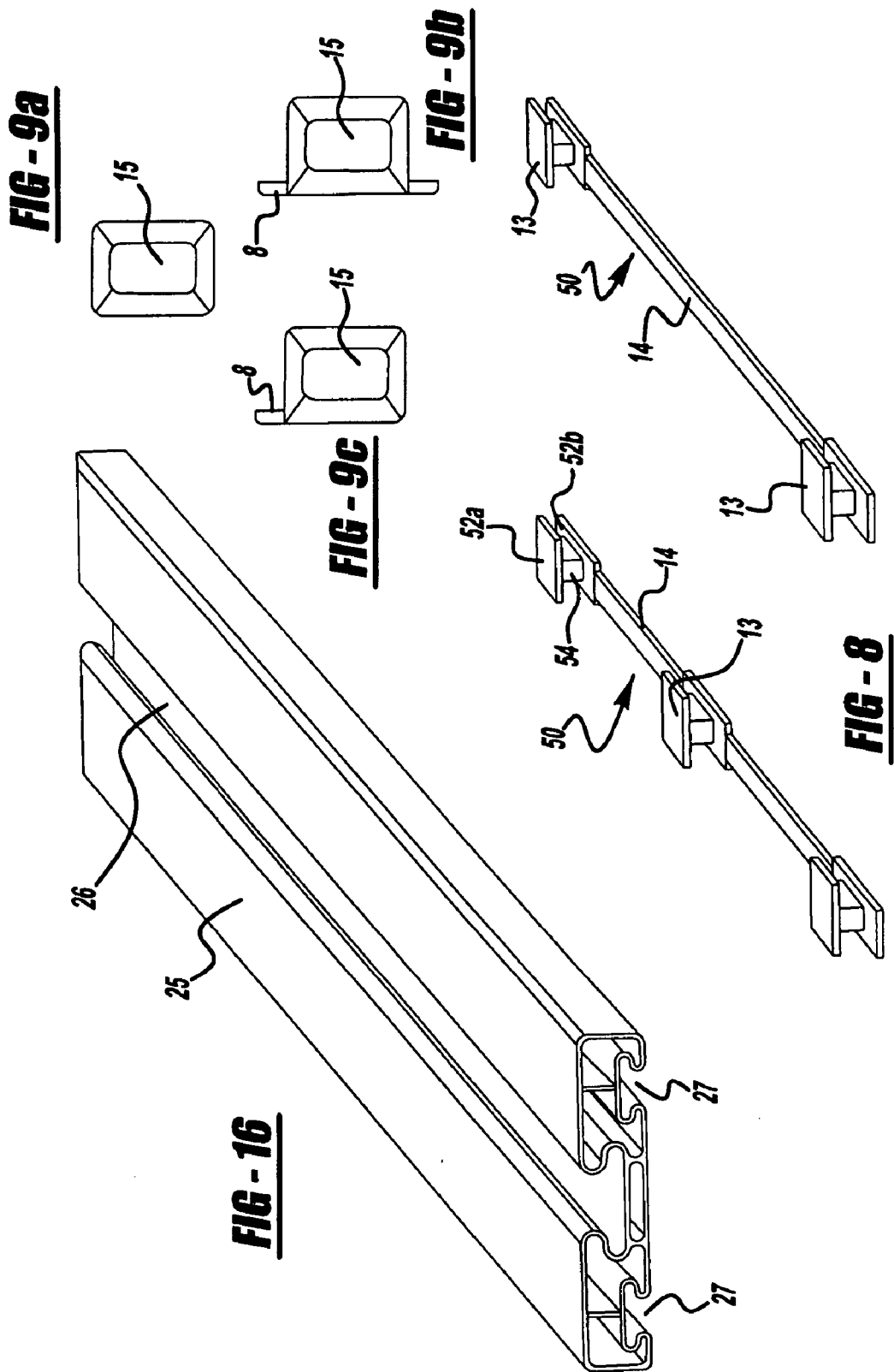
(57) **ABSTRACT**

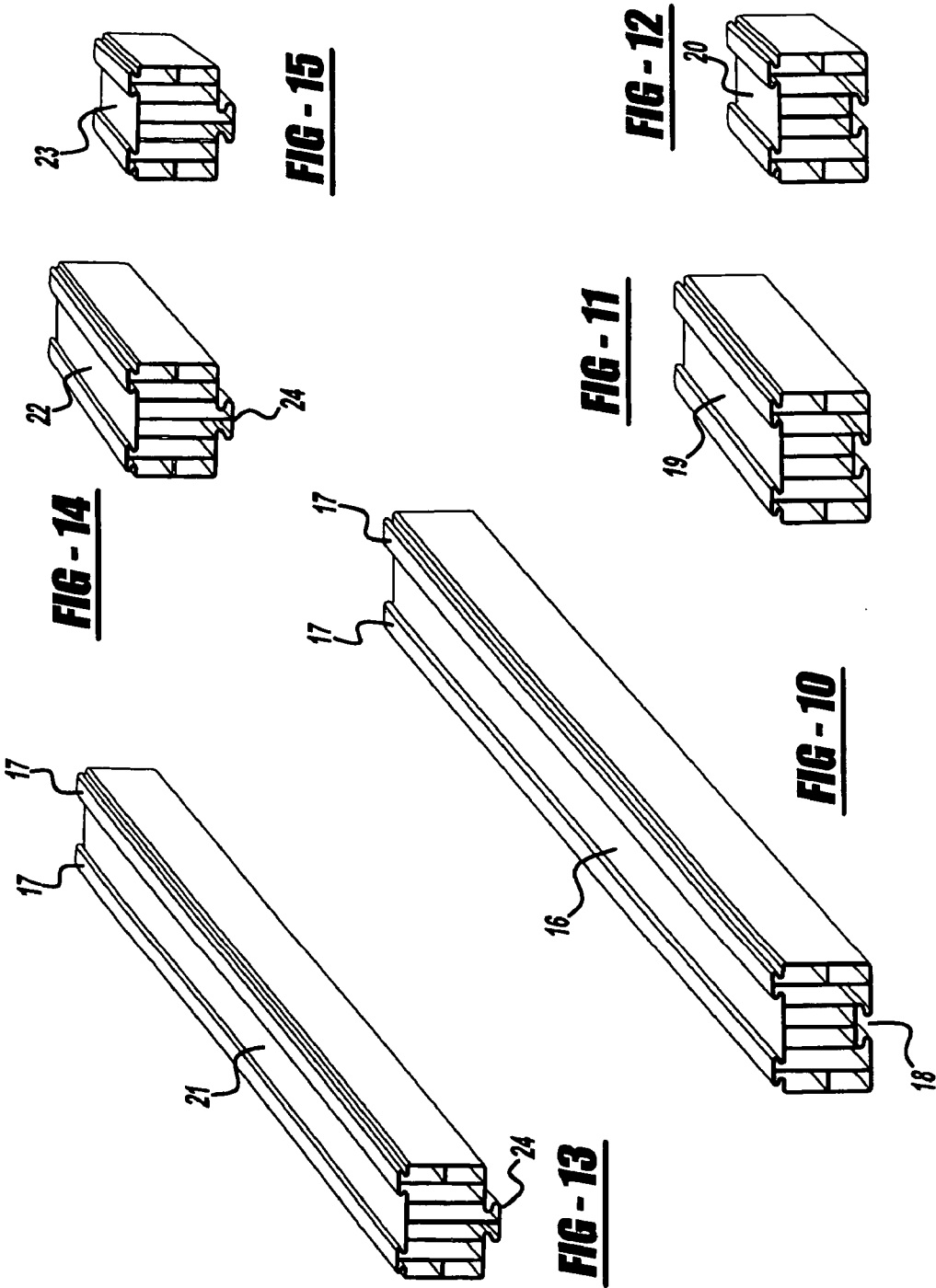
Preformed modules for making pallets include basic crossbar profiles and additional long and short crossbar profiles, basic and additional board profiles, and connection fittings. Each crossbar profile includes a preformed body having a cross section with a framework of laminar baffles, which define a plurality of cells, a perimetric covering, and longitudinally extending engagement elements. Each of the basic and additional board profiles is laminated and includes a plurality of cells, a perimetric covering, and at least one longitudinal engagement element on the perimetric cover. The crossbar profiles support the board profiles by means of the connection fittings. A pallet includes some or all of the modules described above.











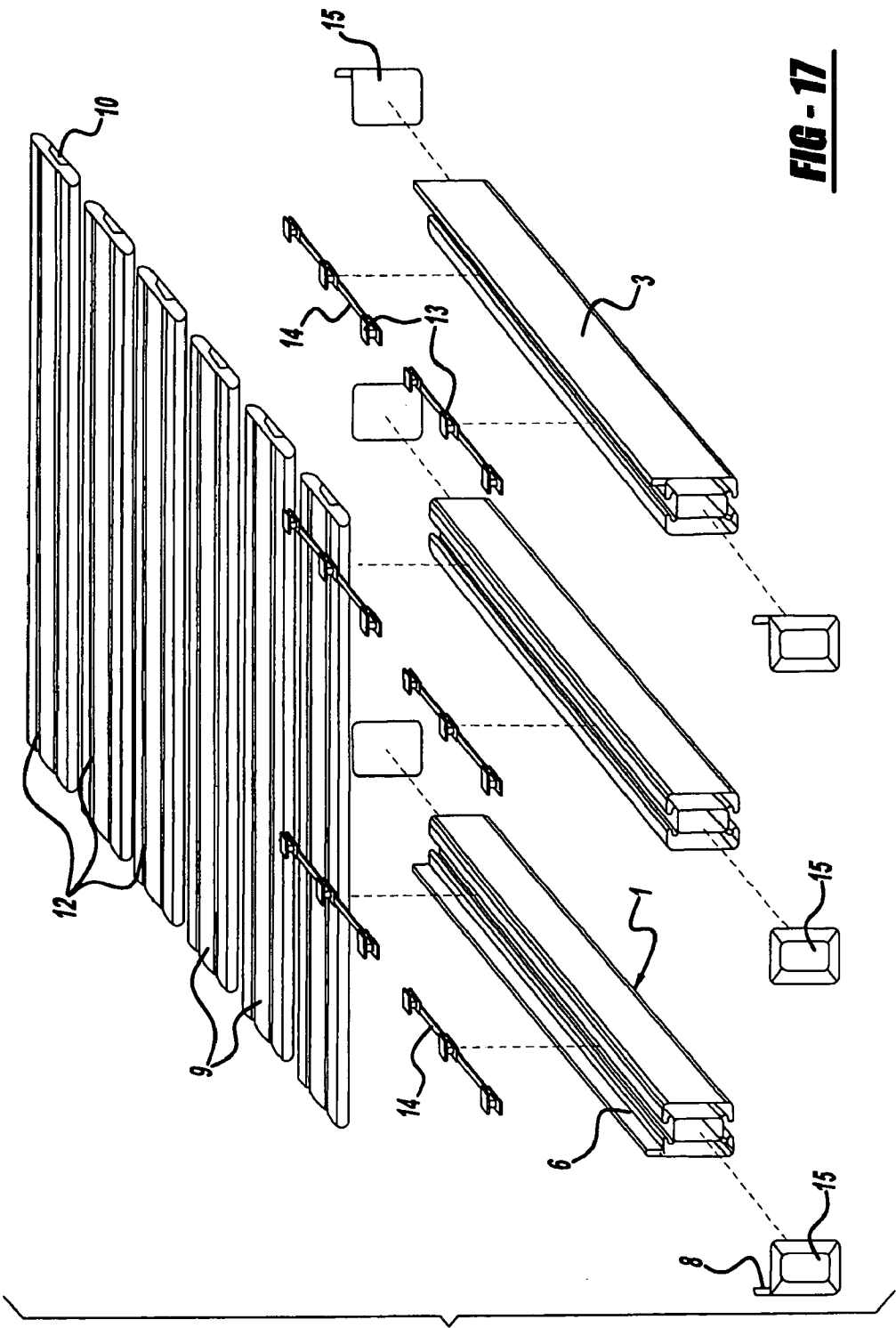
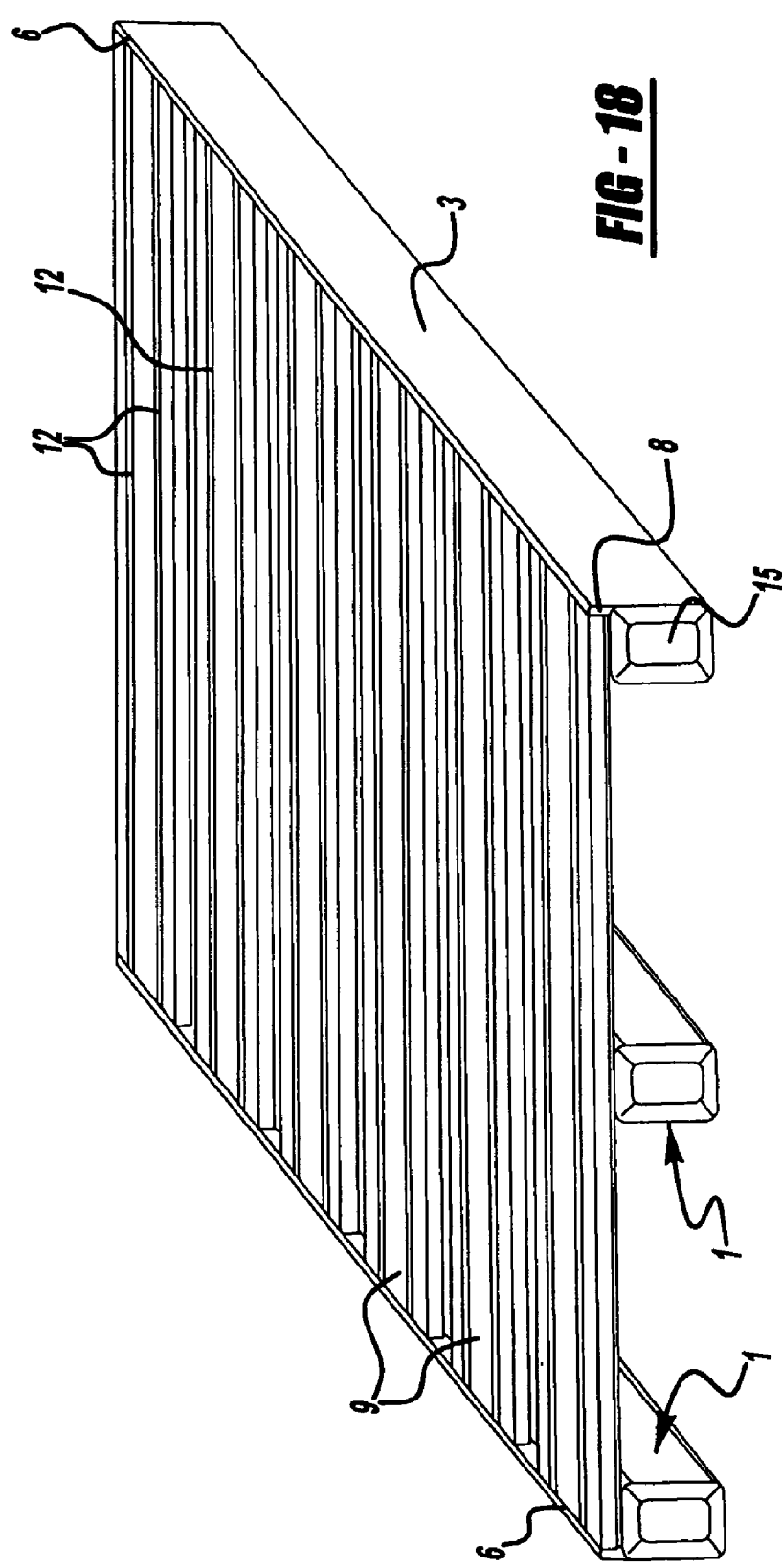
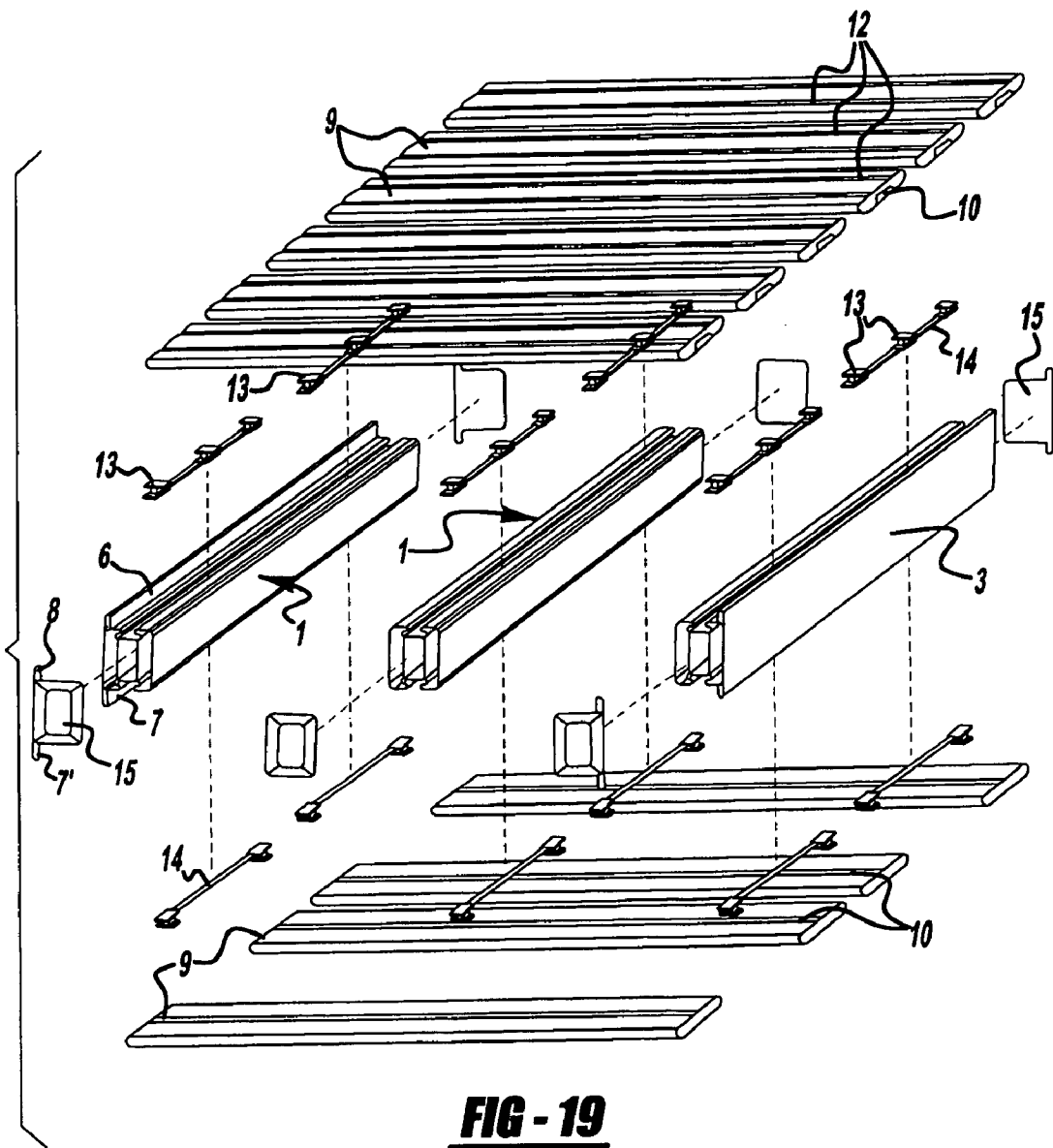
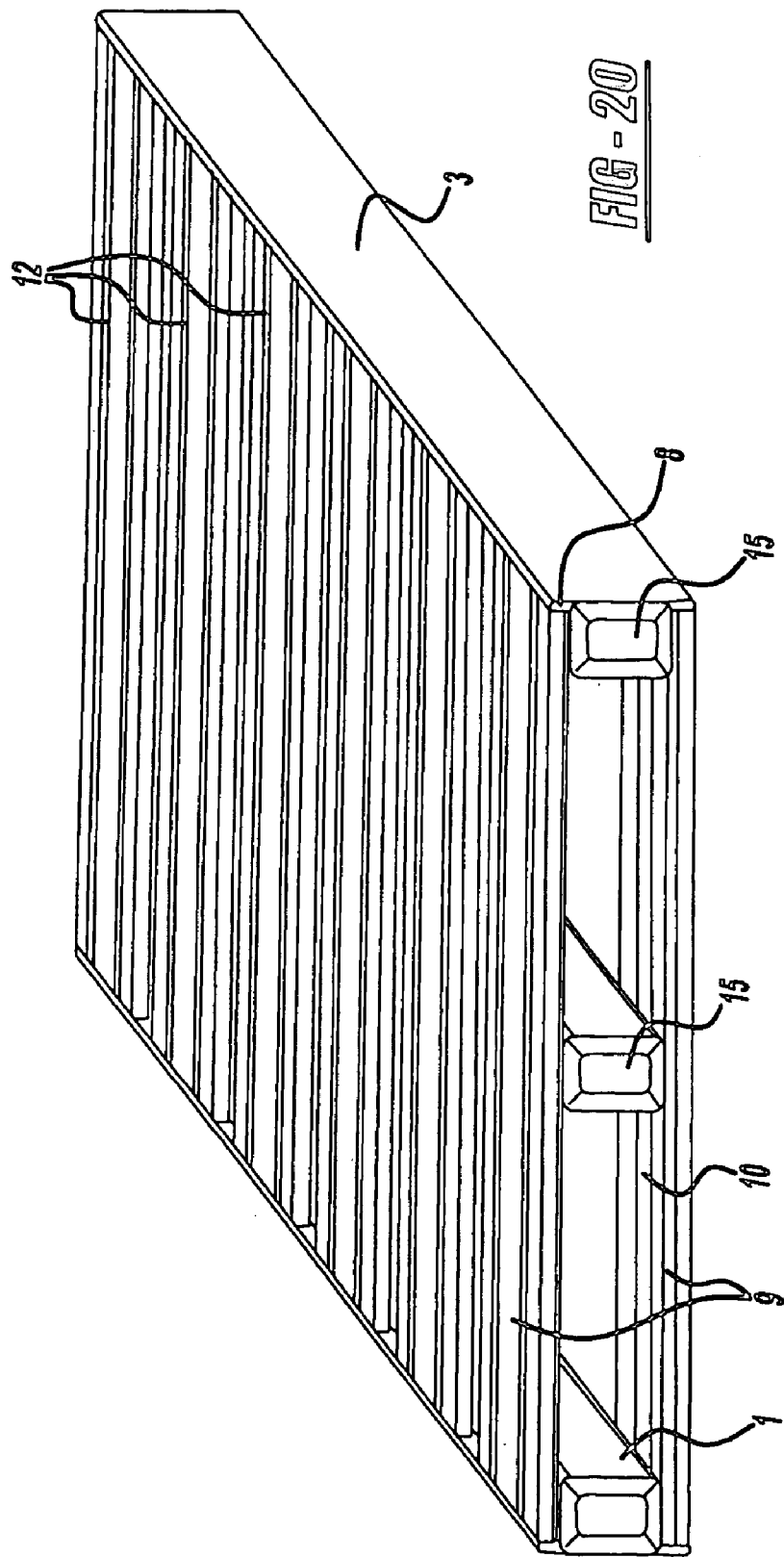


FIG - 17







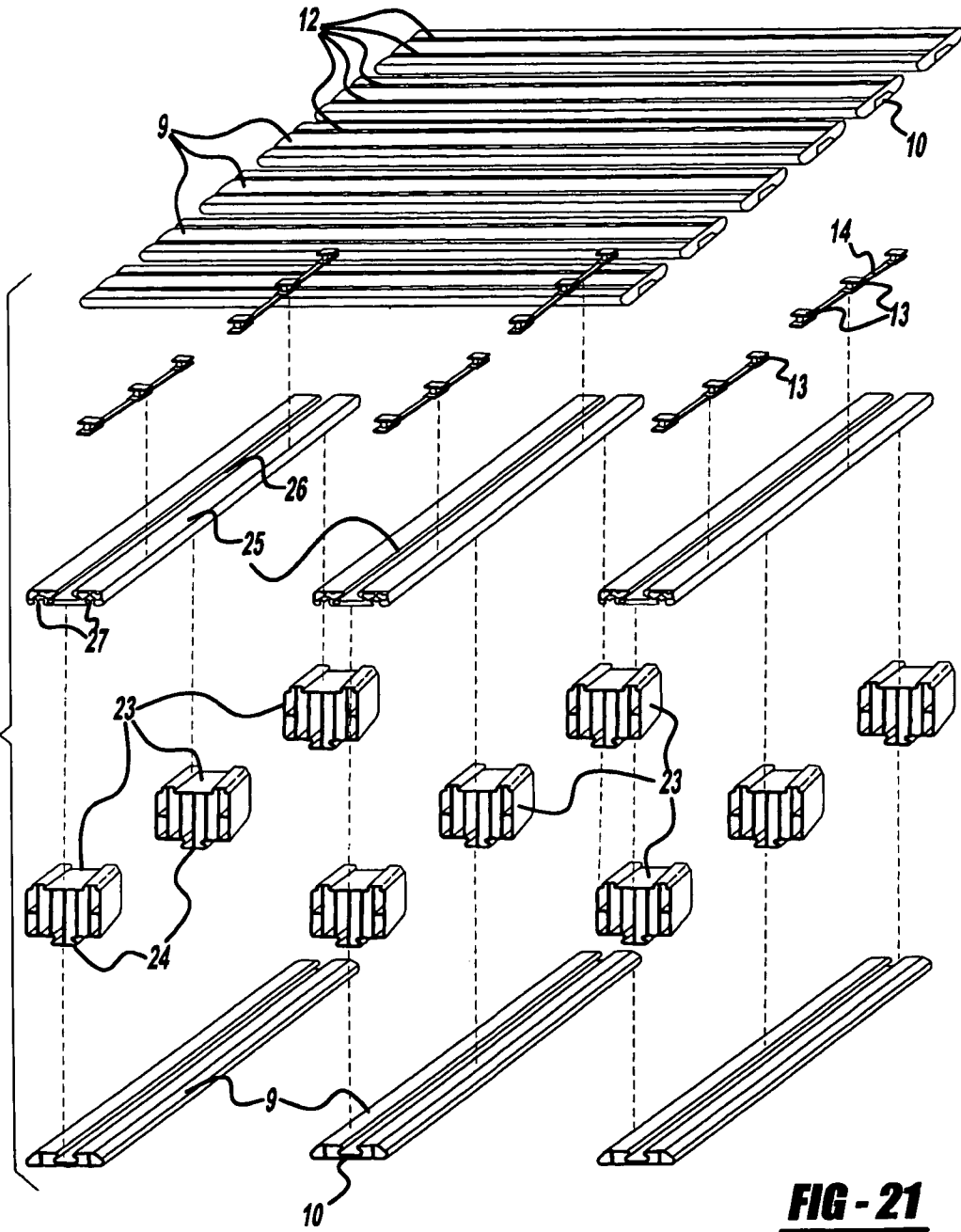
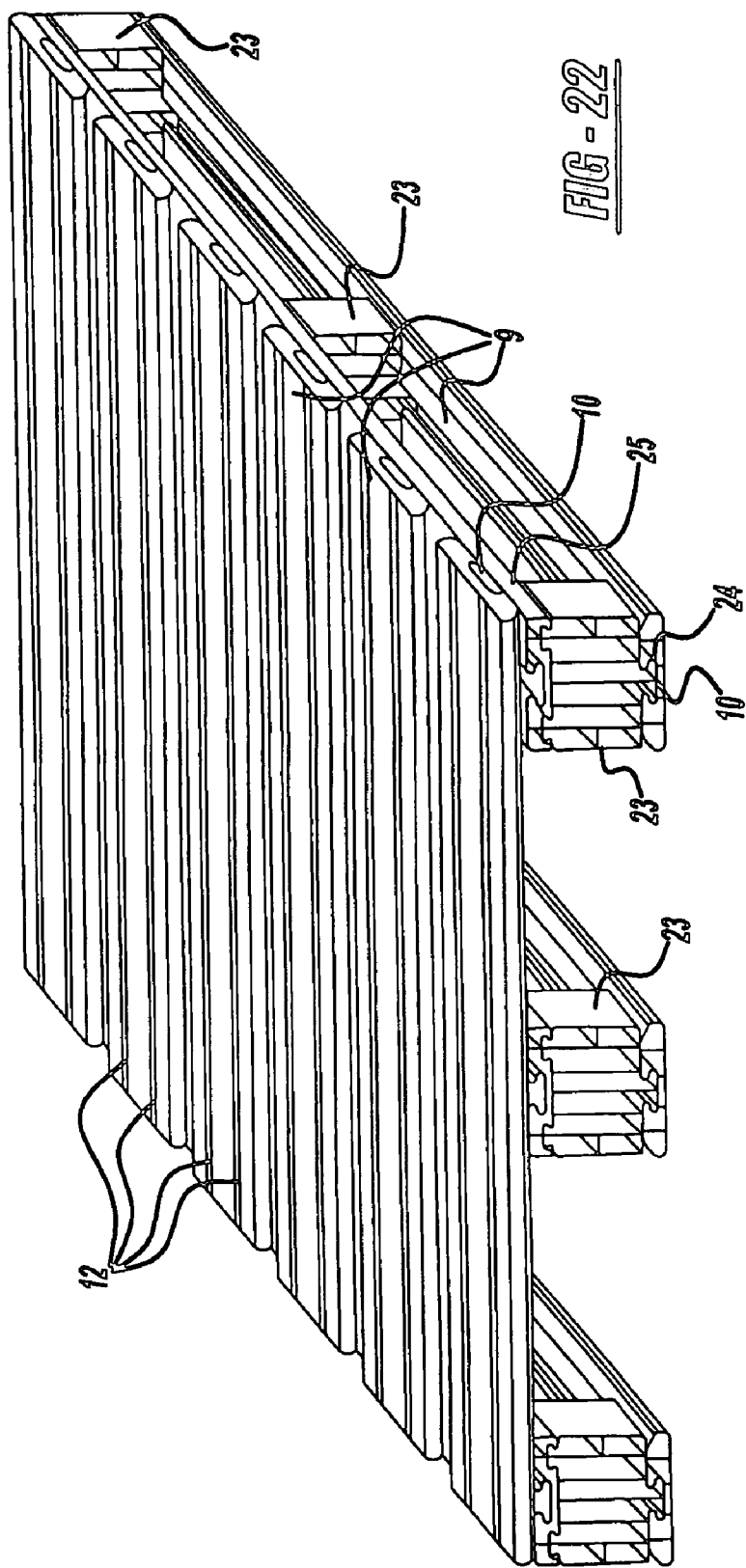


FIG - 21



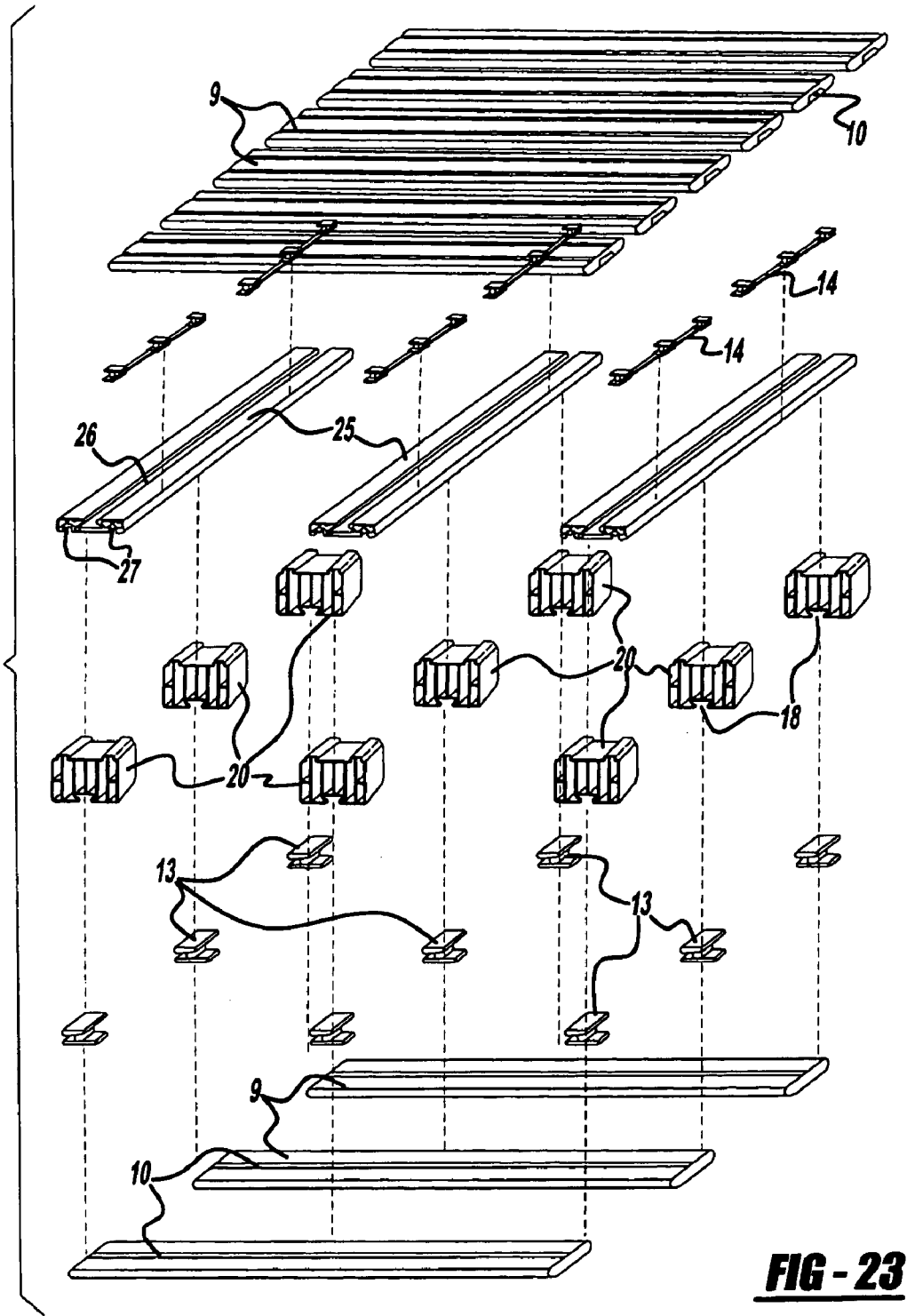


FIG - 23

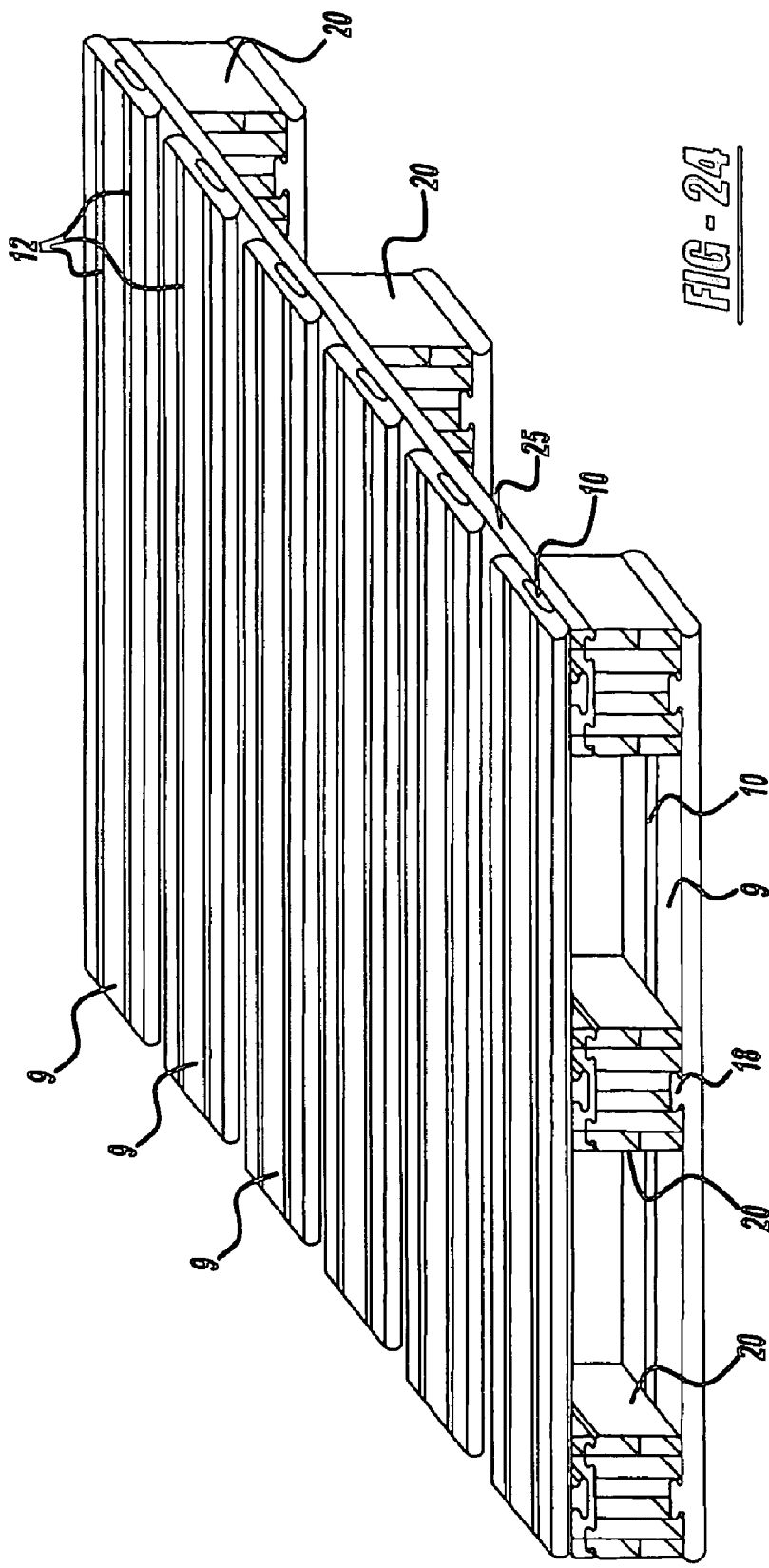


FIG - 24

PREFORMED MODULES TO MANUFACTURE PALLET AND PALLET OBTAINED THEREFROM

FIELD OF THE INVENTION

[0001] The present invention relates to elements to move and manipulate cargoes in general, more particularly it refers to a frame known as pallet, to support packages so that the same can be easily moved by lifting machines, being their essential characteristic that they are obtained from pre-formed modular elements.

BACKGROUND OF THE INVENTION

[0002] Several embodiments of these platforms so popular are taught by the previous art. The traditional platforms are made by means of stringers of hard or mechanically resistant woods, fixed to each other by two layers of wood boards. To make each platform, iron brackets and angles are used to keep the junctions engaged to each other. It is well-known the considerable expense on wood such as quebracho, saligna, eucalyptus, pine, etc. and labor to make these pallets. To minimize the effects of these high costs, used pallets are sometimes reprocessed, replacing the damaged elements, fixing them again in position, which generally is disjointed due to the tough treatment they undergo during operation and transportation to get them out from the field.

[0003] Alternatives with the use of plastic materials have been considered but so far their cost is still high and they were not able to solve all the problems of movement of materials by pallets, because their application is limited to move relatively reduced cargoes.

SUMMARY OF THE INVENTION

[0004] It is a main object of the invention to provide a new type of element, highly simple and economic, that may be used as a support base of cases and shipping containers of different goods, fruit and vegetables cases, etc., so that they can be manipulated by fork lifting machines, to transport them from one place to another, lift them, perform loading and unloading operations, from plantations, transient storage warehouses, refrigerating chambers, or also from and to trucks, ships, warehouses, etc., that is to say all the operations these devices were designed to. It has the outstanding benefit that every module that comprise the invention, can be obtained from preformed elements, made of any of the appropriate materials.

[0005] It is an important object of the invention that the modular arrangement to be described, with its own and known function, is materialized through components manufactured from profiles made of laminar baffle frameworks that besides they made the parts thus obtained lighter, they increase the specific strength required by each component.

[0006] A further object of the invention is that due to the simplicity of the interconnection of the modular elements assembled in accordance with the principles of the invention, the construction of each unit can be performed in a very short time, also the nature of each module allows various construction alternatives according to the application or use of the new supporting frame of the "pallet" type obtained through the special modules of the invention.

[0007] There are other benefits of the invention, such as to obtain a new constructive arrangement highly simple and

economic, that allows to manufacture several different pallets with features to load units out of service or applicable to different characteristics of the massive movement of cases, packaging, boxes, containers of good, construction materials and similar elements, wherein the platforms known as pallets are essential to allow the use of fork lifting machines and handle the cargoes rapidly and easily.

[0008] Double inlet pallets can also be assembled.

[0009] To solve the problems associated with conventional platforms, with said evident benefits as regards quick assembly of the units and variety of pallets that can be obtained with the modular elements that comprise the invention, the applicant has designed a structural configuration of each module extremely simple, easy to implement that is complemented with simple means of interconnection, with a cost much lower than the pallets used at present, which use as usual, crossbars that support a platform comprised by a plurality of boards mounted on the same.

[0010] The term "profile" as used in the description of the modules has its usual technical meaning, to refer to the components as units integrally formed with a given cross section.

[0011] In accordance with one aspect of the invention, preformed modules for making pallets include basic crossbar profiles and additional long and short crossbar profiles, basic and additional board profiles, and connection fittings. Each crossbar profile includes a preformed body having a cross section with a framework of laminar baffles, which define a plurality of cells, a perimetric covering, and longitudinally extending engagement elements. Each of the basic and additional board profiles is laminated and includes a plurality of cells, a perimetric covering, and at least one longitudinal engagement element on the perimetric cover. The crossbar profiles support the board profiles by means of the connection fittings.

[0012] In accordance with another aspect of the invention, a pallet includes at least three basic crossbar profile modules, cover fittings, a plurality of board profile modules, and connection fittings. Each crossbar profile module includes a preformed body having first and second ends, first and second opposing surfaces, and a cross section, wherein the cross section has a framework of laminar baffles that define a plurality of cells, a perimetric covering and longitudinally extending engagement elements for engaging the connection fittings. Each end of the cross profile modules is connected to one of the cover fittings. The board profile modules each have ribbed surface and resilient inserts, and each board profile module is laminated and including a plurality of cells, a perimetric covering, and at least one longitudinal engagement element on the perimetric covering.

[0013] In accordance with a further aspect of the invention, a pallet includes additional short crossbar profile modules, three additional board modules, and a plurality of basic board modules. Each additional short crossbar profile module has upper and lower surfaces, a pair of male engagement elements on its upper surface and a female engagement element on its lower surface. Each additional short crossbar profile module further includes a preformed body having first and second ends, and a cross section. The cross section has a framework of laminar baffles that define a plurality of cells and a perimetric covering. The three additional board

modules are engaged with the upper surfaces the additional short crossbar profile modules. Some of basic board modules are supported by the three additional board modules by means of connection fittings, and the other basic board modules are connected to the lower surfaces of the additional short crossbar profile modules and define two inlets for insertion by the fork of a lifting machine. Each of the basic and additional board profile modules is laminated and includes a plurality of cells and a perimetric covering.

[0014] In order to provide a better understanding of the present invention, so that the same can be easily embodied, the following paragraphs will provide a detailed description of a preferred form of the invention, referring to the attached illustrative drawings, to exemplify but not to limit the invention, which components can be selected among several equivalents without departing from the principles of the invention established in these presents.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is a perspective view of a crossbar profile that comprises one of the basic modules of the invention.

[0016] FIG. 2 shows the crossbar profile with the incorporation of an extension of one its lateral flat faces whereby a pair of longitudinal cover wings are determined.

[0017] FIG. 3 shows the crossbar profile with only one longitudinal cover wing.

[0018] FIG. 4 is a view of the cross section of the crossbar profile according to an alternative of construction of its internal framework.

[0019] FIG. 5 is a perspective view of the module that comprises the board profile that forms the platform.

[0020] FIG. 6 is a perspective view of another embodiment of the cover board profile longitudinally ribbed.

[0021] FIG. 7a) is a cross-sectional view of a board profile with the slotted surface, while FIG. 7b) is the same cross-section wherein inserts made of a resilient material are included.

[0022] FIG. 8 is a perspective view of the connection fittings in two possible positions. They are used to assemble the structure.

[0023] FIG. 9 shows front views of respective end covers for the three embodiments of the crossbar profiles.

[0024] FIG. 10 is a perspective view of the module consisting of the additional crossbar profile to make rackable type pallets, that is to say stackable.

[0025] FIGS. 11 and 12 show alternatives to the front module in embodiments of intermediate and short length.

[0026] FIGS. 13, 14 and 15 are perspective views of the additional crossbar profile, in its three typical dimensions, applied to construct non-rackable pallets, that is to say non-stackable.

[0027] FIG. 16 is a perspective view of a board profile module that will be used with the modules of FIGS. 10 to 15.

[0028] FIG. 17 represents an exploded view of the modular component elements of the invention, conveniently separated, to show the relationship existing among them in the assembly scheme of a pallet using the basic modules.

[0029] FIG. 18 is a perspective view of the finished pallet with the configuration of the previous Figure.

[0030] FIG. 19 is an exploded view of another way to assemble the pallet using basic modules.

[0031] FIG. 20 is a perspective view of the finished pallet, with the configuration of the previous Figure.

[0032] FIG. 21 is an exploded perspective view of the modules of FIGS. 10, 11 and 12 and their connection means disposed to make a double inlet non-stackable (non-rackable) pallet.

[0033] FIG. 22 shows the pallet mounted as a result of the combination and arrangement of the modules of the preceding Figure.

[0034] FIG. 23 corresponds to the assemble scheme of the stackable (rackable) pallet

[0035] FIG. 24 shows the finished pallet according to the scheme of the previous Figure.

[0036] In the preceding figures, the same references denote identical or corresponding parts.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0037] In accordance with FIGS. 1, 2 and 3, the basic crossbar profile module that comprises the invention described in these presents, is comprised by preformed lengthy bodies 1, which cross-section is integrated by integral frameworks of laminar baffles that define adjacent cells 2, the perimetric covering with lateral flat faces 3 and the female longitudinal engagement means 4 and 5 on the upper and lower faces respectively. The profile 1 of FIG. 1, has four rounded longitudinal corners, while profile 1 of FIG. 2 has one of its two lateral flat faces 3 with respective opposite continuing extensions that define the longitudinal wings 6 and 7 also of a cellular structure, and the profile 1 of FIG. 3 has only one longitudinal extension that defines the cover wing 8.

[0038] In FIG. 4, the cells 2 of the crossbar 1 have been split 2a by respective cross baffles, as elements that increase their mechanical strength.

[0039] FIG. 5 shows the cover board profile forming the surfaces of the platform of the pallet, which structure is also cellular with its upper plane 9 flat, and a female longitudinal socket 10 on its lower narrower face, that lies between the sloped planes 11 that elevate to their lateral edges. In FIGS. 6 and 7a) and b) added to the upper plane 9 of the profile, there are two or three ribbed or slotted strips 12 made of the same material or inserts of elastomeric material as well, as those depicted as 12a in FIG. 7b), of a similar configuration, also distributed in two or three longitudinal strips, that prevent displacement of the cargoes.

[0040] In FIG. 8 the assembly fittings are detailed, such as the crosses 13 formed by a pair of laminar plates connected to each other by a core which thickness, as well as the dimensions of the plates, takes into consideration the corresponding dimensions of the said engagement means, where they are operatively housed to effect their interconnection. They are slidably mounted on strips 14 eventually provided with suitable fixing elements.

[0041] FIG. 9 illustrates the three embodiments of the covers 15 applicable, according to each case, to the cross profiles 1, 2 and 3, respectively. It is the same cover plate with wings 8 located in one or two of the corners of the same side, symmetrically replicated, with fixing elements to the ends of the crossbar modules either to the left or right position that correspond.

[0042] FIG. 10 shows the modular element named additional cross profile 16 that has a pair of male longitudinal sockets 17 on its upper face, close to the edges of the profile and one female socket 18 on its lower face. This characteristic make them wider than the basic elements above described and therefore their internal cells multiply to keep the mechanical conditions at an optimal level. FIGS. 11 and 12 show this modular element with different lengths, one intermediate 19 and other shorter 20, that allow to fragment each crossbar originally continue as the element 16 into several sections in order to obtain pallets of double inlet. These modules also ease the construction of stackable or "rackeable" pallets.

[0043] FIGS. 13, 14 and 15 show: the complete module 21, the intermediate 22 and the short module 23 that intervene in non-stackable (non-rackeable) pallets that only differ from the later 16, 19, 20 in that the internal surface of the socket is male 24.

[0044] In relation with the additional board profile module 25 to be used on double inlet pallets, stackable, "rackeable" and non-stackable or non-rackeable, that differ from the basic module in that its upper face has a longitudinal female socket 26, while two identical female sockets are disposed on its flat lower face, 27, close to its sides.

Operation

[0045] Once stated the different components of the embodiment of the invention, described to explain the nature thereof, the description will be now complemented with the functional and operative relationship of its parts and the result they attain.

[0046] The manufacture of each of the supporting units which are the object of the invention, starts from the execution of the respective assembly scheme.

[0047] Thus for conventional pallets, the basic profile modules, the cross module 1,2,3 located according to its characteristics, generally three of them, and the board module 5,6 to cover the platform, are used, which are selected to obtain a flat or ribbed surface, and connected by using the connection fittings and the front and distal covers on the ends of the corresponding crossbars, as shown in FIGS. 17 and 19, sufficiently illustrative by themselves, and by their interconnection the pallets shown in FIGS. 18 and 20 are obtained. It is to be understood that in the stackable pallet of FIGS. 22 and 24 the cross profiles are connected to each other sandwiching as reinforces means board profiles.

[0048] The schematic figures, designated 21 and 22, detail the constructive arrangement of a non-stackable or non-rackeable double inlet pallet.

[0049] The schematic FIGS. 23 and 24 illustrate the arrangement wherein the modules are facing to each other to assemble a double inlet stackable or also rackeable pallet.

[0050] Thus one of the possible embodiments of the invention has been described, and the way the same operates, comprising also its specific applicability as the conventional pallets in use. This document is complemented with the abstract of the invention contained in the accompanied claims.

What is claimed is:

1. Preformed modules for making pallets including support crossbars and a platform including a plurality of boards mounted on the crossbars, the cross bars being spaced apart to allow the introduction of the fork of a lifting machine, the performed modules comprising:

basic crossbar profiles and additional long and short crossbar profiles, each crossbar profile including a preformed body having a cross section with a framework of laminar baffles that define a plurality of cells, a perimetric covering and longitudinally extending engagement elements;

basic and additional board profiles, each board profile being laminated and including a plurality of cells, a perimetric covering, and at least one longitudinal engagement element on the perimetric covering; and

connection fittings, wherein the crossbar profiles support the board profiles by means of the fittings.

2. Modules according to claim 1, wherein each basic crossbar profile module continuously extends a length of the pallet and has a continuous longitudinal wing on at least one of its side faces, the wing and the side face forming a side cover of the pallet, a height of the wing being at least equal to a thickness of the board profiles.

3. Modules according to claim 2, wherein each additional long crossbar module has longitudinal wings on one of its side faces, a height of each wing is about equal to a thickness of the board profile modules.

4. Modules according to claim 1 wherein the short additional crossbar profile modules includes the supports for the board profiles and are connected to each other by one additional board profile.

5. Modules according to claim 1, wherein the additional board module is sandwiched between additional short crossbar modules and the basic board profile modules.

6. Modules according to claim 1, wherein each additional board module has a longitudinal central female engagement groove on one of its faces, while an opposite face has a pair of female longitudinal grooves close to its lateral sides.

7. Modules according to claim 1, wherein each of the additional short and long crossbar module has on one of its faces a pair of longitudinal male engagement elements close to the edges of the face's sides, while the opposite face has only one female engagement element along its longitudinal axis.

8. Modules according to claim 1, wherein each of the additional short and long profile modules has on one of its faces a pair of male longitudinal engagement elements close to the edges of the face's sides, while the opposite face has only one male engagement element along its longitudinal axis.

9. Modules according to claim 1, wherein each basic board profile module has lower and upper surfaces, the lower surface having sloped planes at its respective lateral

sides and a longitudinal female engagement element positioned between the sloped planes, the upper surface having longitudinal ribs.

10. Modules according to claim 1, wherein each connection fitting includes a pair of quadrangular plates connected by a core, the plates are adapted to engage the engagement elements.

11. Modules according to claim 1, wherein the engagement elements on the covering of each module are functionally related.

12. Modules according to claim 1, wherein the connection fittings are slidably engaged with the engagement elements.

13. Modules according to claim further including cover fittings, wherein each end of the cross profile modules is connected to one of the cover fittings, and the cover fittings are configured according to the cross sections of the crossbar profile modules.

14. A pallet comprising:

at least three basic crossbar profile modules, each crossbar profile module including a preformed body having first and second ends, first and second opposing surfaces, and a cross section, the cross section having a framework of laminar baffles that define a plurality of cells, a perimetric covering and longitudinally extending engagement elements;

cover fittings, each end of the cross profile modules being connected to one of the cover fittings;

a plurality of board profile modules having ribbed surface and resilient inserts, each board profile module being laminated and including a plurality of cells, a perimetric covering, and at least one longitudinal engagement element on the perimetric covering; and

connection fittings for engaging the engagement elements.

15. A pallet according to claim 14, wherein the board profile modules are mounted on the first and second surfaces of the crossbar profile modules by means of the connection fittings.

16. A pallet comprising:

additional short crossbar profile modules, each additional short crossbar profile module having upper and lower surfaces and a pair of male engagement elements on its upper surface and a female engagement element on its lower surface, each additional short crossbar profile module further including a preformed body having first and second ends, and a cross section, the cross section having a framework of laminar baffles that define a plurality of cells and a perimetric covering;

three additional board modules engaged with the upper surfaces the additional short crossbar profile modules; and

a plurality of basic board modules, some of basic board modules being supported by the three additional board modules by means of connection fittings, and the other basic board modules being connected to the lower surfaces of the additional short crossbar profile modules and defining two inlets for insertion by a fork of a lifting machine, wherein each of the basic and additional board profile modules is laminated and includes a plurality of cells and a perimetric covering.

17. A pallet according to claim 16, wherein the other basic board modules are directly engaged with the lower surfaces of the additional short crossbar profile modules, and the other basic board modules are arranged in parallel with the additional short crossbar profile modules.

18. A pallet according to claim 16, wherein the other basic board modules are engaged with the lower surfaces of the additional short crossbar profile modules by means of connection fittings, and the other basic board modules are arranged perpendicularly with the additional short crossbar profile modules.

19. A pallet according to claim 16, wherein the short additional crossbar modules are distributed in groups of at least three units axially spaced apart from each other.

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