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(54) **An apparatus for transportation**

(57) The apparatus for transportation (A) according to the present invention is provided for the carriage of the panels of display devices.

The said apparatus (A) comprises one vertical foot (1) on each corner thereof; foot connection profiles (3) connecting the said feet (1); support profiles (4) connecting the foot connection profiles (3) to each other. The said apparatus (A) also comprises a pair of side frames

(10,11) that can be folded inwardly towards each other; at least one lower slot (6) which is located on the two opposing side frames (10) and in which panels are placed; upper slots (8) in a corresponding number with each lower slot, which can be turned on the frame and on which the upper parts of the panels rest in such a manner that it is located on the other two opposing side frames (10) so as to be on the upper part of lower slots (6).

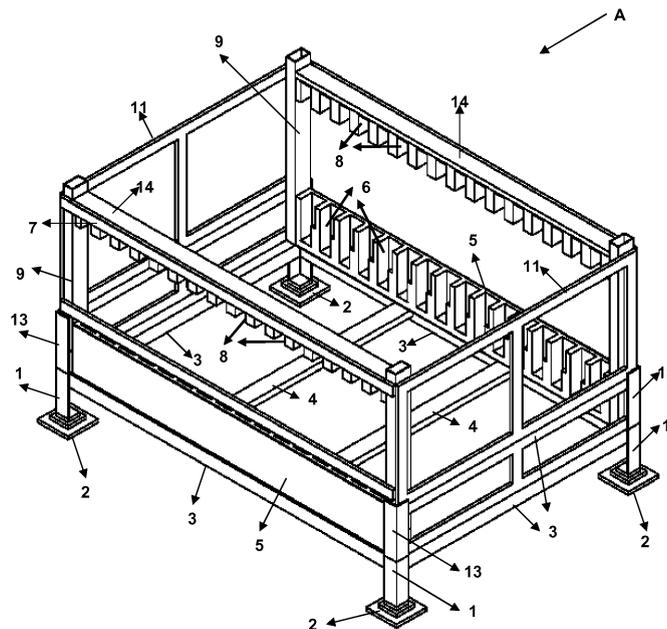


Figure- 1

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**Description****Technical Field**

[0001] The present invention relates to apparatuses for transportation of panels of such display devices as television, monitor (LCD, plasma, LED type).

**Prior Art**

[0002] In the state-of-the art, to ensure a reliable transport of panel-type display devices and many electronic appliances, the said devices are generally packed in cardboard boxes and styrofoam materials, and then they are placed on wooden or plastic pallets so as to be ready for transport. In this technique, there are problems such as the materials used for the packaging and transport being for single use only, use of too many materials during packaging, high costs of packaging manpower, and occupation of too much space by these materials and partial recycling character of these materials.

[0003] Furthermore, failure during procurement process of the materials such as Styrofoam, wooden pallets and cardboard boxes used in the prior art, quality problems, stock errors and damages occurring during logistics cause the halt of production during the manufacturing process of panels, ineffectiveness and delay in production. For instance, in the prior art each time the materials such as cardboard box, Styrofoam, wooden or plastic pallet, banding stripe and band fixing metal are purchased and stock control management is required and the missing items needs to be made up by monitoring deficiencies. Since according to the existing system the item number in packaging is 10-24, stock control gets difficult and a lack of an item, a delay in procurement and/or a sudden deficiency may hinder the panel production.

[0004] In the published patent application nos. JP2006290384, US5423422A, US2005155904 according to the state of the art, some examples of the materials used for packaging and transport are disclosed. In these examples, large materials which are difficult to recycle are disclosed for packaging and transport process.

[0005] In addition to those mentioned above, stacking of materials described in these samples on each other is also limited.

**Brief Description of the Invention**

[0006] The present invention relates to a packaging technique and manpower as well as technical fields of product logistics. The invention provides reusable apparatuses for transportation/carriage instead of single-use packaging materials (pallet, cardboard box, styrofoam etc.) used in transportation and carriage of panels of such display devices as LCD, plasma, LED type television or monitor. In this manner, packaging system of the said panel can be turned into a recyclable system. Moreover,

the costs of packaging workmanship and the materials used in production of panel substantially decrease. In addition, a great deal of savings are achieved in internal and external logistics costs.

5 [0007] As the apparatus according to the present invention is recyclable, it is possible to use it many times. When compared to the materials used in the state-of-the art, it enables savings in storage, logistics and workmanship costs because of the fact that it occupies less space and has an integral character in contrast to old method. 10 (In this invention, the item number of packaging material in a pallet, for example, can be reduced from 10-24 to 1. In this way, it can be possible to reduce the purchasing, procurement and storage workmanship costs concerning 15 packaging material to minimum. Furthermore, the need for packaging workmanship in the panel production process substantially decreases owing to ease of the work.

[0008] The apparatus for transportation according to the present invention is provided for the carriage of the 20 panels of display devices. The said apparatus comprises one vertical foot on each corner thereof; foot connection profiles connecting the said feet; support profiles connecting the foot connection profiles to each other.

[0009] The said apparatus also comprises a pair of 25 side frames that can be folded inwardly towards each other; at least one lower slot which is located on the two corresponding side frames and in which panels are placed; upper slots in a corresponding number with each 30 lower slot, which can be turned on the frame and on which the upper parts of the panels rest in such a manner that it is located on the other corresponding two side frames so as to be on the upper part of lower slots.

**Objects of the Invention**

[0010] The object of the present invention is to provide 35 an apparatus for transportation leading to an increase in the number of television or monitor panels that may be stocked and carried per unit of volume.

40 [0011] Another object of the invention is to prevent any damage or fall of panels and packages during transportation, for example during the carriage by vehicle and container.

[0012] A further object of the invention is to reduce the 45 gaps observed in the enclosed volume such as container to a minimum level during carriage of panels by the apparatus for transportation.

[0013] A still further object of the invention is to ensure 50 a decline in the consumption of forestry and petroleum products by reducing the use of cardboard box, wooden or plastic pallet.

[0014] A still further object of the invention is to develop 55 a recyclable carriage/transportation system that can be used more than once instead of disposable packaging and carriage materials.

### **Brief Description of the Figures**

**[0015]** An exemplary apparatus for transportation according to the present invention is given in the annexed figures, wherein;

Figure 1 is a perspective top view of the apparatus for transportation.

Figure 2 is a perspective bottom view of the apparatus for transportation.

Figure 3 is a perspective view of the apparatus for transportation in a folding position.

Figure 4 is a perspective view of the apparatus for transportation as folded.

Figure 5 is a perspective view of the apparatus for transportation as superimposed.

Figure 6 is a perspective view of the upper slots in an open position.

Figure 7 is a perspective view of the panels as arranged in the apparatus for transportation.

**[0016]** The parts in the figures are numbered one by one and the corresponding terms of these numbers are given below.

Apparatus for transportation (A)

Vertical foot (1)

Foot base (2)

Foot connection profile (3)

Support profile (4)

Housing profile (5)

Lower slot (6)

Upper profile (7)

Upper slot (8)

Vertical side profiles (9)

Side frame (10)

Side frame (11)

Hinge (12)

Extension (13)

Upper cover (14)

### **Disclosure of Invention**

**[0017]** The apparatus for transportation (A) illustrated in Figures 1-5 is provided for carriage of panels of such display devices as LCD, plasma, LED television or monitor. The said apparatus (A) comprises one vertical foot (1) on each corner thereof and foot connection profiles (3) connecting the said feet (1). In order to increase the strength of the apparatus (A), vertical feet (1) are connected to each other with foot connection profiles (3). Likewise, there is provided support profiles (4) which connect the foot connection profiles (3) to each other so as to increase the strength.

**[0018]** In Figures 3-4, perspective views of the apparatus for transportation (A) in a foldable position are given. The said apparatus (A) has foldable side frames (10, 11) on the upper part of the feet (1), the foot connection profiles (3) and the support profiles thereof. For example,

two opposing side frames (10) can fold towards each other as illustrated in Figure 3. The side frames (10) comprises a housing profile (5), a lower slot (6), an upper profile (7), an upper slot (8) and vertical side profiles (9) as shown in Figures 1-3. Each side frame (10) has two side profiles (9), and these profiles (9) are connected to the said housing profile (5) from their bottom parts and connected to upper profile (7) from their upper parts so as to form a frame. Furthermore, each of the said side frames (10) is connected to vertical feet (1) and/or foot connection profiles (3) by at least one hinge (12) (Figure 3). Both frames (10) can fold inwardly towards each other within the apparatus (A) through the hinges (12).

**[0019]** In the open position of the side frames (10) (unfolded position or vertical position), two opposing frames (10) have at least one lower slot (6) thereon so as to arrange the panels within the apparatus (A). (Figure 7). The said lower slots (6) are provided on the housing profiles (5), and the panels are placed therein such that they are inserted from top to down. The placement of panels into the slots (6) prevents lateral and downward movement thereof.

**[0020]** Besides the insertion of bottom parts of panels into lower slots (6), upper slots (8) above the lower slots (6), which are in a corresponding amount to the lower slots, are also provided in order to support the panels from top. The upper slots (8) are also connected to the upper profiles (7) (or side frames (10)) by at least one hinge (12), and can be turned on the said upper profiles (7). In this manner, upper slots (8) can be turned during the placement of panels so as to allow the insertion of the panels from the top (Figure 6), and after the insertion of the said panels they can be turned again so as to support the upper parts of the panels by being inserted on and between the panels. In order to prevent the upward movement of upper slots (8) after covering the top of panels by turning the upper slots (8) thereon, at least one cover (14) can be fixed between both vertical side profiles (9) (or on the side frame (10)) so as to avoid the movements of these slots (8).

**[0021]** As shown in Figure 4, the other two opposing side frames (11) are connected to vertical feet (1) and/or foot connection profiles (3) by at least one hinge (12). These side frames (11) can also fold inwardly towards each other by means of hinges (12) within the apparatus (A).

**[0022]** Following the transport of the panels, less space is occupied by folding the side frames (10,11) of the apparatus (A) from the hinged (12) parts. By this means, they can be easily stocked or carried for the next transport.

**[0023]** When the frames (10, 11) are brought to the vertical position, they rest on the extensions (13) on the upper part of the feet (1), and reverse movement thereof is prevented. In other words, the said frames (10, 11) can only fold inwardly towards each other (into the apparatus (1)) and their vertical positions are maintained through resting on the said extensions (13).

**[0024]** There are provided foot bases (2) under the each vertical foot (1) to enable the apparatus (A) to settle smoothly on the ground in larger contact with the bottom surface. As the feet (2) are broad, the apparatuses (A) can be superimposed on one another in alignment (shown in Figure 5) and hence sliding of the apparatus on the top sideways is prevented.

**[0025]** Each apparatus (A), after being loaded with panels, can be packaged either individually or in a superimposed position. Furthermore, the existence of a certain space between the foot bases (2) of the apparatus (A) and the undermost foot connection profile (3) allows the entrance of various lifting/transport members (e.g. forks of forklift or pallet truck) under the said apparatus (A).

**[0026]** In order to enhance the strength of such load-bearing parts as feet (1), bases(2) and profiles(3,4,5,7) of apparatus (A) according to the weight of the panels, a great variety of materials such as metal, polymer or wood may be used in the production of the apparatus. The slots (6,8) contacting the panels can be produced from different materials (e.g. Styrofoam) which are to protect them against any impact.

## Claims

1. An apparatus (A) for transportation of panels of display devices, **characterized by** comprising:

one vertical foot (1) on each corner thereof (A);  
foot connection profiles (3) connecting the said feet (1) to each other;

support profiles (4) connecting the foot connection profiles (3) to each other;

a pair of side frames (10,11) above the feet (1), the foot connection profiles (3) and support profile, which can be folded inwardly towards each other;

at least one lower slot (6) which is located on the two opposing side frames (10) and in which panels are placed;

upper slots (8) in a corresponding number with each lower slot, which can be turned on the frame (10) and on which the upper parts of the panels rest in such a manner that it is located on the other opposing two side frames (10) so as to be on the upper part of lower slots (6).

2. An apparatus (A) for transportation according to Claim 1, **characterized in that** each of the side frames (10) is connected to vertical feet (1) by at least one hinge (12).

3. An apparatus (A) for transportation according to Claim 1, **characterized in that** each of the side frames (10) is connected to foot connection profiles (3) by at least one hinge (12).

4. An apparatus (A) for transportation according to Claim 1, **characterized in that** the upper slots (6) are connected to the side frames (10) by at least one hinge (12).

5. An apparatus (A) for transportation according to Claim 1, **characterized in that** there is provided a broad foot base (2) under the each vertical foot (1).

6. An apparatus (A) for transportation according to Claim 1, **characterized in that** it comprises the extensions (13), on which the frames (10, 11) rest in the vertical position, on the upper part of the feet (1).

7. An apparatus (A) for transportation according to Claim 1, **characterized in that** it comprises upper covers (14), which prevent the upward movement of upper slots (8) when the panels are arranged in the apparatus (A), on the side frames (10).

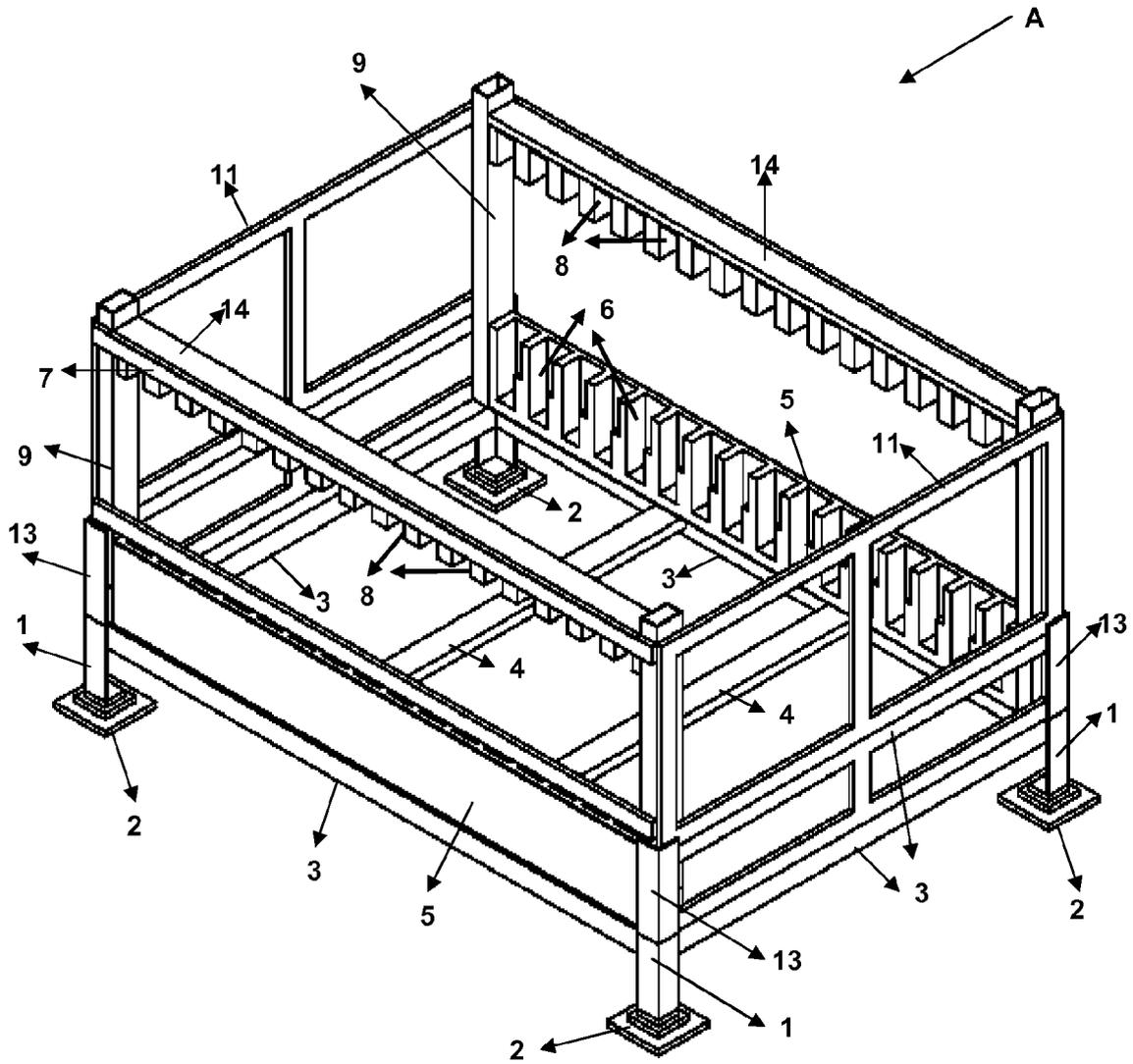


Figure- 1

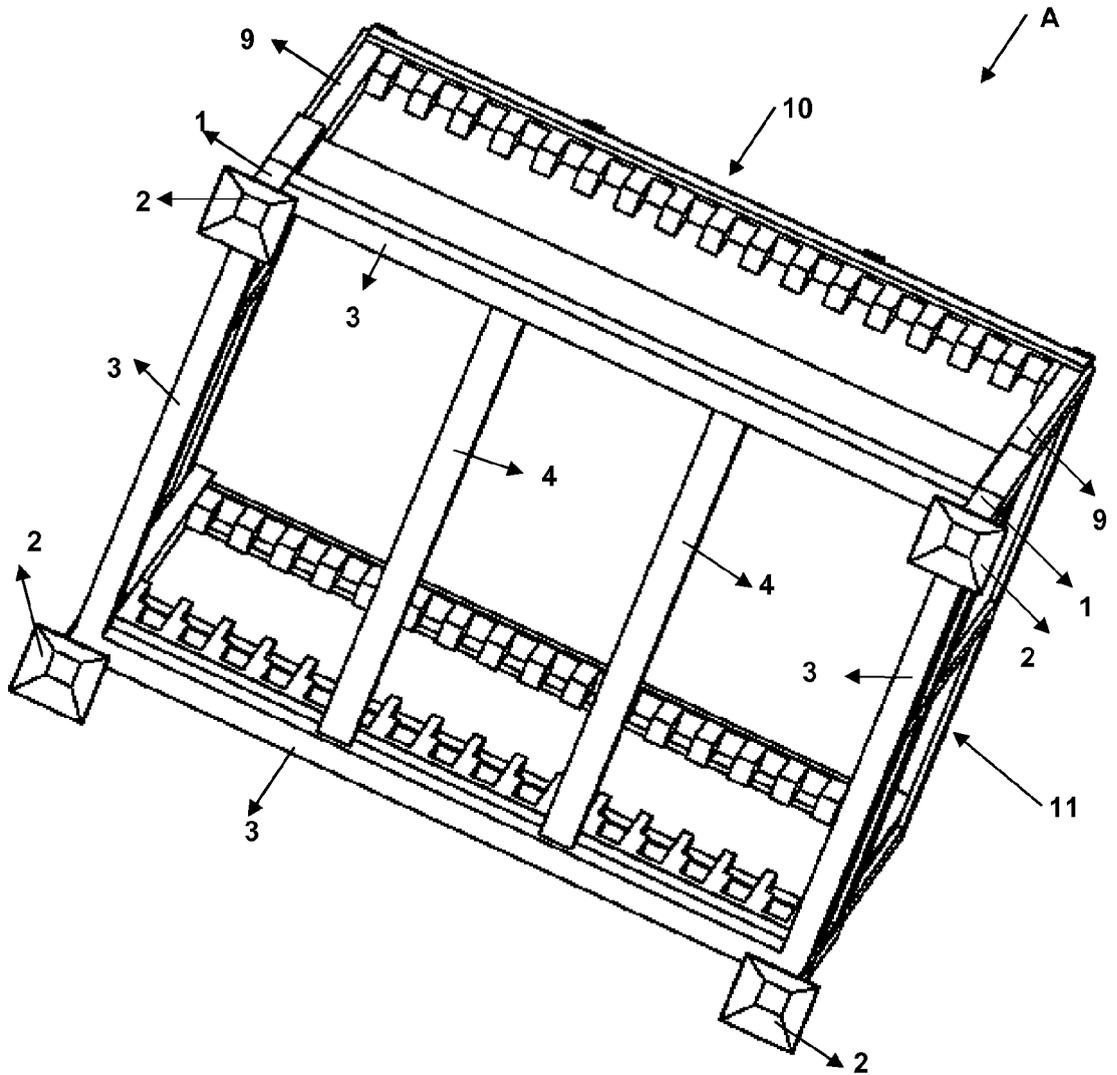


Figure - 2

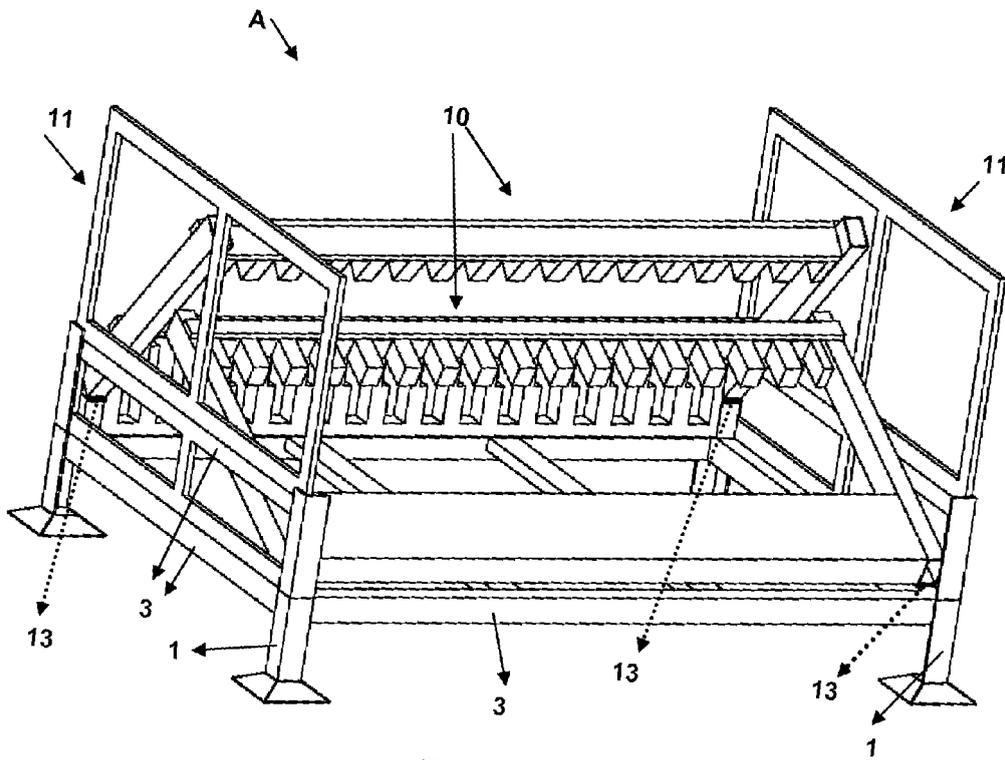


Figure - 3

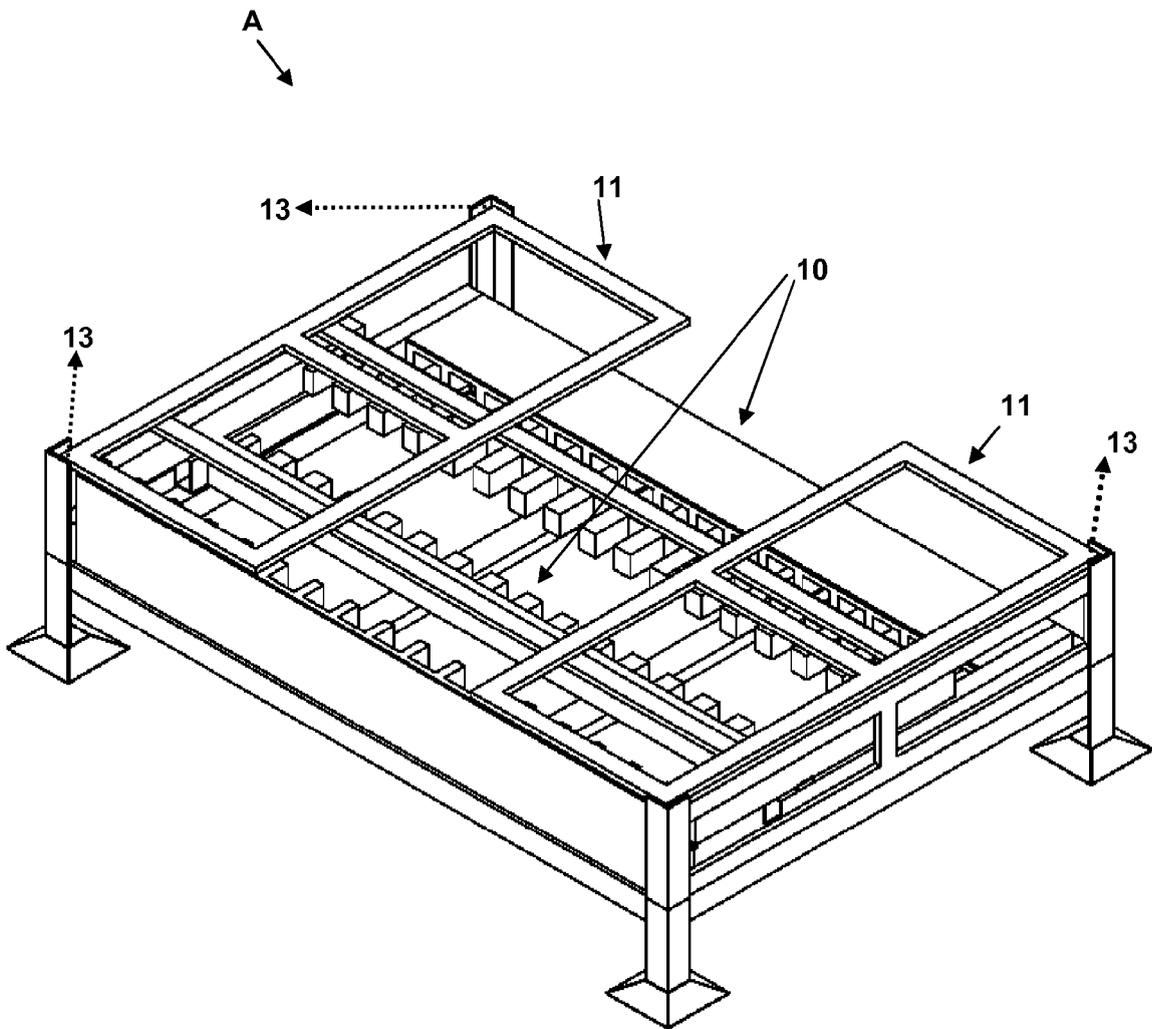


Figure - 4

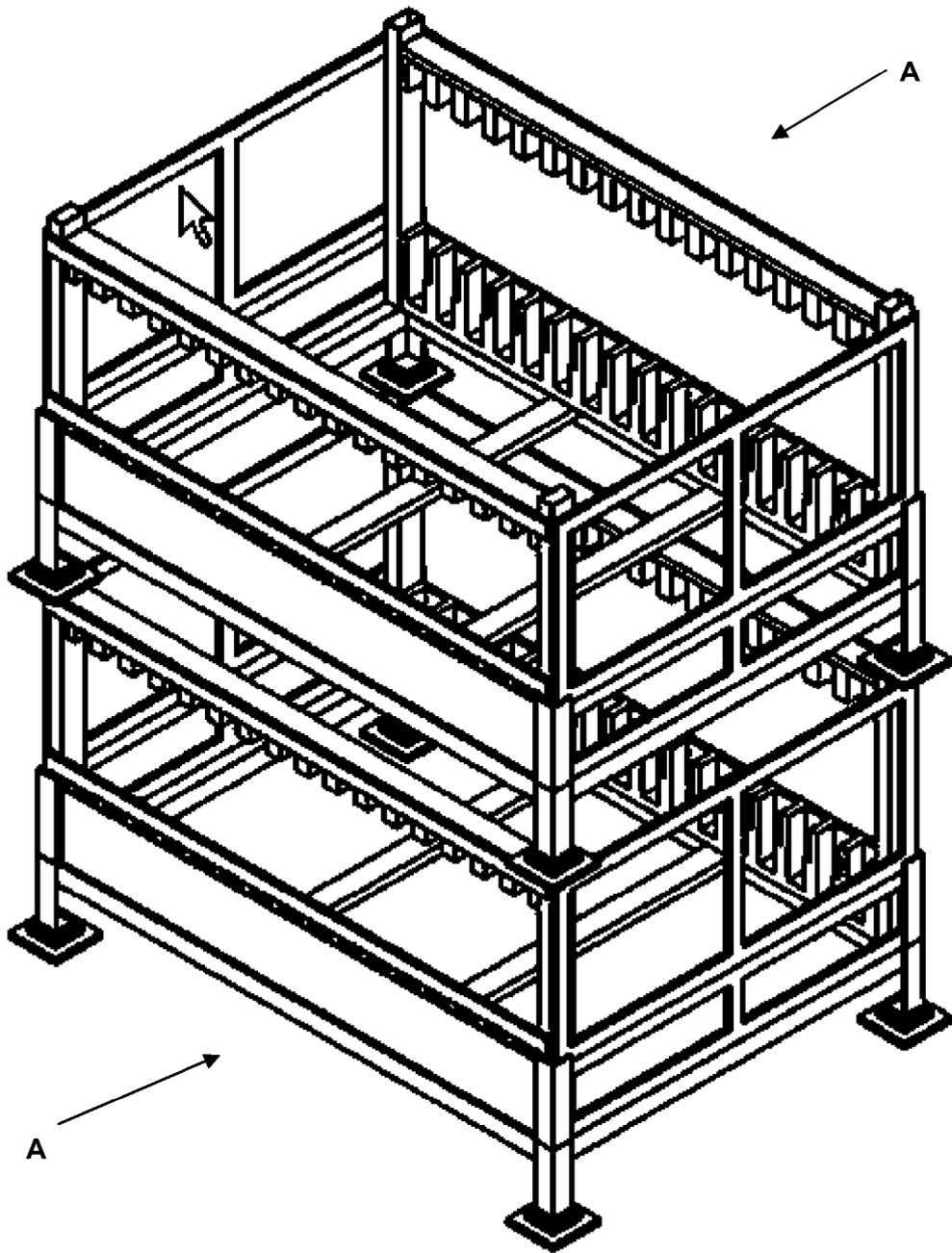


Figure - 5

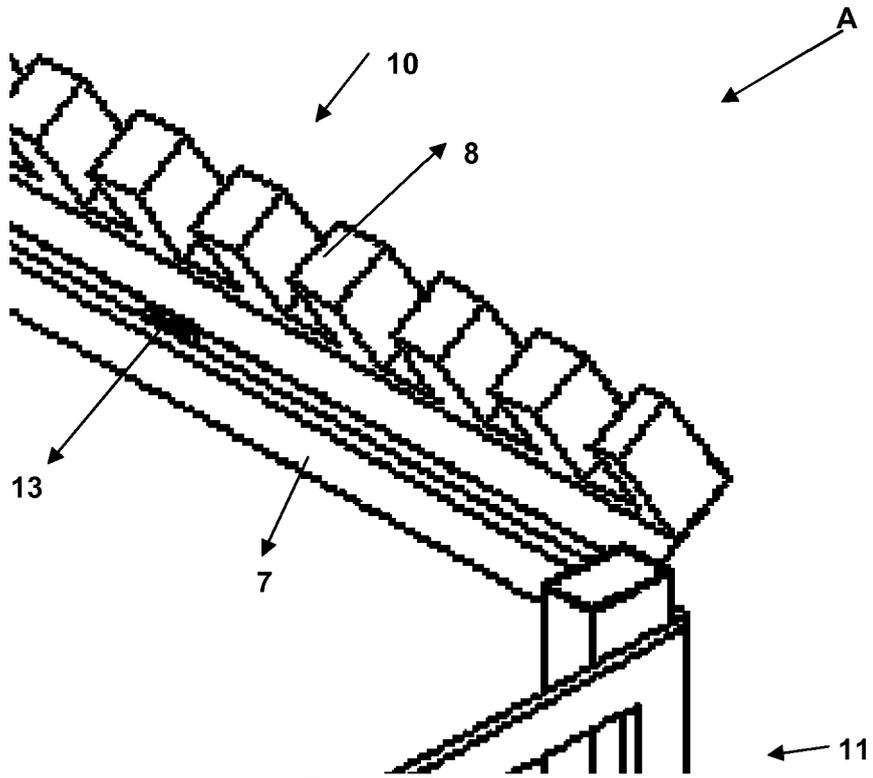


Figure - 6

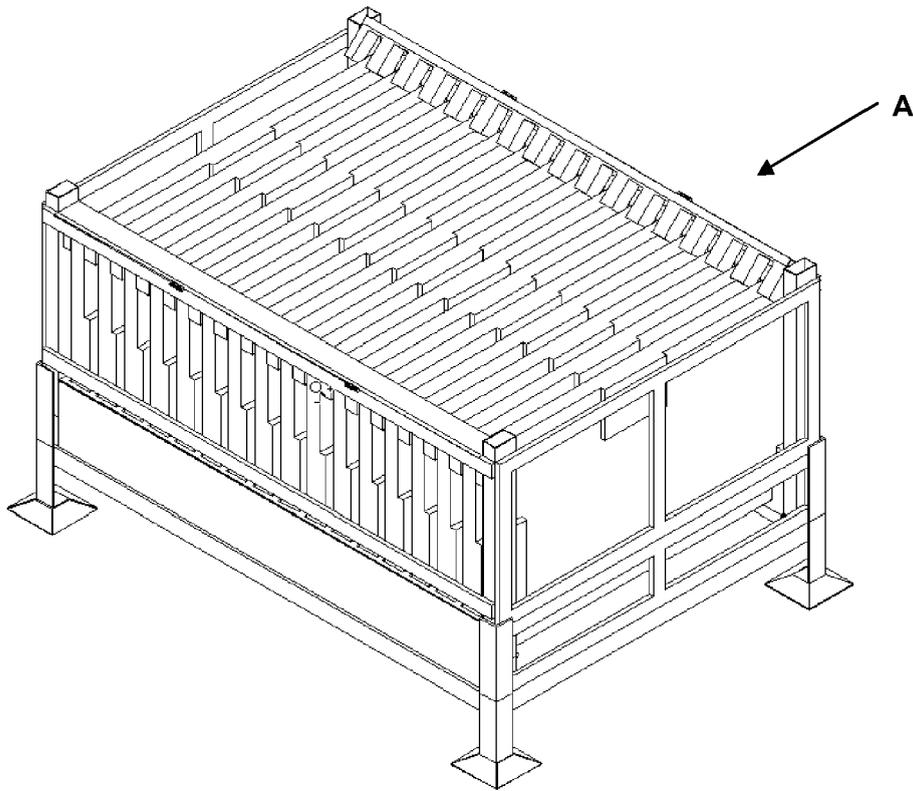


Figure - 7



EUROPEAN SEARCH REPORT

Application Number  
EP 10 16 6702

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			B65D B65G
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 1 September 2010	Examiner Grondin, David
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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EP 10 16 6702

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01-09-2010

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

**REFERENCES CITED IN THE DESCRIPTION**

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