(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
28 April 2005 (28.04.2005)

PCT

(10) International Publication Number
WO 2005/037667 A1

(51) International Patent Classification[7]: B65D 19/28

(21) International Application Number:
PCT/AU2004/001397

(22) International Filing Date: 13 October 2004 (13.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2003905661 15 October 2003 (15.10.2003) AU

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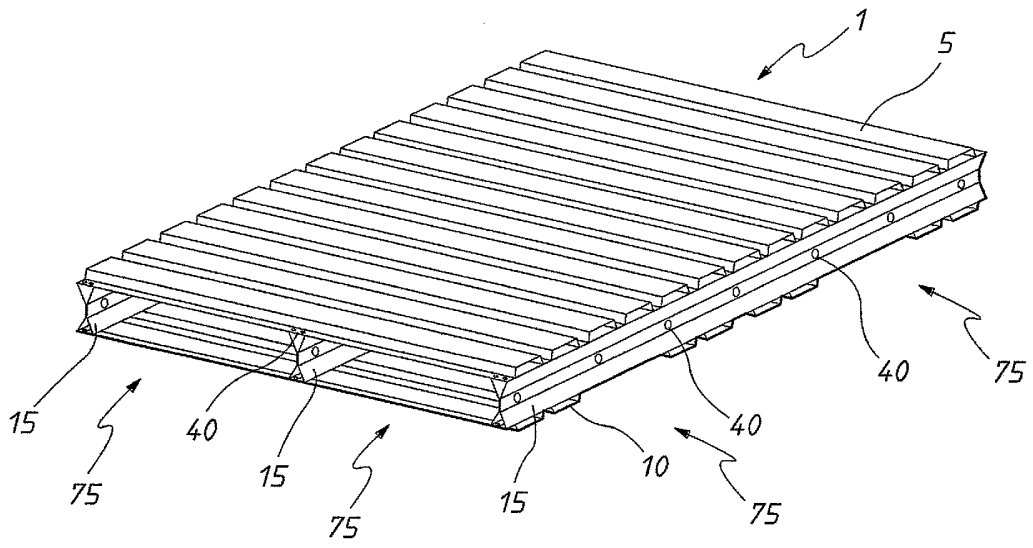
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A PALLET



(57) Abstract: A metal pallet (1) having: a top deck (5), a bottom deck (10) and at least two elongate bearers (15) securing the decks (5, 10) together. Each bearer (15) having a first portion (16) and a second portion (17), each portion (16, 17) extends separately between the decks (5, 10) and has a top web (20) and a bottom web (25) connected to a central web (30) by inclined portions (35).

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A PALLET

Field of the Invention

The present invention relates to pallets and in particular to a multi-purpose pallet having detachable components.

Background of the Invention

Pallets made of wood are typically used throughout the world for easy storing and transporting of goods. These pallets are generally of a square shape having an upper and lower deck made of a series of wooden planks and at least two solid wooden beams therebetween. The pallet is normally nailed together and includes slots within which a forklift's tines or other material handling devices can be located for lifting and moving the pallet.

Known pallets suffer from many disadvantages. For example; they are expensive to manufacture; require repeated repair; are limited to standard sizes; have protruding fixings or connections; are limited in the amount they can carry; are easy to damage or break; are heavy; difficult to attach additional components when required; absorb moisture, liquids and odours; are a fire risk; can have termite and insect contamination; splinter easily; the nails can loosen; have a short life span and the timber used is generally from hardwood forests. Of particular concern is that wood pallets damaged easily and the repair or replacement of the pallet is expensive, time consuming and it is usually easier to just discard the pallet. Further, wood pallets retain dirt and other undesirable substances which minimises their use in contamination or hygienic areas such as the food or medical industries.

Metal and plastic pallets have also been developed. These types of pallets have many disadvantages similar to wood pallets.

Accordingly, there is a need for a lightweight metal pallet that has releasably connectable parts for easy maintenance and repair, overcomes debris and contamination problems and includes no sharp edges.

Object of the Invention

It is an object of the present invention to overcome or ameliorate some of the disadvantages of the prior art, or at least to provide a useful alternative.

Summary of the Invention

There is firstly disclosed herein a metal pallet having:

a top deck;

a bottom deck; and

at least two elongate bearers securing said decks together;

each bearer having a first portion and second portion, each portion extends separately between said decks and has a top web and a bottom web connected to a central web by inclined portions.

Preferably, said central webs of said first and second portions are releasably securable together.

Preferably, said central webs are substantially normal to said decks.

Preferably, said top and bottom webs are releasably securable to said decks.

Preferably, said webs are releasably securable to said decks and/or each other by fastening means.

Preferably, said fastening means are threaded fasteners.

Preferably, said pallet includes a plurality of holes for receiving each said fastening means.

Preferably, said fastening means are welds or rivets.

Preferably, said pallet is of a generally rectangular configuration having a front edge, a rear edge and two side edges.

Preferably, at least one edge includes a cover plate.

Preferably, at least one elongate bearer includes a stiffener.

Preferably, at least one bearer includes an end cap.

Preferably, said top and/or bottom deck is of a profiled configuration.

Preferably, said profiled configuration are corrugations.

Preferably, said pallet includes sheet material secured to at least one said deck.

Preferably, said pallet includes cavities for receipt of tines of a forklift or other handling equipment.

Preferably, said cavities are located on all sides of said pallet.

Brief Description of the Drawings

A preferred form of the present invention will now be described, by way of example only, with reference to the accompanying drawings wherein:

Figure 1 is a partial perspective view of a bearer for a pallet of an embodiment of the present invention;

Figure 2 is a perspective view of a pallet of an embodiment of the present invention;

Figure 3 is a partial perspective view of the pallet of Figure 2 with attachments;

Figure 4 is a partial side view of the pallet of Figure 2 with attachments.

Figures 5a to 5d are cross-sectional views of bearer embodiments for a pallet of the present invention;

Figures 6a to 6c are partial side views of embodiments of the invention showing recesses for tines of a forklift;

Figures 7a and 7b are perspective views showing the four way openings of Figs. 6a to 6c; and

Figure 8 shows a cross-sectional view of an alternate embodiment of the pallet of Fig. 1.

Detailed Description of the Preferred Embodiments

There is disclosed herein a pallet 1 manufactured of metal typically galvanised steel or aluminium. The pallet 1 includes a top deck 5, a bottom deck 10 and at least two elongate bearers 15 securing the decks 5, 10 together. As best seen in Figures 1, 5a to 5d and 8 each bearer 15 has a first portion 16 and a second portion 17 extending separately between the decks 5, 10 and having a top web 20 and a bottom web 25 connected to a central web 30 by inclined portions 35. In use, the webs 20, 25, 30 of the first and second portions 16, 17 are releasably securable to each other and the decks 5, 10 by fastening means 40 such as a threaded fastener which is typically located in holes 45. In the preferred form the central webs 30 are substantially vertical or normal to the decks 5, 10. Alternatively, the fastening means 40 could be a weld or rivet, the pallet 1 easily being repaired by drilling out the weld or rivet, replacing the part and re-welding or riveting.

Typically, the portions 16, 17 of the bearers 15 are positioned abutting each other and fastening means 40 in the form of a threaded fastener, spot welds, blind rivet or the like secure the two central webs 30 together. The pallet 1 can also include a counter-sunk bore or aperture in the holes 45 for hiding the fastening means 40 below the plane of the adjacent surfaces. This will ensure no sharp objects, such as the end of a bolt, protrude above the adjacent surface of the deck 5, 10. As best seen in Figure 3, the elongate bearer 15 can also include a stiffener strip 50 to provide further support to the bearer 15 when the pallet 1 is required for heavy loads. The stiffener strip 50 is merely attached along the

central web 30 at the holes 45 for the fastening means 40. The pallet 1 can also include many additional components to provide a more profiled pallet 1. For example, the top or bottom decks 5, 10 can include profiled configurations such as corrugations as best seen in Figures 2 and 7a, 7b. Cover plates and end caps 55 or the like as seen in Figures 3 and 4 could also be utilised.

Referring specifically to Figures 1, 5a to 5c and 8, the top and bottom webs 20, 25 are load support flanges providing an opening 47 therebetween allowing access for spot welding or attaching threaded fasteners such as screws or bolts or the like. The separator of the portions 16, 17 also allows for only one side of the bearer 15 to be replaced if required. In a preferred form, the webs 20, 25 are abutting. A rounded non-sharp edge is preferably provided between the webs 20, 25 and inclined portions 35. The overall dimensions of all components can change depending upon the required pallet 1.

In Figure 2 a standard 1000 x 1200 cm pallet 1 is shown. The pallet 1 dimensions can vary to suit particular industry requirements such as, 1165 x 1165 cm, for example. The decks 5, 10 can be in varying configurations, such as corrugations, flat panels, curves or the like. The corrugations for example, can be in any direction, non-uniform, and/or a combination of directions or shapes depending on the load to be lifted and moved. In the embodiment shown, galvanised steel corrugations are shown providing superior strength and durability. The corrugations also provide maximum surface contact while retaining structural adequacy. However, a 100% flat surface 79 can be provided in place of the corrugations or affixed to the top of the corrugations (see Figure 4) or a combination of surfaces can be provided.

The advantages of the pallet 1 as shown herein is that all components can be disassembled and reassembled or damaged components easily replaced, if required. Shaped sleeves 60 (as best seen in Figure 4) made of any material could also be added to cover edges and increase strength. End caps 55 could also be added to provide a more aesthetically looking pallet 1, provide impact resistance, cover apertures and edges at the ends of the bearers 15. If corrugations are used an edge strip 65 could also be provided to seal in any openings for hygiene requirements. There is also shown in Figures 2, 6a to 6c, 7a and 7b, openings 75 for the tines or wheels of forklifts and pallet trucks. The pallet 1 could also include a cross member (not shown) between the bearers 15 or inside the corrugations to provide additional support for very heavy loads.

Figure 4 also shows additional componentary including a lip 77 formed in the corrugations to ensure no sharp edges and to stiffen against impact from a forklift. A separate U-shaped cover 60 could also be provided as mentioned above. The lip 77 also

provides an increase in the horizontal strength of the pallet 1. This embodiment also shows a further sheet material 79 across the top of the corrugations and a stiffener strip 50. The sheet material 79 could be galvanised steel, timber, plastic or any other material, if required.

Figures 5a to 5d and 8 show different embodiments of the bearer 15. These embodiments are utilised for different fastener combinations allowing easy access to the bearer 15. As seen in Figures 5a and 5b additional members 80 can be included to receive the decks 5, 10.

Figures 6a to 6c, 7a and 7b show further embodiments of the invention, detailing openings 75 in the pallet 1 for allowing four way entry for a lifting device.

Figure 8, shows a further embodiment of the invention having fastening means 40 in the form of a screw and rivet. The webs 20 and 25 are turned inward to reduce sharp edges.

The pallet 1 disclosed herein can be completely disassembled as all components can be replaced individually quickly and inexpensively. Pallet 1 has extremely strong load bearing capacity due to the angles of the members making up the portions 16, 17; has structural adequacy and load distribution for rotational movements; the shape can be altered in all dimensions and angles for various purposes; smooth non sharp surfaces on each bearer 15 horizontal side surfaces; small cross sectional area of end maximises width of openings 75 for fork lift tines; allows for bolted, riveted, screwed or welded fixings 40 for joins and decks 5, 10 to bearers 15; holes or apertures 45 are recessed allowing for non protruding fixings/connections; external side has no visible joins, resists dirt collection; interior space is minimised to reduce contamination area; interior space small to enhance any cleaning pressure hose effect; the bearers 15 could be galvanised steel or aluminium.

The deck 5, 10 and the additional sheet material layer 79 could be steel, timber, plastic, paperboard, composites or fibres. The steel bearers 15 for example could support timber decking and be secured by a threaded nail, bolt or the like. The bearer 15 shape allows for mid height horizontal stiffener 50 attachment for extra heavy loads; bearer shape can be segmented to allow for 4 way pallet option; deck 5, 10 can be adapted to 100% coverage if pallet 1 purpose requires; one or more additional decks 5, 10 could be added; allows hygienic adaptability for food industry requirements; deck board profile can have edge returns 77 roll formed to avoid sharp edges; deck board edge return 60 to stiffen end against fork lift and pallet truck impact; bearer 15 shape allows for timber deck boards if necessary; deck board shape can have steel strip attached to cover cavities;

deck board profile can have 45-60 degree folded ends to eliminate sharp edges; and alternatively deck boards can have horizontal angle cover attachment.

Although the invention has been described with reference to specific examples, it will be appreciated by those skilled in the art that the invention may be embodied in many other forms and other structures.

CLAIMS

1. A metal pallet having:

a top deck;

a bottom deck; and

at least two elongate bearers securing said decks together;

each bearer having a first portion and second portion, each portion extends separately between said decks and has a top web and a bottom web connected to a central web by inclined portions.

2. The pallet according to claim 1, wherein said central webs of said first and second portions are releasably securable together.

3. The pallet according to claim 1 or 2, wherein said central webs are substantially normal to said decks.

4. The pallet according to any one of claims 1 to 3, wherein said top and bottom webs are releasably securable to said decks.

5. The pallet according to any one of the preceding claims, wherein said webs are releasably securable to said decks and/or each other by fastening means.

6. The pallet according to claim 5, wherein said fastening means are threaded fasteners.

7. The pallet according to claim 5 or 6, wherein said pallet includes a plurality of holes for receiving each said fastening means.

8. The pallet according to claim 5, wherein said fastening means are welds or rivets.

9. The pallet according to any one of the preceding claims, wherein said pallet is of a generally rectangular configuration having a front edge, a rear edge and two side edges.

10. The pallet according to claim 9, wherein at least one edge includes a cover plate.

11. The pallet according to any one of the preceding claims, wherein at least one elongate bearer includes a stiffener.

12. The pallet according to any one of the preceding claims, wherein at least one bearer includes an end cap.

13. The pallet according to any one of the preceding claims, wherein said top and/or bottom deck is of a profiled configuration.

14. The pallet according to claim 13, wherein said profiled configuration are corrugations.

15. The pallet according to any one of the preceding claims, wherein said pallet includes sheet material secured to at least one said deck

16. The pallet according to any one of the preceding claims, wherein said pallet includes cavities for receipt of tines of a forklift or other handling equipment.

17. The pallet according to claim 16, wherein said cavities are located on all sides of said pallet.

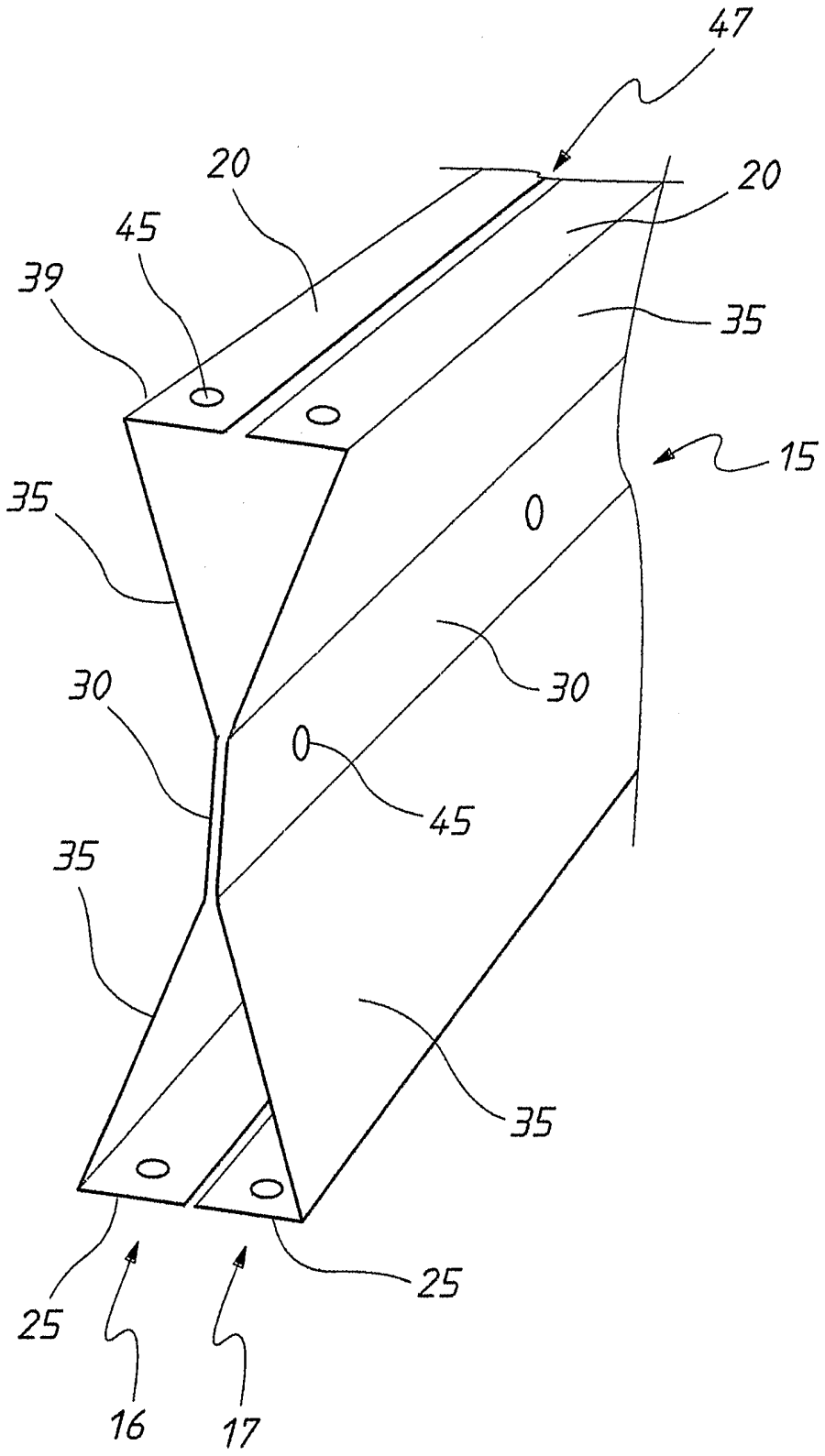


FIG. 1

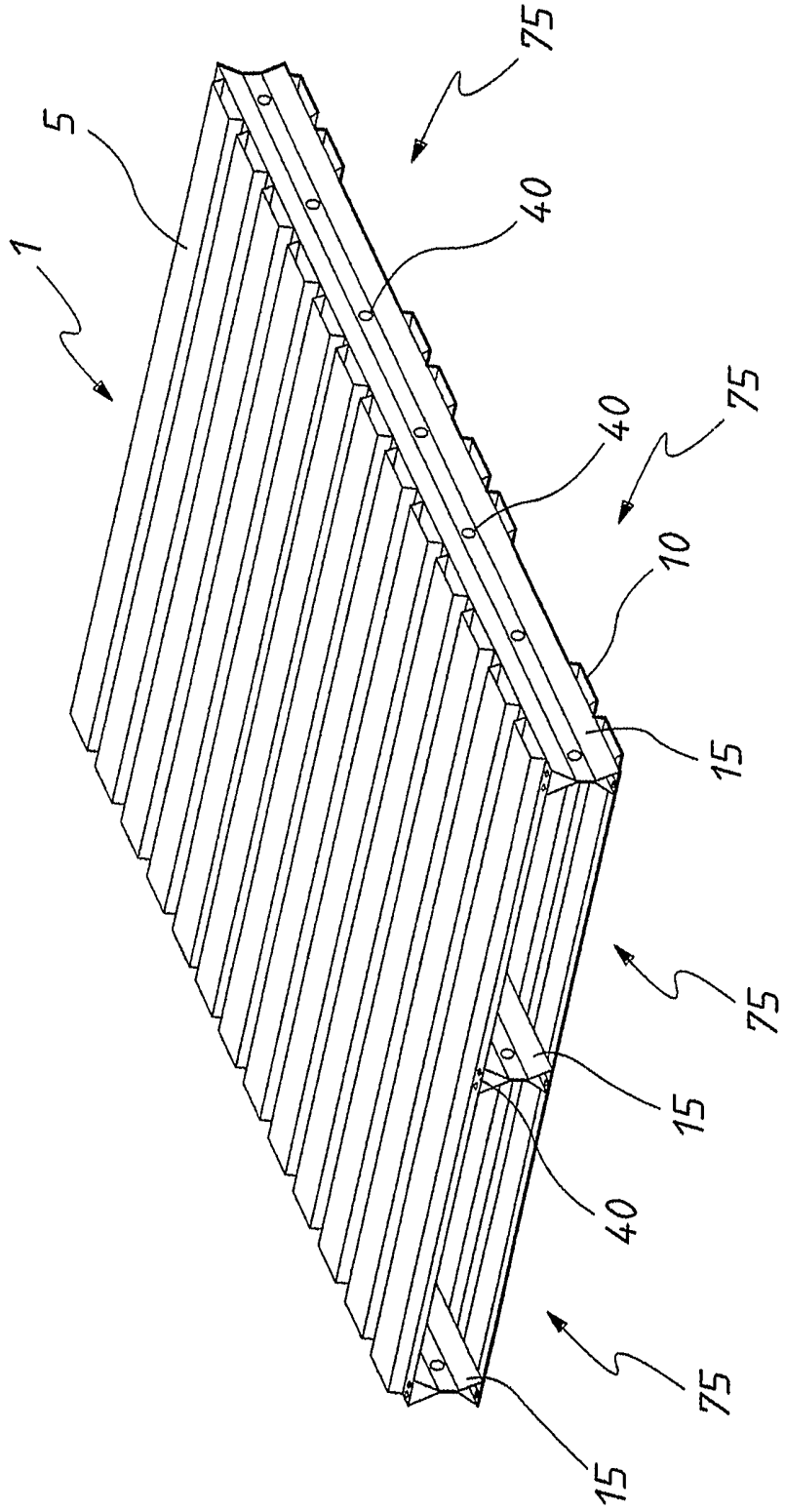


FIG.2

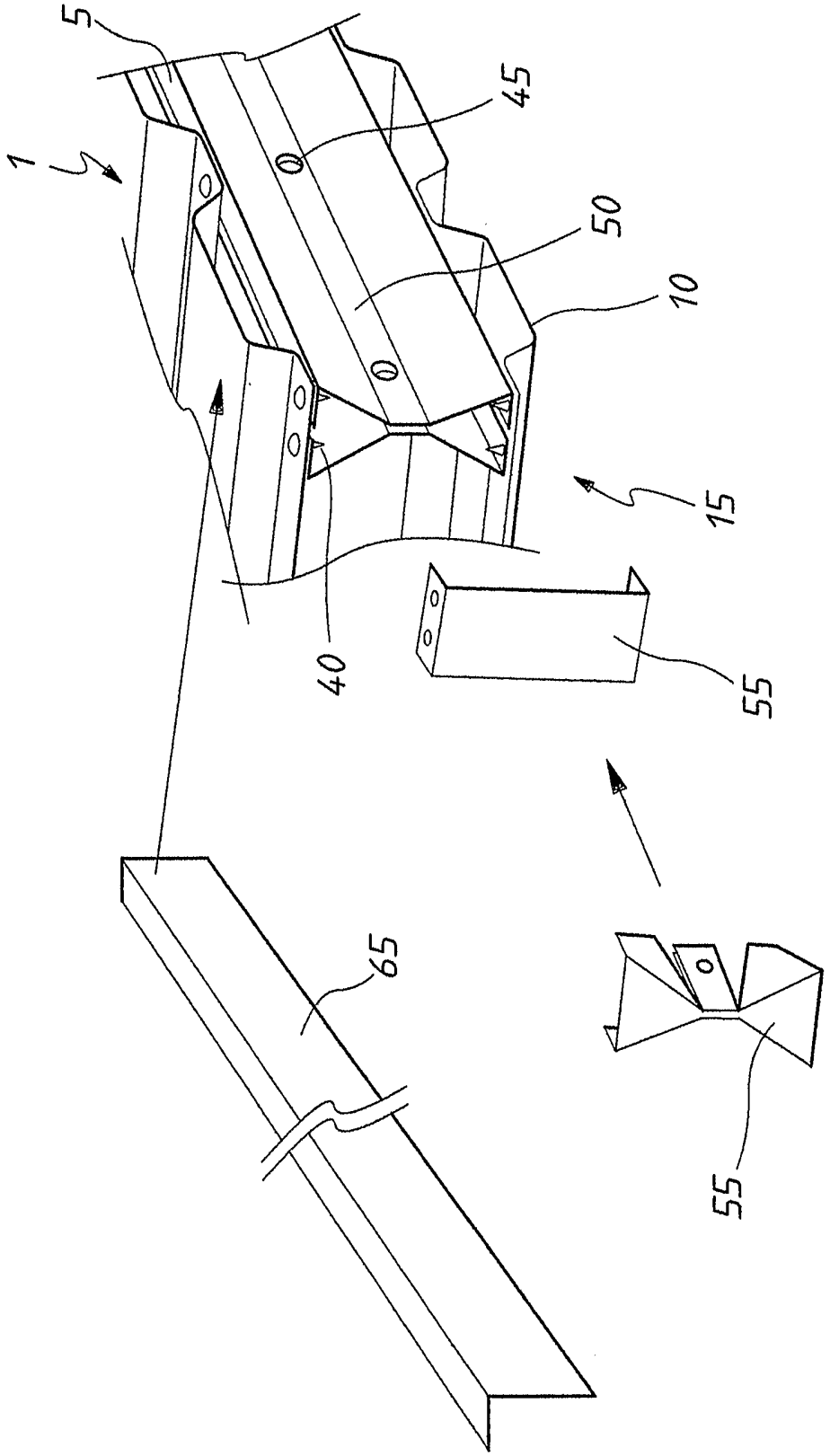


FIG.3

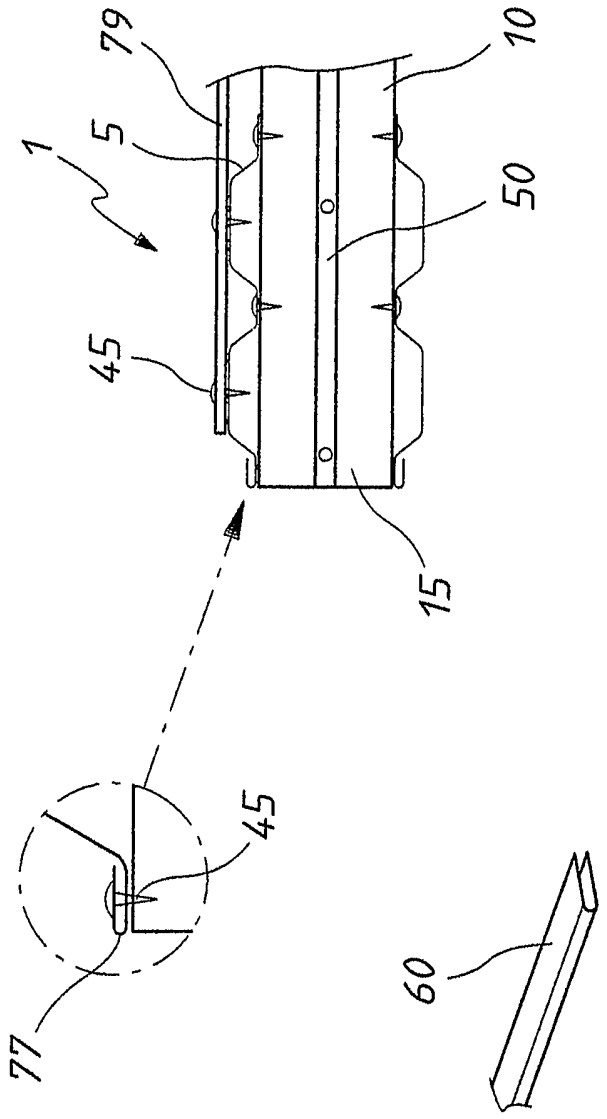


FIG.4

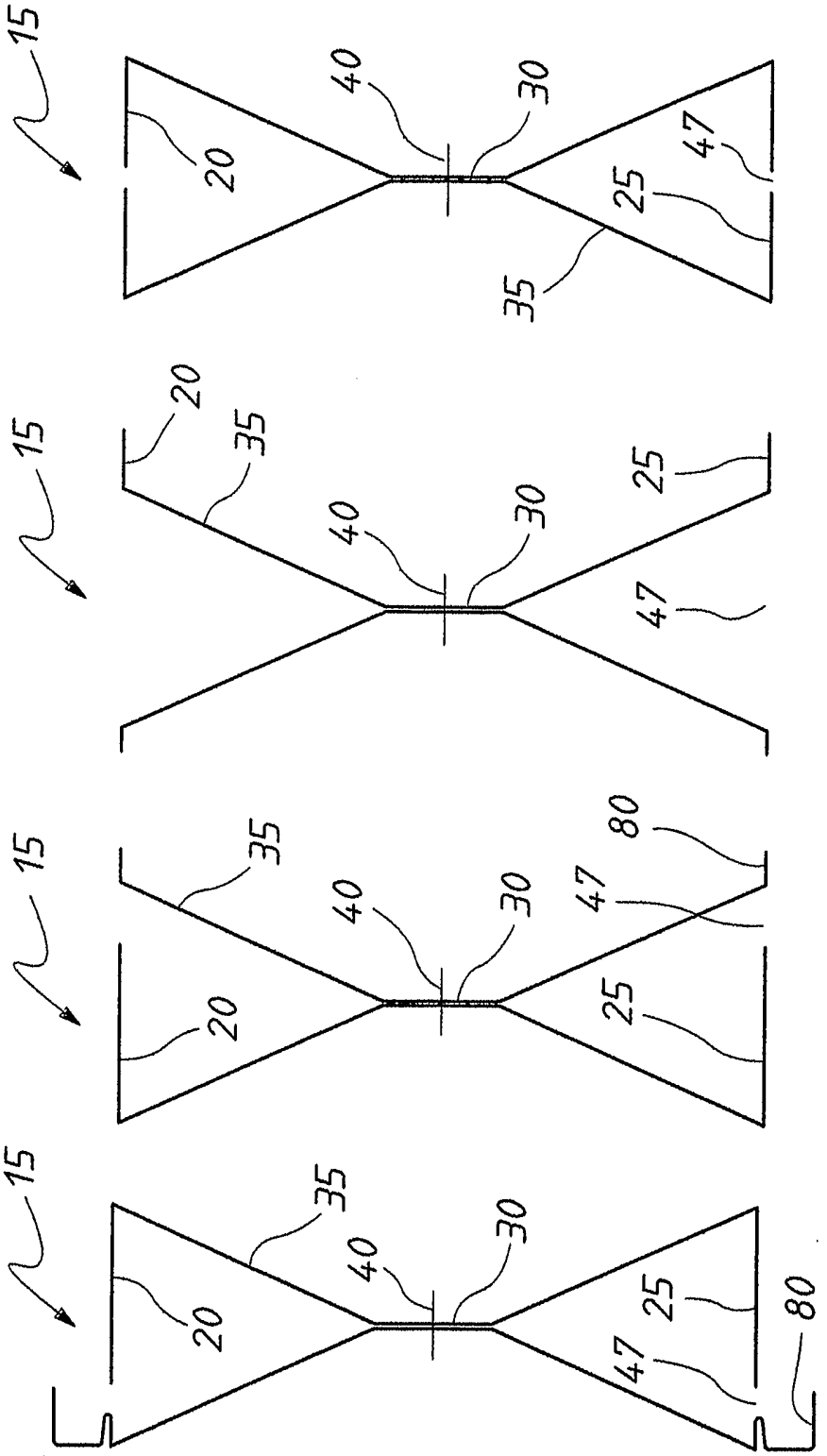


FIG.5a

FIG.5b

FIG.5c

FIG.5d

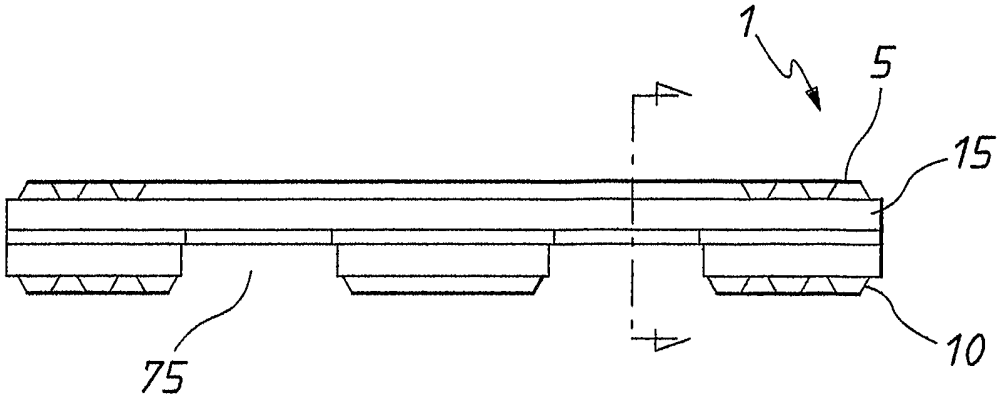


FIG.6a

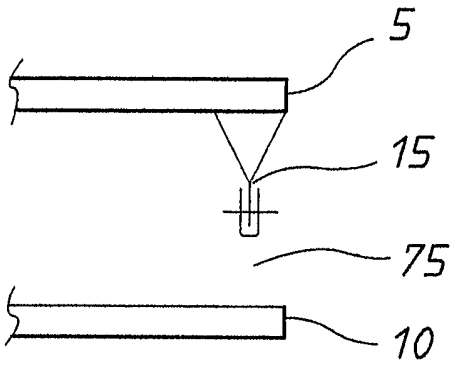


FIG.6b

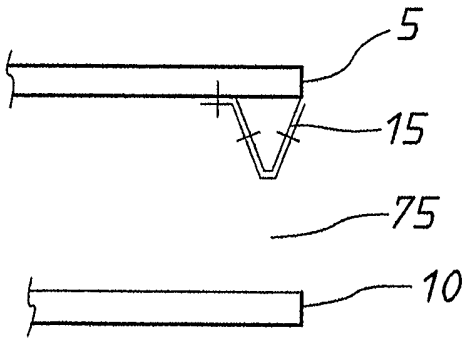


FIG.6c

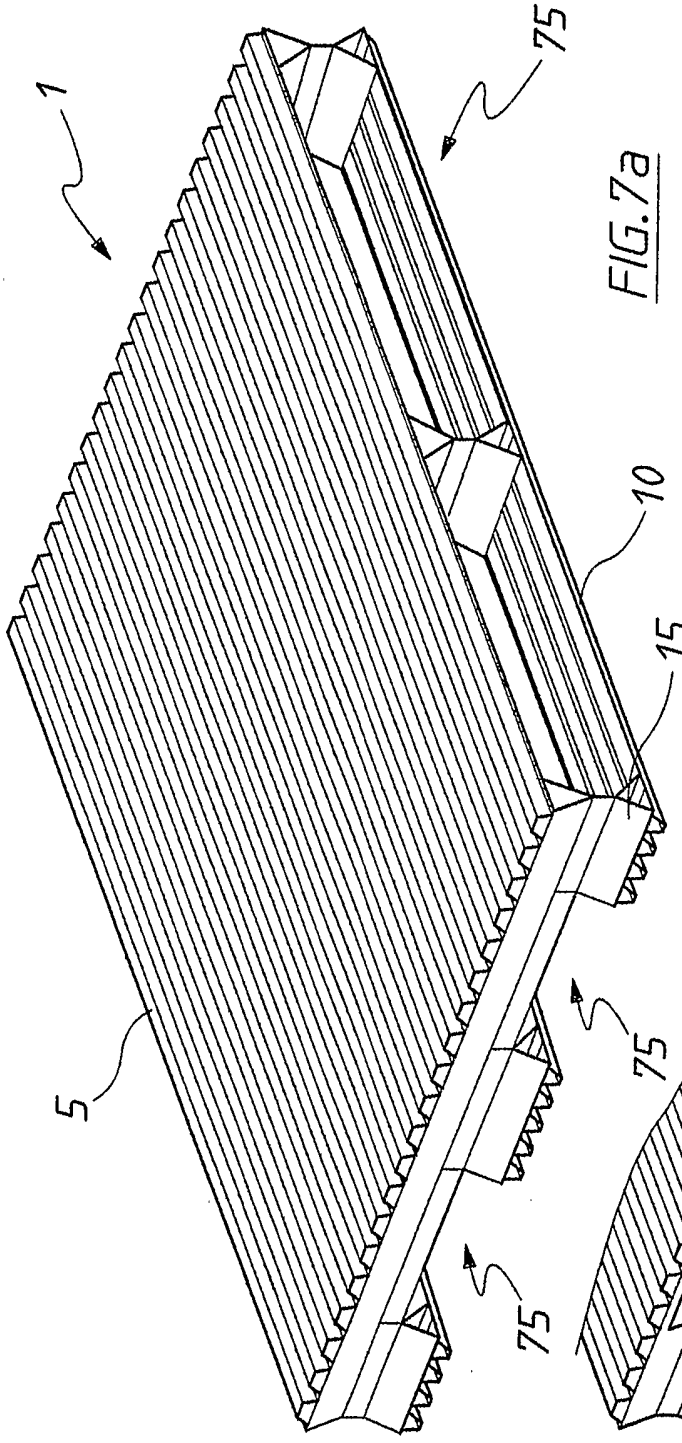


FIG.7a

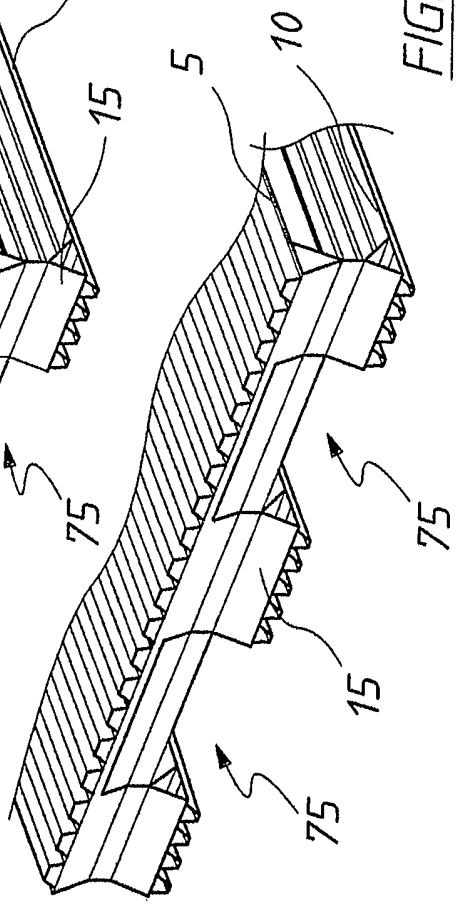


FIG.7b

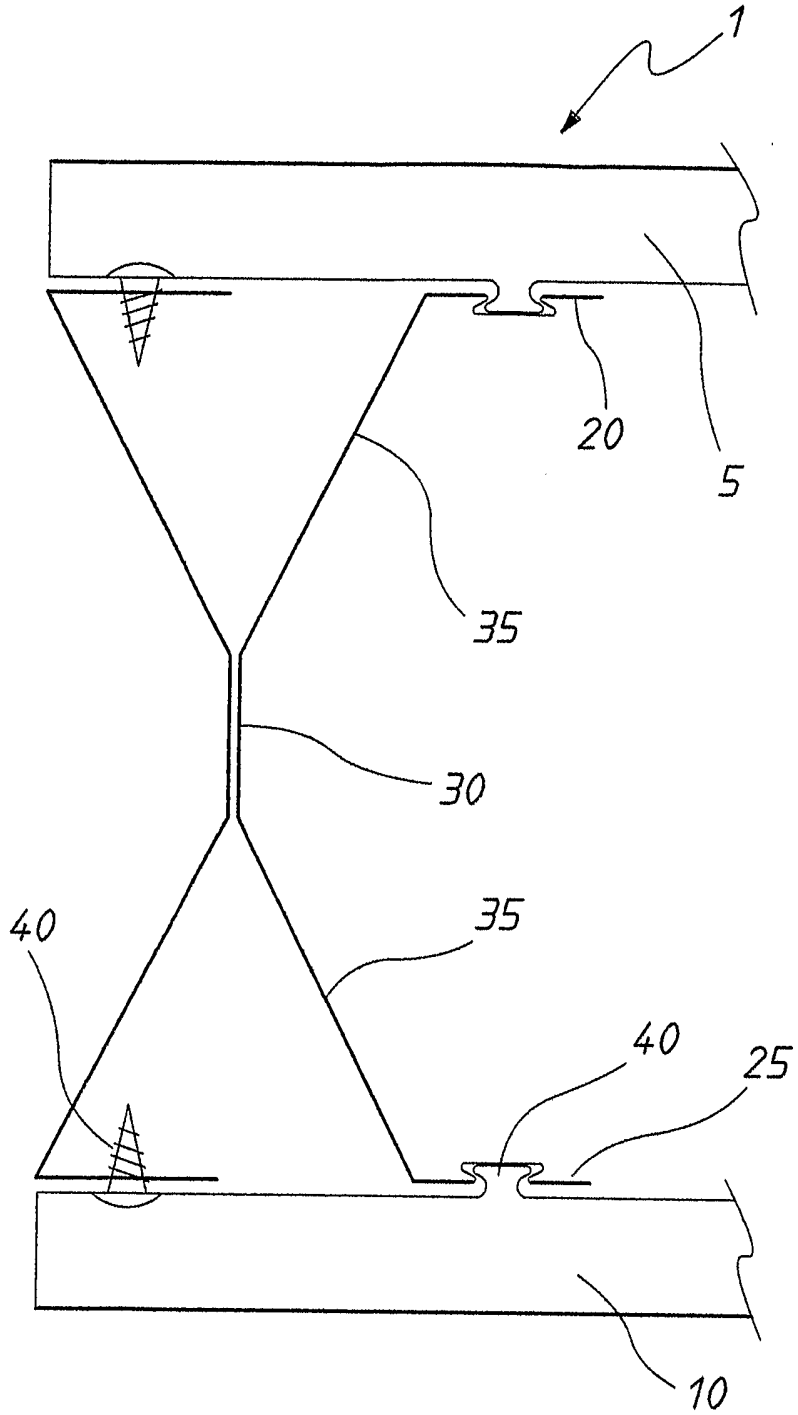


FIG.8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2004/001397

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. [7]: B65D 19/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU : IPC B65D 19/08, 19/28

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
DWPI: IPC B65D 19/- and keywords (pallet, metal, bearer, stringer, deck, web) and similar terms
USPTO, ESP@CE and keywords: pallet, metal, web, bearer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 1986/000866 A1 (DASH) 13 February 1986 See figures	
A	AU 136109 (10693/47) B (FORKTRUCKS PALLETS LIMITED) 17 April 1947 See figures 2 and 3	

☐ Further documents are listed in the continuation of Box C ☒ See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 November 2004	16 NOV 2004
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer **A. ALI** Telephone No : (02) 6283 2607

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/AU2004/001397

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
AU	10693/47	GB	609769				
WO	1986000866	AU	46094/85	DK	114986	EP	0187834
		FI	861016	NO	860951		

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

END OF ANNEX