



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 547 931 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.06.2005 Bulletin 2005/26

(51) Int Cl.7: **B65D 19/44**

(21) Application number: **04027927.5**

(22) Date of filing: **24.11.2004**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL HR LT LV MK YU

(72) Inventor: **Okamuro, Toshihiko**
Utsunomiya-shi Tochigi 320-0017 (JP)

(74) Representative: **Grünecker, Kinkeldey,
Stockmair & Schwanhäusser Anwaltssozietät
Maximilianstrasse 58
80538 München (DE)**

(30) Priority: **24.12.2003 JP 2003426704**

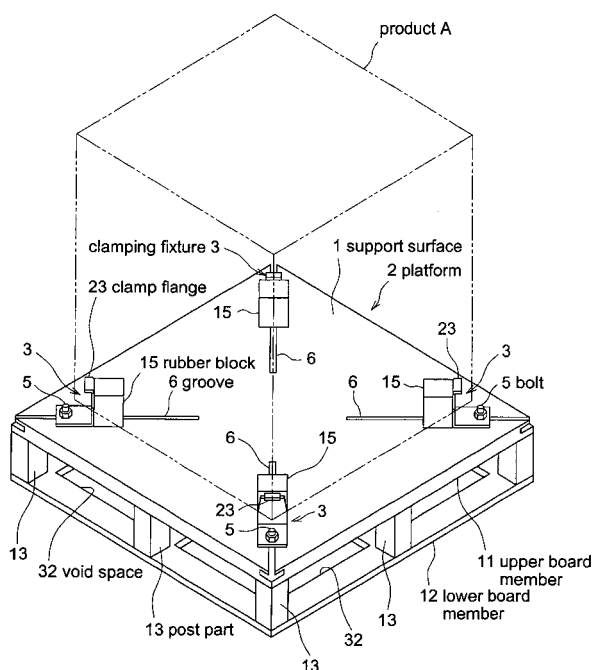
(71) Applicant: **MATSUSHITA ELECTRIC INDUSTRIAL
CO., LTD.**
Kadoma-shi, Osaka 571-8501 (JP)

(54) Carrier apparatus

(57) A carrier apparatus is provided to ship or store products of various sizes and shapes. The carrier apparatus comprises a platform (2). Grooves (6) are formed on the platform on which a product (A) is placed, and fixing members (3) are placed within the grooves to allow the fixing members to be moved to various positions on a support surface (1) of the platform. Moreover, space is provided between the upper board (11) and

lower board (12) of the platform to insert a fork part of a freight handling vehicle. Bumpers (15) are inserted between the upper side of upper board member and the lower surface of the product placed on the support surface. The support surface on the upper side of the board member is formed as a planar surface on which casters (31), installed to the bottom of the product, are able to roll. Void spaces are formed within the lower part of board member.

Fig. 1



EP 1 547 931 A2

Description

1. Field of the Invention

[0001] The invention relates to a carrier apparatus on which various types of business machines are placed for shipment or storage.

2. Description of Related Art

[0002] When electrical products, including business machines such as photo copier and the like, are shipped or stored, it is required to prevent the electrical products from contacting other electrical products and being damaged during the shipment or the storage. In order to protect the electrical products, a packing apparatus (see Related Art Document 1) or a casing apparatus (see Related Art Document 2) is provided. The packing apparatus packs the electrical product with shock absorber materials filled with air. The casing apparatus holds the electrical product between an upper fastening fixture and a lower fastening fixture.

[0003] Another shipping and storing apparatus also is known, in order to simplify handling the electrical products by freight-handling vehicle such as a fork lift, a pallet truck, and the like. The shipping and storing apparatus loads the business machine on a pallet, and then fastens the business machine on the pallet with fastening fixtures (see Related Art Document 3).

[Related Art Document 1]

[0004] Japanese Kokai (Laid Open) Patent No. 2000-62850

[Related Art Document 2]

[0005] Japanese Kokai (Laid Open) Patent No. 2001-114382

[Related Art Document 3]

[0006] Japanese Kokai (Laid Open) Patent No. H10-95429

[0007] The above-noted packing apparatus and casing apparatus are configured to be re-used for a predetermined times and thus can reduce refusal materials. However, the above-noted packing apparatus and casing apparatus do not have enough structures to further advance economizing and recycling, because the packing apparatus and the casing apparatus are made of a number of different materials and are weakly made from thin synthetic resin. On the other hand, the above shipping and storing apparatus, which fastens the electrical product on the pallet, are made of a fewer number of materials and are firmly made from thick synthetic resin or metal. Thus, this type of apparatus has sufficient endurance to be re-used for a longer period of time and is

better than the above-noted packing apparatus and casing apparatus with respect to the advance of economizing and recycling.

[0008] However, the above shipping and storing apparatus has the following problem. It is difficult for the shipping and storing apparatus to adapt an electrical product with a different size or shape from a predetermined size or shape. Therefore, when there are many types of electrical products regarding sizes or shapes, many types of the shipping and storing apparatuses have to be prepared for each type of electrical products. This causes costs to rise and gives bad effects to economizing and recycling. Even if the shipping and storing apparatus is made to be re-used, the shipping and storing apparatus can not adapt many types of electrical products with different sizes or shapes. Thus, when a new type of the electrical product has a different size or shape from a former product, the shipping and storing apparatus can not be used for the new type of the electrical product. Therefore, the shipping and storing apparatus can be re-used only for a limited time and can not advance economizing and recycling over a long period of time.

SUMMARY OF THE INVENTION

[0009] The invention puts forth a carrier apparatus that resolves the shortcomings noted in the related art; the main purpose of the invention being to provide a carrier apparatus that easily adapts to business machines of various sizes and shapes, and that encourages recycling and the conservation of raw materials.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The present invention is further described in the detailed description which follows, with reference to the noted plurality of drawings by way of non-limiting examples of exemplary embodiments of the present invention, in which like reference numerals represent similar parts throughout the several views of the drawings, and wherein:

Figure 1 is a perspective view of the first embodiment of the business machine shipping and storage structure.

Figure 2 is a cross section of the clamping fixture of the Figure 1 embodiment.

Figure 3 is a cross section of the clamping fixture of the Figure 1 embodiment.

Figure 4 is a top view of the Figure 1 embodiment. Figure 5 is a cross section of the Figure 1 embodiment.

Figure 6 is a perspective view of the second embodiment of the business machine shipping and storage structure.

Figure 7 is a top view of the Figure 6 embodiment. Figure 8 is a cross section of the Figure 6 embodi-

ment.

Figure 9 is a cross section showing the Figure 6 rubber pieces in an installed condition.

Figure 10 is a perspective view of the third embodiment of the invention.

Figure 11 is a cross section of the protective cover shown in Figure 10.

Figure 12 is a perspective view of the fourth embodiment of the invention.

Figure 13 is a side view of the Figure 12 embodiment.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

First Embodiment

[0011] Figure 1 is a perspective view of the first embodiment of the carrier apparatus of the present invention. In this embodiment, the carrier apparatus comprises platform 2 that includes support surface 1 on which business machine 'A' (hereafter referred to as "product 'A'") is placed, and clamping fixtures 3 that are able to secure product 'A' to platform 2 at the variable positions through attachment structures formed on support surface 1. Groove 6, to which bolt 5 (fastening device) attaches, is formed on platform 2, therefore clamping fixture 3 may attach to platform 2 at any position within the length of groove 6.

[0012] Like a common loading pallet, platform 2 includes upper board member 11, lower board member 12, post parts 13 that connect the upper and lower board members 11 and 12 for the insertion of the fork of a freight-handling vehicle such as a fork lift or pallet truck. Platform 2 is made from an aluminum alloy to provide both strength and light weight.

[0013] Upper board member 11, which comprises the upper part of platform 2, includes support surface 1 on which product 'A' is placed, and rubber block (shock absorbing member) 15 that inserts between support surface 1 and product 'A' in order to prevent product 'A' from having damages that could result from vibration and shocks encountered during shipping.

[0014] Figure 2 is a cross section illustrating a detailed view of clamping fixture 3 and showing plane figure cut along the groove 6. Clamping fixture 3 comprises clamp plate 24. Clamp plate 24 comprises clamp flange 23 (clamping member). Clamp flange 23 engages clamp orifice 22. Clamp orifice 22 is provided on frame member (chassis) 21 and exposes a lower surface of the business machine. Clamp orifice 22 comprises a hole and a hollow. Clamping fixture 3 also comprises a fastening device including bolt 5 and nut 25. The fastening device clamp secures plate 24 to platform 2.

[0015] Clamp plate 24 comprises horizontal part 27 and vertical part 28. Horizontal part 27 locates along support surface 1 of platform 2. Vertical part 28 vertically

extends upward from one end of horizontal part 27. Clamp plate 24 is formed by cutting sheet metal in a predetermined shape and being bent. Horizontal part 27 comprises a thru-hole for the insertion of bolt 5. Clamp flange 23 horizontally protrudes from the upper end of vertical part 28. When Clamp flange 23 is inserted upward through clamp orifice 22 of the business machine and is slid horizontally over the edge of clamp orifice 22 until clamp flange engages an edge of clamp orifice 22, frame member 21 of the business machine is fastened on support surface 1 of platform 2. 31 is a caster of the business machine.

[0016] Figure 3 is a cross section illustrating a detailed view of clamping fixture 3 and showing plane figure cut in a crossing direction of the groove 6. Bolt 5 is inserted through the open end of groove 6. The open end of groove 6 is formed to a width narrower than the head of bolt 5, so the head of bolt 5 engages shoulder part 33 of the open end. On the other hand, the floor part of groove 6 is formed to a width that does not restrict the movement of the head of bolt 5. Groove 6 has an inverted T-shape cross section along the entire length of the groove.

[0017] Therefore, when bolt 5 and nut 25 are mutually loosened, clamping fixture can be allowed to slide along groove 6. Thus, clamp plate 24 can be set at a position where clamp flange 23 of clamp plate 24 can properly engage the business machine. After that, bolt 5 is tightened on nut 25, so clamps shoulder part 33 of groove 6 is sandwiched between the head of bolt 5 and horizontal part 27 of clamp plate 24. Thereby clamp plate 24 is strongly secured against platform 2.

[0018] Figure 4 is a plan view of the carrier apparatus shown in Figure 1. Each groove 6 extends from the external edge toward the center of support surface 1. In this embodiment, in order to adequately secure product 'A' of a square case, grooves 6 extend in a straight line from the corners of square-shaped support surface 1 toward the center, and each of four grooves 6 is located at each of the four corners of platform 2. Further, four grooves 6 are also provided on platform 2, and each of four clamping fixture 3 is arranged on each of four grooves 6. Thus, product 'A' is secured to platform 2 at each of the four corners of product 'A' by the respective clamping fixture 3.

[0019] Because the clamping position of each clamping fixture 3 may be located at any point along its respective groove 6, clamping fixtures 3 can be easily positioned to accommodate either product 'A' or 'B' which are of different size and shape. Also, either product 'A' or product 'B' is secured in a stable condition for shipment and storage because either product 'A' or product 'B' is fastened at the center of support surface 1.

[0020] Figure 5 is a cross sectional view of the carrier apparatus shown in Figure 1. Support surface 1 is formed as a flat plane on the upper surface of upper board member 11. Casters 31 are attached to the bottom part of product 'A' and are able to roll on support

surface 1. Thus, product 'A' can easily move to any position on support surface 1. Furthermore, when a ramp (not shown in the drawings) is set next to platform 2, product 'A' can be easily moved and loaded from the outside of platform 2 onto support surface 1 of platform 2.

[0021] In order to reduce weight, void spaces 32 may be formed by the removal of material from lower board member 12. Lower board member 12 has no functional relationship to support surface 1 on which product 'A' may be moved. Thus, void spaces 32 will have no adverse effect on the movement of product 'A' on support surface 1.

[0022] The carrier apparatus described by the invention is constructed of platform 2, clamping fixtures 3, and rubber blocks 15. The carrier apparatus is assembled from a few components, but is robust. The carrier apparatus offers durability that allows it to be used repeatedly over a long period of time, is able to easily adapt to differently sized and shaped products, and encourages recycling and the conservation of raw materials. Moreover, product 'A' is loaded onto platform 2, as previously noted, and then is temporarily lifted. After that, clamp flange 23 of clamping fixture 3 can be placed into orifice 22 on the lower surface of product 'A' (see Figure 2), and rubber block 15 can be placed between support surface 1 and the lower surface of product 'A'.

Second Embodiment

[0023] Figure 6 is a perspective view illustrating a second embodiment of the carrier apparatus of the present invention. In this second embodiment, product 'A' is placed on support surface 41 of platform 42. A plurality of clamping holes 43 are arranged on platform 42. The plurality of clamping holes can engage bolts 5 of clamping fixture 3. Thereby, a location, where product 'A' is clamped to platform 42, can be adjustable.

[0024] Furthermore, in this second embodiment, platform 42 includes base part 51 in which void spaces are provided for the insertion of a loading vehicle fork. Platform 42 also comprises load board 52 which is located above base part 51 and whose upper side is structured as support surface 41. Platform 42 further contains rubber piece (shock absorbing member) 53 which is placed between load board 52 and base part 51 to prevent product 'A' from receiving damage by absorbing vibrations and shocks encountered during shipping.

[0025] Figure 7 provides a plan view of the carrier apparatus shown in Figure 6. Multiple clamping holes 43 are arranged in a line extending from the edge of support surface 41 toward the center. In this embodiment, there are four groups of clamping holes 43, each group extending inward in linear alignment from each of the four corners toward the center of support surface 41. Each of four clamping fixtures 3 is, in the manner as noted in the previous embodiment, secured to one of the holes in each of the four groups of holes in order to clamp the

four corners of product 'A' to platform 42.

[0026] At this time, one of the holes from each group of clamping holes 43 is selected as the hole to which clamping fixture 3 will be attached. Thus, the attachment position of clamping fixture 3 can be gradually selected at one of multiple positions. Through this mechanism, the attachment structure is able to accommodate differently sized and shaped products 'A'. Moreover, product 'A' is shipped and stored in a stable condition because product 'A' is secured at the center of support surface 41. Compared to the previously noted attachment structure, although the attachment position of this structure is more limited, this structure provides the advantage of more securely attaching product 'A' to support surface 41.

[0027] Figure 8 is a cross sectional view of the embodiment shown in Figure 6. Load board 52 is a flat structure that incorporates support surface 41 so that casters 31 of product 'A' can roll on support surface 41. Like the previous embodiment, a operation, in which product 'A' is loaded and positioned on support surface 41, is made easier because product 'A' can be easily moved on support surface 41.

[0028] Base part 51 includes upper board member 55, lower board member 56, and post parts 57 which are located between upper and lower board members 55 and 56. Void spaces 61 and 62 are formed within upper and lower board members 55 and 56 to reduce weight of the carrier apparatus, but void spaces 61 and 62 are formed not to interfere with the movement of product 'A' on support surface 41.

[0029] Load board 52 is made of aluminum alloy plate, and base part 51 is made of synthetic resin. Therefore, load board 52 is rigid enough to adequately support product 'A', and the entire structure is designed to be light in weight. Compared to the previous embodiments, this structure requires a few more components, but the use of thickly formed synthetic resin and metal components provides for a durable structure that can be repeatedly used over an extended period of time. Thus, this structure can promote recycling and the conservation of raw materials.

[0030] Figure 9 is a cross sectional view of the rubber piece (shown in Figure 6) in an installed condition. Holes 65 and 66 are respectively provided in load board 52 and rubber piece 53. Clamp bolt 64 is inserted into holes 65 and 66. Clamp bolt 64 serves as a connecting member there between. With clamp bolt 64 inserted to holes 65 and 66, clamp bolt 64 is tightened into threaded hole 67 of base part 51. Rubber piece 53 is compressed between load board 52 and base part 51. Thereby, rubber piece 53, load board 52 and base part 51 are connected with each other. In this condition, because rubber piece 53 is elastically deformed, rubber piece 53 can absorb vibration and shock applied to base part 51.

Third Embodiment

[0031] Figure 10 is a perspective view of a third embodiment of the carrier apparatus of the present invention. This third embodiment comprises platform 2 and clamping fixture 3 shown in the first embodiment illustrated in Figure 1. The third embodiment further comprises protective cover 71 which covers product 'A'. Protective cover 71 protects product 'A', which is installed on support surface 1 of platform 2, from dirt and rain.

[0032] Protective cover 71 is a bag-like structure covering five of the six surfaces of product 'A' (the lower surface is not covered). Protective cover 71 includes separating part 72 that may be joined by fastening part 73. Separating part 72 extends vertically along the approximate complete height of cover 71. Also, tie string (constricting device) 75 is provided at edge part 74 at the lower end of protective cover 71 within the hem of the bag-like structure. Tie string 75 may be tightened to constrict the lower opening of protective cover 71 as a method of securing cover 71 to product 'A'. Protective cover 71 can prevent dirt and rain from invading the inside of protective cover 71.

[0033] Figure 11 is a cross section of the protective cover shown in Figure 10. Protective cover 71 is made from a sheet material in which shock absorbing layer 81, which is made from a synthetic foam resin such as Mirror Mat or the like, is sandwiched between cover layers 82 and 83, which is made from polyethylene. Protective cover 71 is thus able to protect the product from shock during transport, and can be used repeatedly for an extended period of time due to its strong and durable construction.

Fourth Embodiment

[0034] Figure 12 is a perspective view of a fourth embodiment of the carrier apparatus of the present invention. This embodiment comprises clamping fixture 3 and platform 102 that carries product 'A' on support surface 1. This embodiment also incorporates framework 103. Framework 103 allows platform 102, on which product 'A' is secured, to be stacked upon another platform 102, on which another product 'A' is secured. Framework 103 is constructed of four gate-like frame members 111 through 114. Frame members 111 through 114 are erected on platform 102 to form framework 103. Framework 103 surrounds product 'A' on support surface 101.

[0035] Platform 102 is generally similar to platform 2 of the first embodiment shown in Figure 1. Platform 102 comprises blind holes 116. Each of blind holes 116 is provided at a corner of support surface 101 to be attached to framework 103. The bottom ends of taller gate-like frame members 111 and 113 are inserted into blind holes 116 to be secured to platform 102. The shorter gate-like frame members 112 and 114 are secured to frame members 111 and 113 by threaded fasteners.

[0036] In order to aid handling, each gate-like frame

member 111 through 114 includes grip member 118. Grip member 118 is configured horizontally at the approximate midpoint of each of the frame members 111 through 114. Frame members 111 through 114 are fabricated from metal pipes. Surfaces of the metal pipes are covered by a layer of synthetic resin.

[0037] Two stacking channels 121 are formed within the lower side of platform 102. Stacking channels 121 can join the top parts of frame members 111 and 113 of another carrier apparatus when a carrier apparatus is stacked upon the another carrier apparatus. Stacking channels 121 are formed along the edges of platform 102 where frame members 112 and 114 are located. Stacking channels 121 also have openings at the edges of platform 102 where frame members 111 and 113 are located.

[0038] Figure 13 is a side view showing two carrier apparatuses stacked one upon the other. The top parts of frame members 111 and 113 of the lower carrier apparatus are inserted to stacking channels 121 on the bottom of platform 102 of the upper carrier apparatus. Thus, the upper carrier apparatus is stacked on the lower carrier apparatus and is oriented 90-degrees with respect to the lower carrier apparatus. Thereby, the upper carrier apparatus is stabilized on the lower carrier apparatus. Moreover, the upper carrier apparatus can be stacked on the lower carrier apparatus without contacting with product 'A' on the lower platform 102. Therefore, the weight of the upper carrier apparatus does not influence the product 'A' located placed on the lower carrier apparatus.

[0039] It is noted that the foregoing examples have been provided merely for the purpose of explanation and are in no way to be construed as limiting of the present invention. While the present invention has been described with reference to exemplary embodiments, it is understood that the words which have been used herein are words of description and illustration, rather than words of limitation. Changes may be made, within the purview of the appended claims, as presently stated and as amended, without departing from the scope and spirit of the present invention in its aspects. Although the present invention has been described herein with reference to particular structures, materials and embodiments, the present invention is not intended to be limited to the particulars disclosed herein; rather, the present invention extends to all functionally equivalent structures, methods and uses, such as are within the scope of the appended claims.

[0040] The present invention is not limited to the above described embodiments, and various variations and modifications may be possible without departing from the scope of the present invention.

[0041] This application is based on the Japanese Patent Application No. 2003-426704 filed on December 24, 2003, entire content of which is expressly incorporated by reference herein.

Claims

1. A carrier apparatus on which a product is placed when the product is transferred, the carrier apparatus comprising:

a surface configured to support the location of the product on the carrier apparatus to prevent movement of the product with respect to carrying the product; and
fixing members configured to fix the product on the surface of the carrier apparatus, the fixing members being further configured to be adjustable based on a size of the supported product.

2. The carrier apparatus according to claim 1, wherein the surface has grooves within which the fixing members slide.

3. The carrier apparatus according to claim 2, wherein each groove extends in a direction from the center of the carrier apparatus to an edge of the carrier apparatus.

4. The carrier apparatus according to claim 2, wherein each groove extends in a direction from the center of the carrier apparatus to a corner of the carrier apparatus.

5. The carrier apparatus according to claim 1, wherein the surface has a plurality of holes in which the fixing members are selectively fixable.

6. The carrier apparatus according to claim 5, wherein the plurality of holes are arranged in groups, the holes of each group extends in a direction from the center of the carrier apparatus to an edge of the carrier apparatus.

7. The carrier apparatus according to claim 5, wherein the plurality of holes are arranged in groups, the holes of each group extends in a direction from the center of the carrier apparatus to a corner of the carrier apparatus.

8. The carrier apparatus according to claim 1, further comprising bumpers configured to be inserted between the surface of the carrier apparatus and the bottom of the product.

9. The carrier apparatus according to claim 1 further comprising bumpers configured to be inserted between the surface of the carrier apparatus and the bottom of the product, wherein the bottom of the product comprises clamp orifices, the fixing members comprises protruding members, the fixing members fix the product on the surface of the carrier

apparatus by inserting the protruding members into the clamp orifices of the bottom of the product, and the bumpers are attached to the fixing members to be inserted between the surface of the carrier apparatus and the bottom of the product.

10. The carrier apparatus according to claim 1, wherein the carrier apparatus comprises a upper board and a lower board, the upper board having the surface that supports the product, the apparatus having pillars connecting the upper board with the lower board, and the lower board has a hole, the hole reducing weight of the carrier apparatus.

11. The carrier apparatus according to claim 1, wherein the surface of the carrier apparatus comprises aluminum.

12. The carrier apparatus according to claim 1, wherein the carrier apparatus comprises a carrier board, the carrier board supporting the product, the carrier board comprising aluminum, and another part of the carrier apparatus comprising synthetic resin.

13. The carrier apparatus according to claim 1, further comprising a cover configured to cover the entire product on the carrier apparatus.

14. The carrier apparatus according to claim 13, wherein the cover has a bumper portion of elastomeric resin.

15. The carrier apparatus according to claim 13, wherein the cover has an opening and is configured to as a bag, the opening being directed downward when the cover covers the product on the carrier apparatus, and the opening being tightenable about a product by a cord member.

16. The apparatus according to claim 1, further comprising a framework configured to enclose the entire product on the carrier apparatus.

17. The apparatus according to claim 16, wherein the framework is stacked on another framework, the framework enclosing a product on a carrier apparatus, and the another framework enclosing another product on another carrier apparatus.

18. The apparatus according to claim 16, wherein the framework has a grip, the grip being utilized when the carrier apparatus is transferred.

Fig. 1

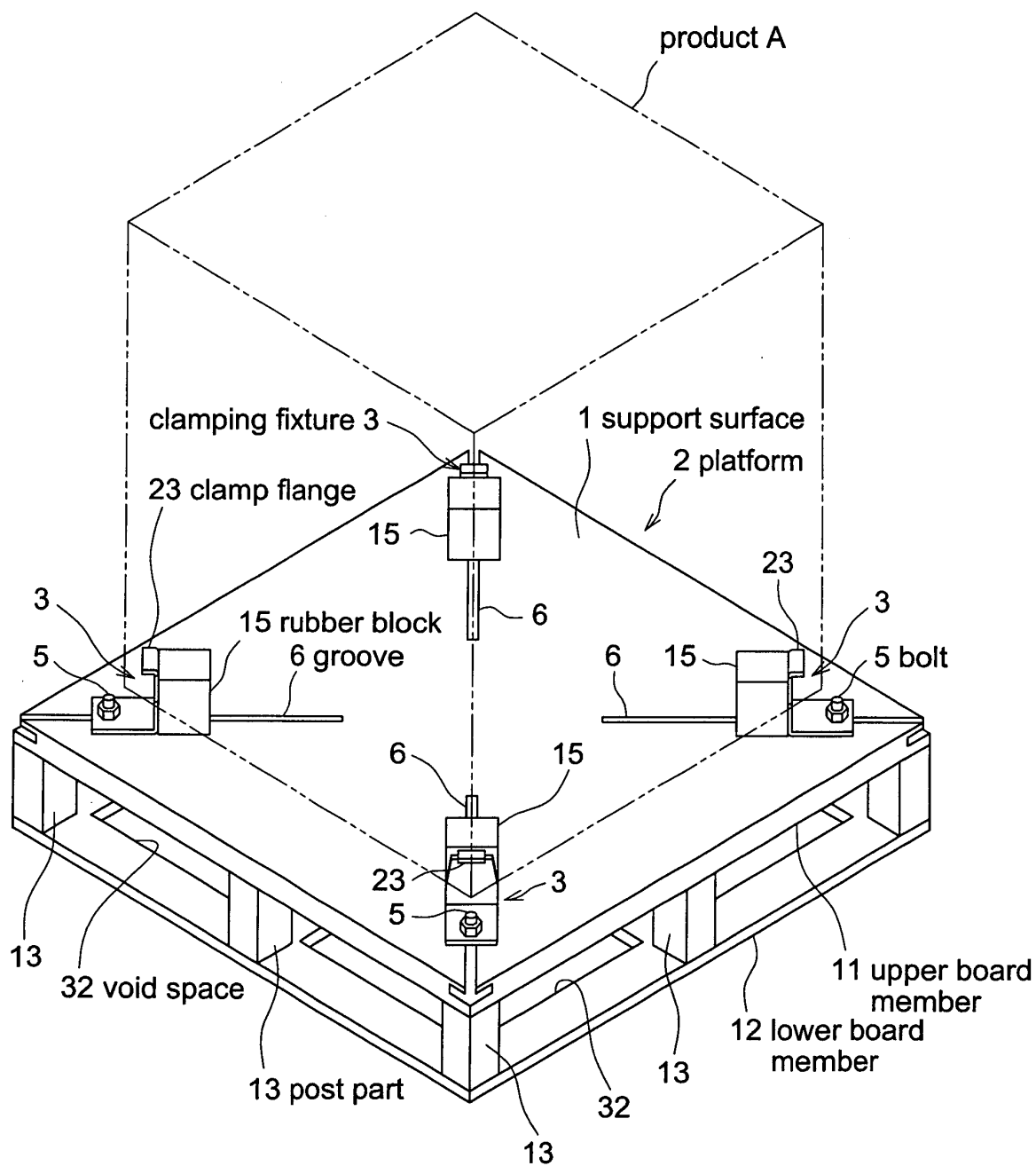


Fig.2

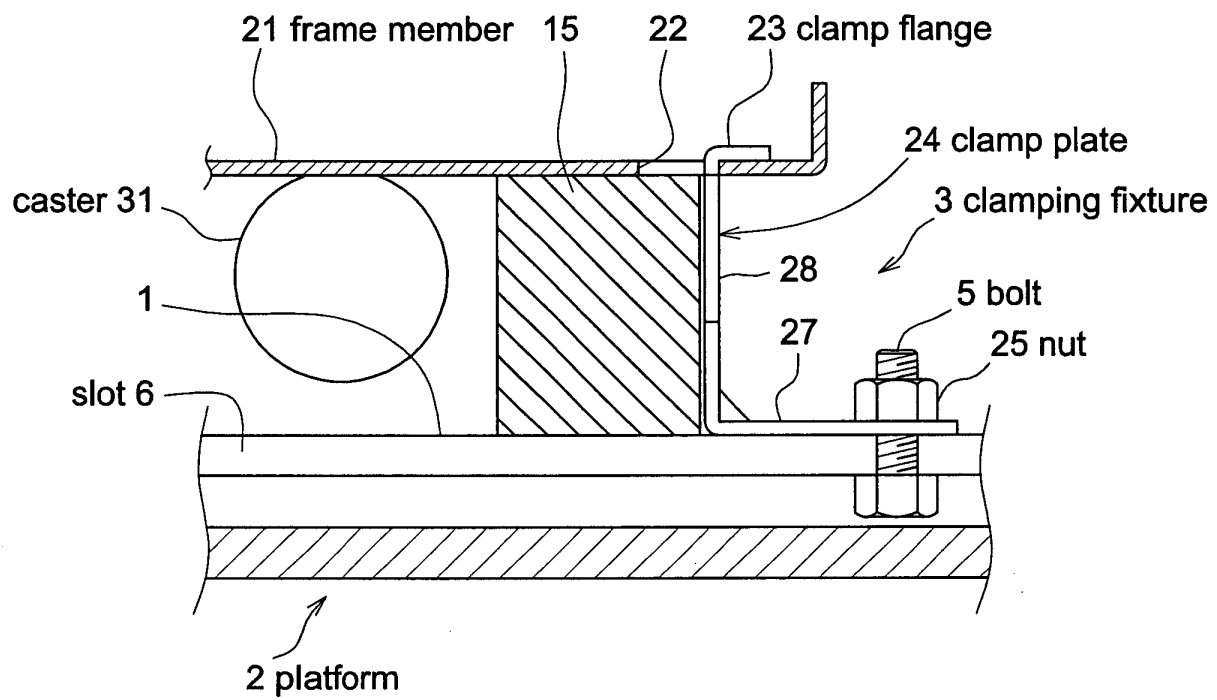


Fig.3

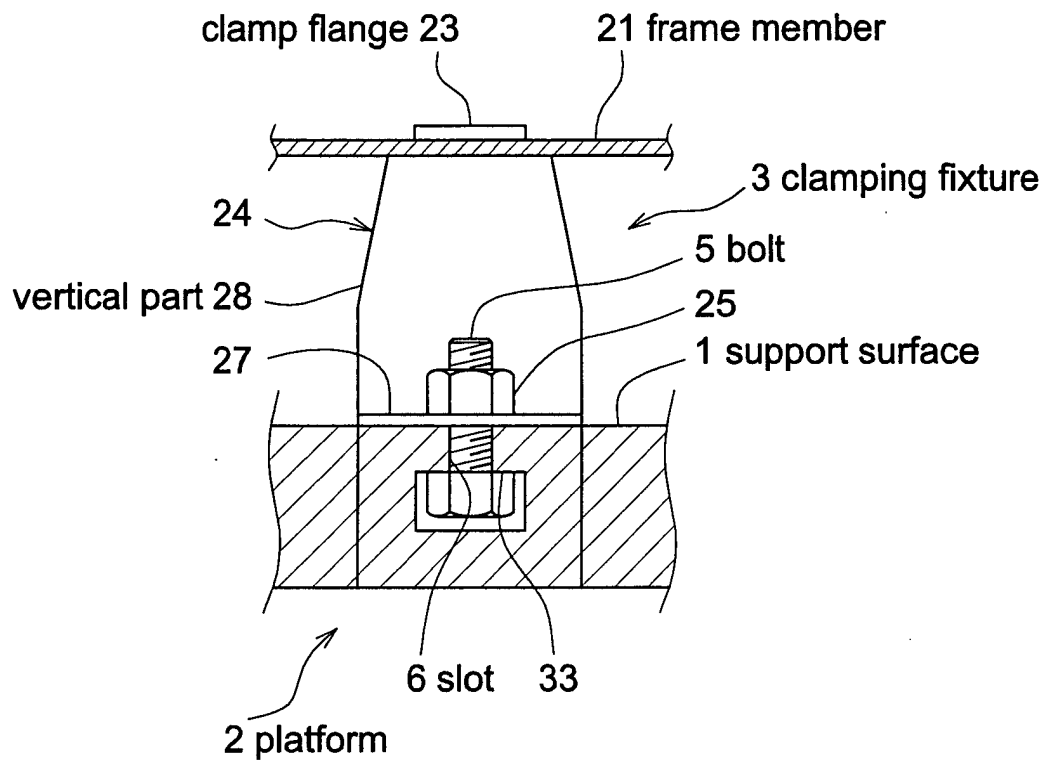


Fig.4

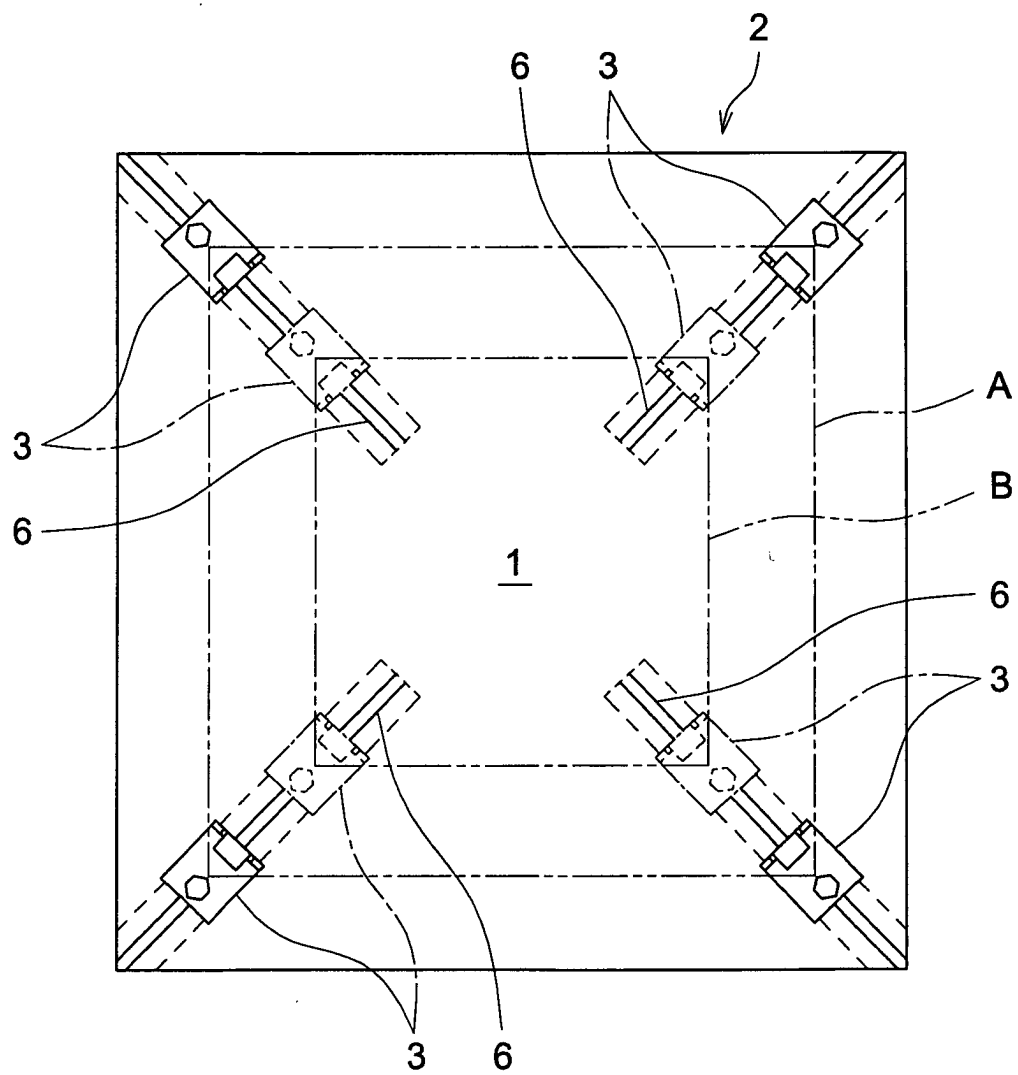


Fig.5

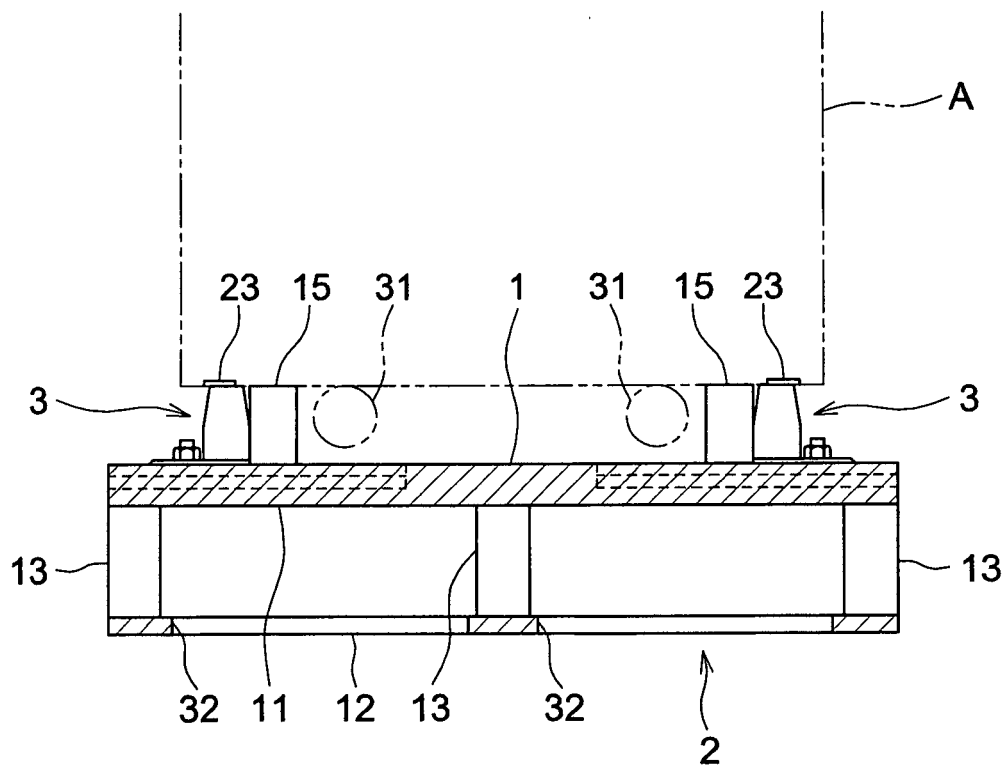


Fig. 6

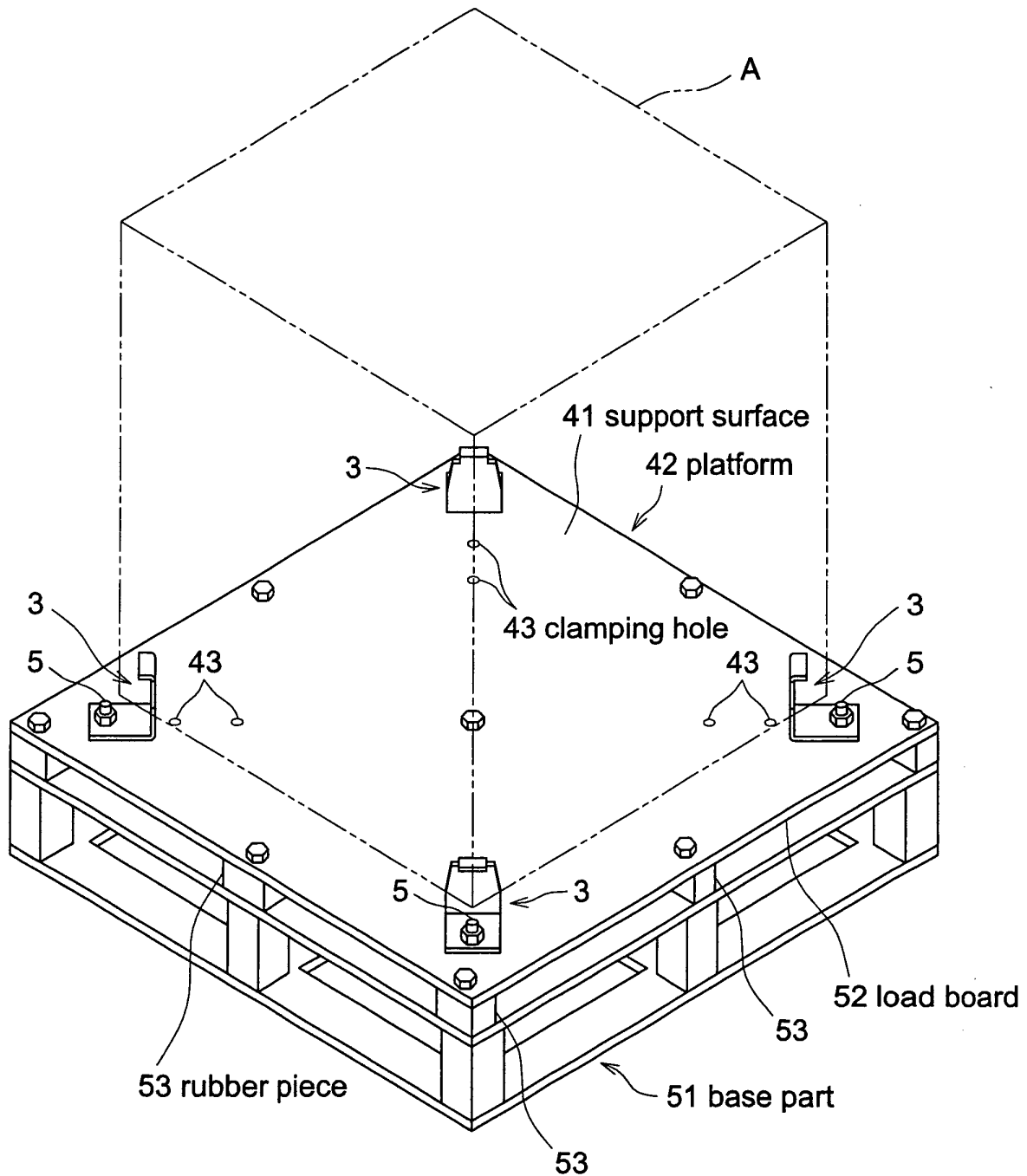


Fig. 7

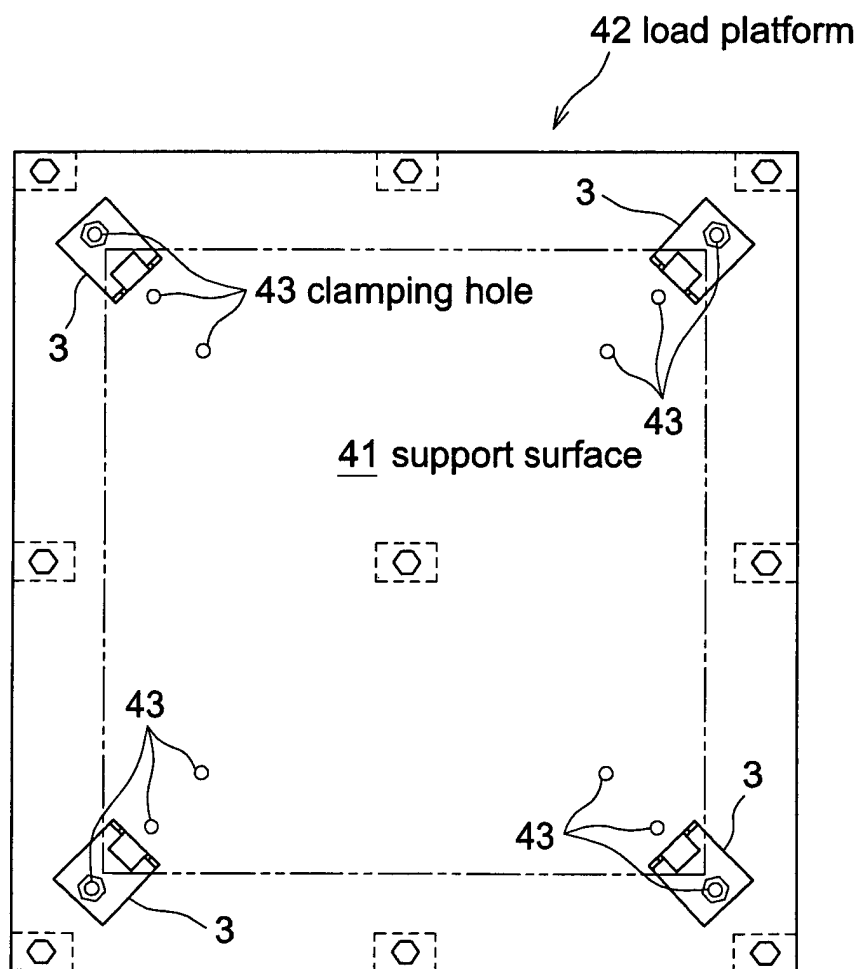


Fig. 8

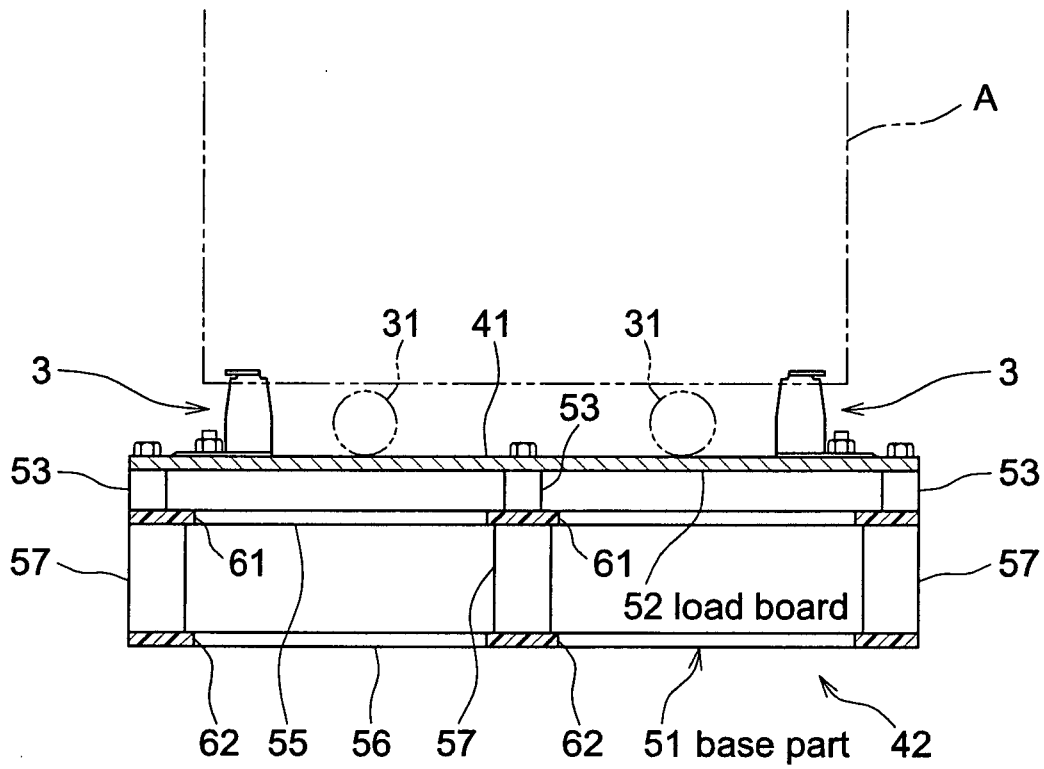


Fig. 9

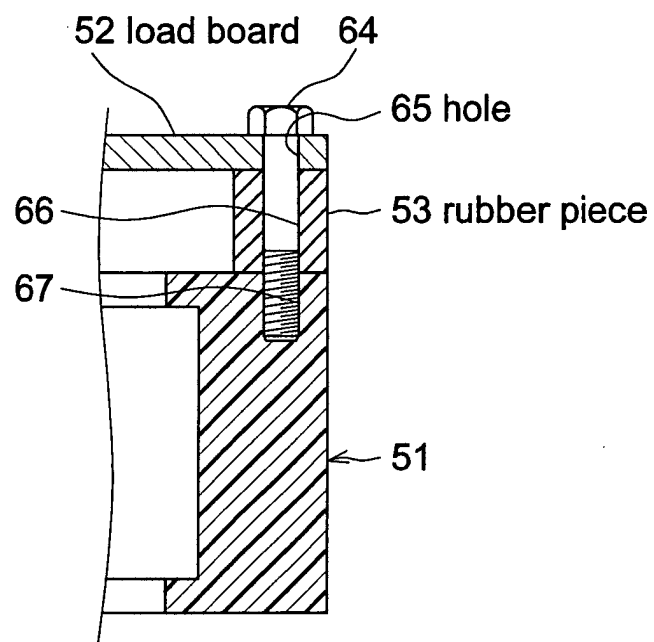


Fig.10

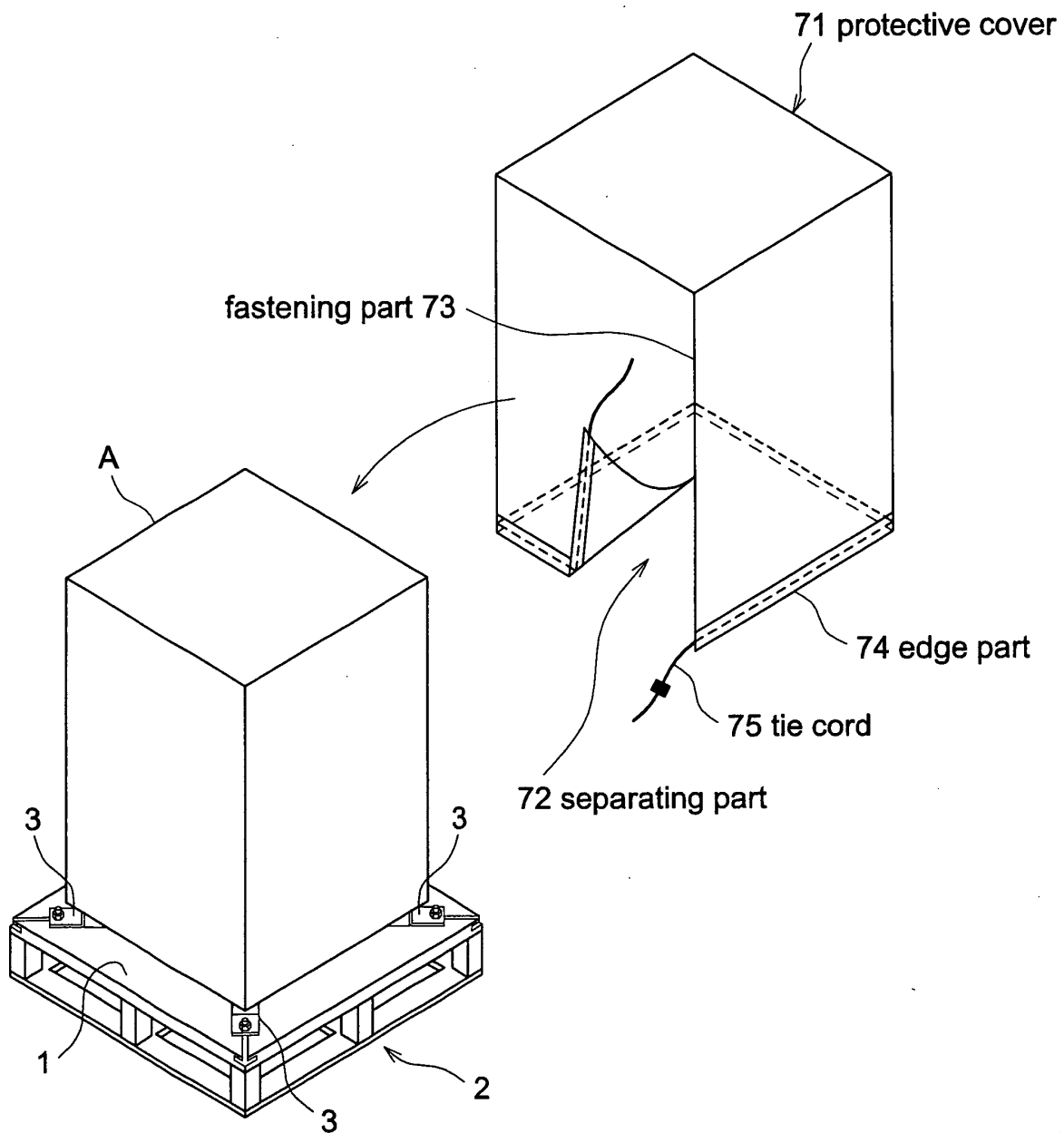


Fig.11

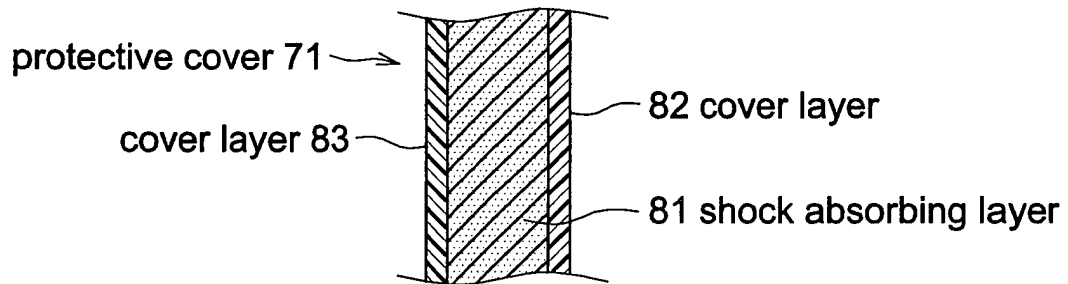


Fig.12

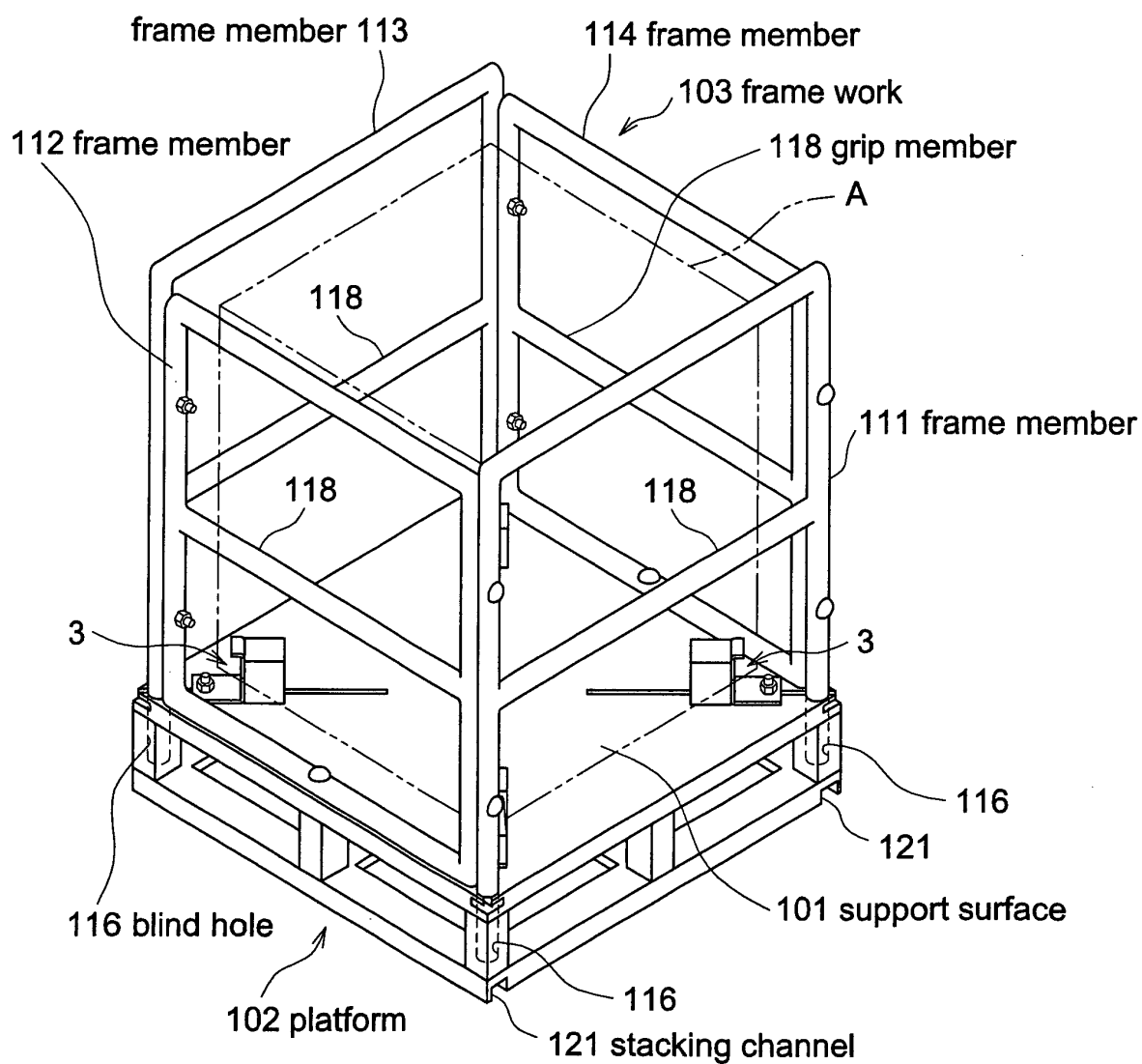


Fig.13

