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(54) BOARD STRUCTURE FOR MANUFACTURING CONCRETE PRODUCTS

PLATTENSTRUKTUR ZUM HERSTELLEN VON BETONWAREN

STRUCTURE DE PANNEAU POUR FABRIQUER DES PRODUITS EN BÉTON

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Description

TECHNICAL FIELD

[0001] The present invention relates to a board structure for manufacturing concrete products, and in particular to a board structure for manufacturing concrete products wherein a board used to manufacture a concrete product, for example, concrete blocks, paving stones, etc. is formed of an upper layer and a lower layer, and a side support frame connecting the upper layer and the lower layer, so it does not need to manufacture molds for each size, and a portion that receives external weight during the manufacturing of concrete products can be reinforced, thus obtaining substantial strength and lightness, and the manufacturing does not cost a lot while reducing noises during the manufacturing of concrete products.

BACKGROUND ART

[0002] In general, boards are used during the manufacturing of concrete products, for example, concrete blocks, concrete curb stones, concrete sidewalk blocks, etc. Such boards are necessary products when it needs to continuously product concrete products in large quantities.

[0003] More specifically, the concrete products are manufactured in a state where the boards are disposed integral with the mold during the manufacturing of concrete products. The integrated boards and concrete product are obliged to move through a conveyor to a curing chamber, and the concrete product is cured. The substantially cured concrete product is removed. The boards separated from the concrete product can be used again. The concrete products can be continuously manufactured in large quantities in such a way that the boards circulate again in a concrete product manufacturing machinery system.

[0004] The board, which has the above-mentioned roles, can be made of wood, plastic, a material bonded with hetero materials, for example, wood, plastic, etc., and steel. Since the board made of wood or plastic may be easily impaired in its surface, it is disadvantageous that the service life of such a material may be short.

[0005] In addition, the board made of wood or plastic has a bad property for vibration transfer to the floor, which may make the density of the concrete product uneven. In case of a steel board, a vibration transfer property is good, but it is too heavy, and raw materials cost a lot, which may lead to increased manufacturing cost, so the price of the finished board may increase. The Korean Patent Registration No. 10-1195598 entitled "A board structure for manufacturing concrete products" invented by the same applicant as the present invention includes, as major components, an upper board, a lower board which is secured to the lower surface of the upper board, a space part formed in the insides of the upper board and the lower board, and a reinforcing member which is inserted in the space part.

[0006] It is advantageous that the above-mentioned configuration can make light the entire weight while enhancing structural strength of the board, but it inevitably needs to manufacture the molds for each size of the upper board and the lower board when manufacturing the board due to the intrinsic shapes of the upper board and/or lower board which is formed of an upper layer or lower layer and a bent part, so a lot of initial cost is necessary for manufacturing the boards.

[0007] In addition, a tamping work necessarily entails so as to make more tense the filled stuff of the concrete during the manufacturing of concrete products. In case of the conventional board structure, a lot of noises occurs during the tamping work.

[0008] DE 102 16 668 A1, on which the preamble of claim 1 is based, discloses a board structure for manufacturing concrete products having an upper and a lower layer and a side support frame. Other prior art board structures for manufacturing concrete products are disclosed in DE 195 15 364 A1, US 1.516.760 A, CH 277.909 A, US 4.690.360 A and JP 2005 074900 A.

DISCLOSURE OF THE INVENTION

[0009] Accordingly, the present invention is made to improve the above-mentioned problems. It is an object of the present invention to provide a board structure in accordance with present claim 1 for manufacturing concrete products wherein a board used to manufacture a concrete product is formed of an upper layer and a lower layer, and a side support frame connecting the upper layer and the lower layer, so it does not need to manufacture molds for each size, thus saving manufacturing cost.

[0010] It is another object to provide a board structure for manufacturing concrete products wherein a portion that receives external weight during the manufacturing of concrete products can be reinforced, thus obtaining substantial strength and lightness.

[0011] It is further another object to provide a board structure for manufacturing concrete products wherein acoustic absorbent is filled in a space part formed in the inside of a board, thus reducing the noises which occur during the manufacturing of concrete products.

[0012] It is still further another object to provide a board structure for manufacturing concrete products wherein a vibration member is inserted in a space part formed in the inside of a board, thus enhancing vibration transfer performance during the manufacturing of concrete products.

[0013] To achieve the above objects, there is provided a board structure for manufacturing concrete products, which may include an upper layer and a lower layer which are formed in plane shapes; and a side support frame which is disposed between the upper layer and the lower layer and is secured to the rim portions of the upper layer

and the lower layer.

[0014] To achieve the above objects, there is provided a board structure for manufacturing concrete products, which may include an upper layer which is formed in a plane shape; and a lower body which is formed of a lower layer which is formed in a plane shape; and a side support frame which is bent upward at a rim portion of the lower layer, the lower body being secured to the lower surface of the upper layer.

[0015] In addition, it is characterized in that a vibration member for spreading vibrations which occur during the manufacturing of concrete products is inserted in between the upper layer and the lower layer.

[0016] In addition, it is characterized in that the vibration member is divided into a plurality of parts.

[0017] The vibration member is formed in an I-beam shape which is formed of a horizontal surface and a vertical surface.

[0018] At this time, a bent part is formed at an end portion of each of both sides of the horizontal surface

[0019] A furring bamboo part is formed in a longitudinal direction or upward and downward directions at the vertical surface.

[0020] Meanwhile, it is characterized in that the side support frame is formed in a plate shape.

[0021] In addition, it is characterized in that the side support frame is formed in a quadrangular pipe shape.

[0022] At this time, it is characterized in that the quadrangular pipe-shaped side support frame is formed in a structure with two and more than two folds.

[0023] In addition, it is characterized in that the cross section of the side support frame is formed in a C-shape.

[0024] At this time, it is characterized in that a protrusion-shaped furring bamboo part is formed in a longitudinal direction at the vertical surface of the C-shaped side support frame.

[0025] In addition, the cross section of the side support frame is formed in a H shape.

[0026] In addition, it is characterized in that one or more than one reinforcing members are disposed between the upper layer and the lower layer.

[0027] Furthermore, it is characterized in that a stacking rod for stacking the boards is formed integral at each corner portion of the side support frame.

[0028] In addition, it is characterized in that a leg member is installed at a side portion of the side support frame or at a lower surface of the lower layer.

[0029] At this time, it is characterized in that the leg member is installed detachable by an engaging means.

[0030] In addition, it is characterized in that an acoustic absorbent is filled between the upper layer and the lower layer.

[0031] At this time, it is characterized in that the acoustic absorbent is filled at an edge portion between the upper layer and the lower layer.

[0032] In addition, it is characterized in that the upper layer, the lower layer, the side support frame or the upper layer and the lower body are made of a weather resistance steel plate or a steel plate on the surface of which a corrosion resistance is processed.

[0033] In addition, it is characterized in that the side support frame includes a first side support frame which has an engaging groove at an end portion of each of both sides thereof; and a second side support frame wherein an engaging protrusion inserted into the engaging groove protrudes from an end portion of each of both sides thereof.

ADVANTAGEOUS EFFECTS

[0034] According to the present invention, a board used to manufacture a concrete product is formed of an upper layer and a lower layer, and a side support frame, so it does not need to manufacture molds for each size, thus saving manufacturing cost. A portion that receives external weight during the manufacturing of concrete products can be reinforced, thus obtaining substantial strength and lightness, while saving a lot of manufacturing costs.

[0035] Furthermore, according to the present invention, vibration transfer performance can be enhanced during the manufacturing of concrete products by inserting a vibration member in a space part formed in the inside of the board. Durability can be increased by preventing any sagging phenomenon of the board with the aid of a vibration member and a reinforcing member which are inserted into between the upper layer and the lower layer.

[0036] Acoustic absorbent can be filled in a space part formed in the inside of the board, thus reducing the noises which occur during the manufacturing of concrete products, which results in improved working environment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0037] The present invention will become better understood with reference to the accompanying drawings which are given only by way of illustration and thus are not limitative of the present invention, wherein;

Figure 1 is a separated perspective view illustrating a board structure for manufacturing concrete products;

Figure 2 is a separated perspective view illustrating a side support frame in Figure 1;

Figure 3 is a separated perspective view illustrating a board structure for manufacturing concrete products;

Figure 4 is a partial side cross sectional view illustrating the configuration in Figure 1

Figure 5 is a partial perspective view illustrating a vibration member in Figure 1

Figures 6A, 6B, 6C and 6D are side cross sectional views illustrating various variants of a side support frame in Figure 1;

Figure 7 is a separated perspective view illustrating a board structure for manufacturing concrete products;

Figures 8A, 8B, 8C and 8D are side cross sectional views illustrating various variants of a vibration member of a board structure for manufacturing concrete products

Figures 9A and 9B are partial side cross sectional views illustrating a board structure for manufacturing concrete products, wherein a vibration member in Figure 8 is used

Figure 10 is a perspective view illustrating a board structure for manufacturing concrete products;

Figure 11 is a perspective view illustrating a board structure for manufacturing concrete products;

Figure 12 is a perspective view illustrating a board structure for manufacturing concrete products and

Figures 13A, 13B and 13C are partial cross sectional views illustrating a state where an acoustic absorbent is filled inside a board structure for manufacturing concrete products.

MODES FOR CARRYING OUT THE INVENTION

[0038] The exemplary embodiments of the board structure for manufacturing concrete products will be described with reference to the accompanying drawings.

[0039] Figure 1 is a separated perspective view illustrating a board structure for manufacturing concrete products, Figure 2 is a separated perspective view illustrating a side support frame in Figure 1, Figure 3 is a separated perspective view illustrating a board structure for manufacturing concrete products, Figure 4 is a partial side cross sectional view illustrating the configuration in Figure 1, Figure 5 is a partial perspective view illustrating a vibration member in Figure 1, Figures 6A, 6B, 6C and 6D are side cross sectional views illustrating various variants of a side support frame in Figure 1, Figure 7 is a separated perspective view illustrating a board structure for manufacturing concrete products, Figures 8A, 8B, 8C and 8D are side cross sectional views illustrating various variants of a vibration member of a board structure for manufacturing concrete products, Figures 9A and 9B are partial side cross sectional views illustrating a board structure for manufacturing concrete products, wherein a vibration member in Figure 8 is used, Figure 10 is a perspective view illustrating a board structure for manufacturing concrete products, Figure 11 is a perspective view illustrating a board structure for manufacturing concrete products, Figure 12 is a perspective view illustrating a board structure for manufacturing concrete products, and Figures 13A, 13B and 13C are partial cross sectional views illustrating a state where an acoustic absorbent is filled inside a board structure for manufacturing concrete products.

[0040] The present invention is directed to a board 100 for manufacturing concrete products wherein a board structure used to manufacture a concrete product is formed of an upper layer and a lower layer, and a side support frame connecting the upper layer and the lower layer, so it does not need to manufacture molds for each size, and a portion that receives external weight during the manufacturing of concrete products can be reinforced, thus obtaining substantial strength and lightness, so it is possible to save the cost for manufacturing boards. In addition, noises which occur during the manufacturing of concrete products can be reduced. As illustrated in Figure 1, the board may include an upper layer 110, a lower layer 120 and a side support frame 130 connecting the upper layer 110 and the lower layer 120.

[0041] More specifically, the upper layer 110 is formed in a plane shape on which a concrete product can be manufactured and cured, and the lower layer 120 is formed in a plane shape for maintaining the board 100 horizontal so that the board 100 does not incline during the manufacturing and curing of the concrete product. The side support frame 130 is configured to connect the rim portions between the upper layer 110 and the lower layer 120, while serving to support the entire weight of the concrete product which is being manufactured, transferred and cured on the upper side of the upper layer 110.

[0042] Since the conventional board in general is constructed in a box shape wherein the upper layer, the lower layer and the side support frame are formed integral or the upper layer and the lower layer are separated, so the upper layer or the lower layer is inserted in the inside of the lower layer or the upper layer. For this reason, it needs to separately manufacture molds for each size when manufacturing the board 100 having various sizes. Different from the above conventional board structure, the upper layer 110, the lower layer 120 and the side support frame 130 all belonging to the board 100 are separately provided, so the board 100 can be manufactured through only a sheet metal working (cutting) and a bonding process, for example, a welding process, etc., which can allow to quickly manufacture the boards in various sizes at lower costs.

[0043] At this time, the side support frame 130 may be formed of a pair of first side support frames 132 secured to a rim portion of a horizontal direction (or vertical direction) of the board 100, and a pair of second side support frames 134 secured to a rim portion of a vertical direction (or horizontal direction) of the board 100, wherein the first side support frames 132 and the second side support frames 134 are separate. An engaging groove 132a is formed at an end portion of each of both sides of the first

side support frames 132, and an engaging protrusion 134a intended to be inserted in the engaging groove 132a protrudes from an end portion of each of both sides of the second side support frames 134, so the second side support frames 134 can be inserted into between the first side support frames 132.

[0044] Not illustrated in the drawings, an engaging groove 132a may be additionally formed at an intermediate portion of the first side support frame 132. The second side support frame 134 may be disposed between the upper layer 110 and the lower layer 120 by additionally securing to the thusly formed engaging groove 132a the second side support frame134 at both ends of which the engaging protrusion 134a is formed, thus supporting the upper layer 110.

[0045] In addition, as illustrated in Figure 2, the side support frame 130 may be integrally formed in a C-shape, thus engaging the upper layer 110 and the second layer 120.

[0046] Meanwhile, as illustrated in Figures 6A, 6B, 6C and 6D, the side support frame 130 may have various cross section shapes. First, as illustrated in Figure 6A, the side support frame 130a may be formed in a plate shape with a predetermined thickness and may be engaged between the upper layer 110 and the lower layer 120.

[0047] Next, as illustrated in Figure 6B, the side support frame 130 may be formed in a frame shape with a C-shape cross section. The side support frame 130b with the C-shaped cross section may be engaged between the upper layer 110 and the lower layer 120, wherein the vertical surface 132b faces outward.

[0048] At this time, at least one furring bamboo part 134b may be formed in a longitudinal direction on the vertical surface 132b of the C-shape side support frame 130b. The furring bamboo part 134b is formed in a protruded shape, thus reinforcing the support force of the side support frame 130b.

[0049] Next, as illustrated in Figure 6C, the side surface frame 130c may be formed in a quadrangular pipe shape. At this time, the quadrangular pipe may be formed in a structure with two or more than two folds, thus maximizing the support force of the side support frame 130c.

[0050] As illustrated in Figure 6D, the side support frame 130d may have a H-shaped cross section. In this case, an acoustic absorbent 180 may be filled in a space part formed at the side support frame 130d.

[0051] In addition, the side support frame 130d with a H-shaped cross section may be formed in a structure with more than two or more than two folds or a furring bamboo part may be formed at a vertical portion, thus enhancing supporting force.

[0052] At this time, the side support frame 130d with a H-shaped cross section is secured by a welding method between the upper layer 110 and the lower layer 120. A front side of an outer vertical surface between two vertical surfaces belonging to the side support frame 130d is welded by a welding method, and an inner vertical surface is welded at multiple points at regular intervals by a spot welding method, so the upper layer 110, the lower layer 120 and the side support frame 130d are integrated, thus maximizing the supporting force of the side support frame 130d.

[0053] Meanwhile, in the board 100 for manufacturing concrete products, as illustrated in Figure 3, the board 100 may be formed of an upper layer 110 and a lower body 190. At this time, the lower body 190 is characterized in that the lower layer 120' and the side support frame 130' are formed integrated.

[0054] More specifically, the lower body 190 wherein the lower layer 120' formed in a plane shape by a press drawing method and the side support frame 130' bent upwardly at a rim portion of the lower layer 120' are integrated, is manufactured and secured to the lower surface of the upper layer 110, so it can be possible to manufacture a board 100 in such a way that the welding process, for example, a welding working, etc. is simplified.

[0055] Meanwhile, a vibration member 140 may be inserted between the upper layer 110 and the lower layer 120 (hereinafter, it should be understood that the lower layers 120 and 120' include the lower layer 120' of the lower body 190). Here, the vibration member 140 serves to increase the transfer performance of vibrations which occur during the manufacturing of concrete products, thus producing the concrete products which have uniform density.

[0056] More specifically, the board 100 vibrates integrally with the mold during the manufacturing of concrete products. In case where the board 100 absorbs the vibrations of mold, the density of the concrete product on the board 100 may become uneven, for which fraction defective may increase. For this reason, the vibration member 140 is inserted between the upper layer 110 and the lower layer 120, 120' in order to allow the vibrations of the mold to spread evenly to the concrete product, thus producing concrete products having uniform density.

[0057] At this time, the vibration member 140 is installed in such a way that the upper layer 110 and the lower layer 120, 120' contact with each other with no any gaps between them for the sake of efficient transfer of vibrations.

[0058] Namely, the vibration member 140 aims to uniformly spread the vibrations of the mold which occur during the manufacturing of concrete products, so the negative and position protrusion structure may allow the upper layer 110 and the lower layer 120, 120' to contact with each other evenly, thus minimizing the entire weight of the board 100.

[0059] In addition, as illustrated in Figure 5, a protrusion-shaped first furring bamboo part 146 may be formed in a longitudinal direction at a lower surface of the negative protrusion 142 of the vibration member 140 and at an upper surface of the positive protrusion 144 thereof. Here, the first furring bamboo part 146 serves to enhance the strength in the longitudinal direction of the vibration member 140, thus preventing any deformation of the vi-

bration member 140 and enhancing the transfer force of vibrations.

[0060] In addition, a negative protrusion-shaped second furring bamboo part 148 may b formed in the upward and downward directions at the side surface of the vibration member 140. The second furring bamboo part 148 serves to enhance the strength of the side surface of the vibration member 140, thus preventing any deformation of the vibration member 140, so any sagging phenomenon at the upper layer 110 due to the entire weight of the concrete product can be prevented, while enhancing the transfer force of vibrations.

[0061] In addition, the vibration member 140 may be installed in a form of one piece between the upper layer 110 and the lower layer 120, 120', however it is preferred that such a vibration member 140 may be divided into multiple parts for the sake of the insertion of the reinforcing member 150, while reducing the entire weight of the board 100.

[0062] Meanwhile, according to the present invention, as illustrated in Figures 8C to 8D, an I-beam shaped vibration member 140' is used. It is advantageous that the I-beam shaped vibration member 140' can be easily manufactured.

[0063] More specifically, the I-beam shaped vibration member 140' is formed o a horizontal surface 142' contacting with the lower surface of the upper layer 110 and the upper surface of the lower layer 120, 120', respectively, and a vertical surface 144' connected between the horizontal surfaces 142'. With such a configuration, it is possible to evenly spread the vibrations occurring at the mold during the manufacturing of concrete products to the board 100.

[0064] At this time, the furring bamboo part 144'a is formed in the longitudinal direction or the upward or downward direction at the vertical surface 144', so the strength in the longitudinal direction or upward or downward direction of the vibration member 140' is enhanced, wherein it could say that the vibration member 140' may play a role as a reinforcing member 150 which will be described later.

[0065] In addition, a bent part 142'a which is bent upward in a vertical direction is formed at an end portion of each of both sides of the horizontal surface 142', so to enhance supporting force with respect to the weight in the vertical direction which occurs due to concrete product.

[0066] In addition, part or the whole parts of the horizontal surface 142' or the vertical surface 144' may be formed in a structure with two or more than two folds in the way of bending a steel plate which forms the I-beam shaped vibration member 140' in order to enhance the supporting force and transfer force of the vibrations of the vibration member 140'.

[0067] Next, in the board 100 for manufacturing concrete products, illustrated in Figure 7, the board 100 may further include a reinforcing member 150. The reinforcing member 150 is inserted between the upper layer 110 and the lower layer 120, 120' so as to support the upper layer 110, thus allowing to prevent any sagging phenomenon due to the entire weight of the concrete product during the manufacturing, transfer and curing of the concrete products.

[0068] More specifically, in case where any sagging phenomenon occurs at the board 100, it is may be impossible to manufacture the concrete product in a desired shape, and the transferring performance of vibrations may degrade, which may result in uneven density of the concrete product. For this reason, the reinforcing member 150 is inserted between the upper layer 110 and the lower layer 120, 120' in order to support the lower surface of the upper layer 110, thus enhancing durability by preventing the sagging phenomenon of the board 100.

[0069] At this time, the reinforcing member 150 may be formed in various shapes including a quadrangular pipe shape. It is obvious that the reinforcing member 150 may be formed in a structure with two or more than two folds depending on the size of the concrete product which is indented to be manufactured or the reinforcing member may be inserted between the upper layer 110 and the lower layer 120, 120' in the various variants of the side support frame 130 wherein the furring bamboo part is formed at a side surface.

[0070] In addition, the installation position and number of the reinforcing members 150 may change depending on the size or weight of the concrete product which is intended to be manufactured, and the reinforcing member 150 is mainly installed at a portion contacting with the mold during the manufacturing of the concrete product, thus preventing any deformation of the board.

[0071] Meanwhile, the board 100 for manufacturing concrete products can be adhered by welding the upper layer 110, the lower layer 120, the side support frame 130, the vibration member 140 and the reinforcing member 150 or the upper layer 110, the lower body 190, the vibration member 140 and the reinforcing member 150. At this time, it is preferred that the welding method intended to be used is a mother material-melting type welding method wherein components are adhered without using any medium like a welding rod, so the whole portions of the board 100 can be adhered integral, thus manufacturing the board 100 which is strong and has good transfer performance of vibrations.

[0072] In addition, the materials of the upper layer 110, the lower layer 120, the side support frame 130 and the lower body 190 which all define the outer configuration of the board 100 are weather resistance steel plate. The weather resistance steel plate is a steel plate which has good corrosion resistance as compared with common steel in such a way to add alloy compositions, for example, Cu, Cr, Ni, etc. which in general are not contained in the common steel. Since the weather resistance steel plate does not corrode well in the air, so the service life, namely, durability of the board 100 can be strong.

[0073] In addition, a water resistance agent may be coated on the surface of the weather resistance steel

plate or a corrosion resistance agent may be coated thereon in order to prevent moisture from coming in the inside of the board 100, and any oxidation of the board 100 may be prevented, thus more enhancing the durability of the board 100.

[0074] Next, in the board 100 for manufacturing concrete products, as illustrated in Figure 10, a stacking rod 165 may be formed integral at each corner of the side support frame 130, 130' for the sake of the stacking of the boards 100. At this time, the top of the stacking rod 165 may be tipped, and at the bottom of the stacking rod 165, an insertion groove 165a may be formed to receive the top of the stacking rod 165. With this configuration, it is possible to stack the boards 100 without disposing any other components, for example, an engaging member, etc.

[0075] As not illustrated in the drawings, it is obvious that the stacking rods 165 may be detachably secured to the board by using a predetermined fixing member, for example, a clamp, etc.

[0076] Meanwhile, in the board 100 for manufacturing concrete products, there may be further provided a leg member 170 which is intended to be installed at a side portion of the side support frame 130, 130'. The leg member 170 is provided for the sake of the stacking of the board 100.

[0077] At this time, as illustrated in Figure 11, engaging member 135 and 175 may be formed at the side support frame 130, 130' and the leg member 170, respectively in order to detachably secure the leg member to the side support frame 130, 130' using an engaging member, for example, a bolt, etc.

[0078] In addition, as illustrated in Figure 12, the leg member 170 may be installed at the lower side of the lower layer 120, 120'. In this case, it is obvious that the leg member 170 may be detachably secured with the aid of an engaging member by forming an additional engaging member (not shown) at the lower plate 120, 120' and the leg member 170.

[0079] Meanwhile, the acoustic absorbent 180 may be filled in the space part formed between the upper layer 110 and the lower plate 120, 120'. Here, the absorbent 180 serves to reduce the vibration noises which occur during the manufacturing of concrete products in the molds.

[0080] In other words, since the vibration noises which occur at the board 100 during the manufacturing of concrete product cause problems with working environment, the acoustic absorbent 180 is filled in between the upper layer 10 and the lower layer 120, 120' in an effort to improve such problems, thus reducing the vibration noises which occur at the board 100.

[0081] At this time, it is obvious that the acoustic absorbent 180 can be made of various materials, for example, sawdust, sand, etc. which is lighter than the material of the rubber or synthetic resin (board 100).

[0082] In addition, as illustrated in Figure 13B, the acoustic absorbent may be filled into the whole portions of the space part formed between the upper layer 110 and the lower layer 120, 120' or the acoustic absorbent may be filled into only an edge portion of the board 100 where the vibration noises occur most, as illustrated in Figure 13A, so as to make the board 100 lighter. Alternatively, as illustrated in Figure 13C, the acoustic absorbent 180 may be partially filled into the whole portions of the space part formed between the upper layer 110 and the lower layer 120, 120'.

[0083] Therefore, in the board 100 for manufacturing concrete products, the board 100 may be formed of the upper layer, the lower layer and the side frame, so it does not need to manufacture molds for each size, and a portion that receives weight during the manufacturing of concrete products can be reinforced, thus maintaining strength, and a space part may be formed between the upper layer 110 and the lower layer 120, 120', which can result in lightness, while saving manufacturing cost. The vibration member 140 is inserted in the space part formed within, so the transfer performance of vibrations can be enhanced during the manufacturing of concrete products. The acoustic absorbent 180 may be filled in the space part formed in the inside of the board 100, thus reducing the noises which occur at the board 100 during the manufacturing of concrete products. Therefore, the present invention can provide various advantages.

INDUSTRIAL APPLICABILITY

[0084] The present invention is directed to a board structure for manufacturing concrete products, and in particular to a board structure for manufacturing concrete products wherein a board used to manufacture a concrete product, for example, concrete blocks, paving stones, etc. is formed of an upper layer and a lower layer, and a side support frame connecting the upper layer and the lower layer, so it does not need to manufacture molds for each size, and a portion that receives external weight during the manufacturing of concrete products can be reinforced, thus obtaining substantial strength and lightness, and the manufacturing does not cost a lot while reducing noises during the manufacturing of concrete products.

Claims

1. A board structure (100) for manufacturing concrete products, said structure (100) comprising:

   an upper layer (110) and a lower layer (120) which are formed in plane shapes; and
   a side support frame (130,130a,103b,130c,130d, 130') which is disposed between the upper layer (110) and the lower layer (120, 120') and is secured to the rim portions of the upper layer (110) and the lower layer (120, 120'), wherein a vibration member

(140,140') for spreading vibrations which occur during the manufacturing of concrete products is inserted in between the upper layer (110) and the lower layer (120,120'),
characterized in that the vibration member (140') is formed in an I-beam shape which is formed of a horizontal surface (142'), of which a bent part (142'a) is formed at an end portion of each of both sides, and a vertical surface (144'), and **in that** a furring bamboo part (144'a) is formed in a longitudinal direction or upward and downward directions at the vertical surface (144').

2. The structure of claim 1, **characterized in that** the side support frame (130c) is formed in a quadrangular pipe shape.

3. The structure of claim 1, **characterized in that** the cross section of the side support frame (130b) is formed in a C-shape.

4. The structure of claim 3, **characterized in that** a protrusion-shaped furring bamboo part (134b) is formed in a longitudinal direction at the vertical surface (132b) of the C-shaped side support frame (130b).

5. The structure of claim 1, **characterized in that** the cross section of the side support frame (130d) is formed in a H-shape.

6. The structure of claim 1, **characterized in that** one or more than one reinforcing members (150) are disposed between the upper layer (110) and the lower layer (120,120').

7. The structure of claim 1, **characterized in that** a stacking rod (165) for stacking the boards is formed integral at each corner portion of the side support frame (130,130a,130b,130c,130d,130').

8. The structure of claim 1, **characterized in that** a leg member (170) is installed at a side portion of the side support frame (130,130a,130b,130c,130d,130') or at a lower surface of the lower layer (120,120').

9. The structure of claim 1, **characterized in that** an acoustic absorbent (180) is filled between the upper layer (110) and the lower layer (120,120').

10. The structure of claim 9, **characterized in that** the acoustic absorbent (180) is filled at an edge portion between the upper layer (110) and the lower layer (120,120').

11. The structure of claim 1, **characterized in that** the side support frame (130,130a,130b,130c,130d, 130') includes:

a first side support frame (132) which has an engaging groove (132a) at an end portion of each of both sides thereof; and
a second side support frame (134) wherein an engaging protrusion (134a) inserted into the engaging groove (132a) protrudes from an end portion of each of both sides thereof.

Patentansprüche

1. Plankenstruktur (100) zum Herstellen von Betonerzeugnissen mit:

einer oberen Schicht (110) und einer unteren Schicht (120), die eben ausgebildet sind; und
einem Seitenträgerrahmen (130, 130a, 130b, 130c, 130d, 130'), der zwischen der oberen Schicht (110) und der unteren Schicht (120, 120') angeordnet ist und an Randabschnitten der oberen Schicht (110) und der unteren Schicht (120,120') befestigt ist, wobei ein Vibrationselement (140, 140') zum Verbreiten von Vibrationen, welche während des Herstellens von Betonerzeugnissen entstehen, zwischen der oberen Schicht (110) und der unteren Schicht (120, 120') eingefügt ist;
dadurch gekennzeichnet, dass das Vibrationselement (140') in Form eines I-Trägers ausgebildet ist, welcher aus einer horizontalen Oberfläche (142'), an deren beiden Seitenendabschnitten jeweils ein gebogener Abschnitt (142'a) ausgebildet ist, und einer vertikalen Oberfläche (144') ausgebildet ist, wobei ein geriffelter Abschnitt (144'a) in einer Längsrichtung oder einer Aufwärts- und Abwärtsrichtung an der vertikalen Oberfläche (144') ausgebildet ist.

2. Struktur nach Anspruch 1, **dadurch gekennzeichnet, dass** der Seitenträgerrahmen (130c) in Form einer rechteckigen Röhre ausgebildet ist.

3. Struktur nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Querschnitt des Seitenträgerrahmens (130b) eine C-Form aufweist.

4. Struktur nach Anspruch 3, **dadurch gekennzeichnet, dass** ein mit Vorsprüngen versehener geriffelter Abschnitt (134 b) in einer Längsrichtung an der vertikalen Oberfläche (132b) des C-förmigen Seitenträgerrahmens (130b) ausgebildet ist.

5. Struktur nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Querschnitt des Seitenträgerrahmens (130d) eine H-Form aufweist.

6. Struktur nach Anspruch 1, **dadurch gekennzeichnet, dass** ein oder mehrere Verstärkungselemente (150) zwischen der oberen Schicht (110) und der unteren Schicht (120, 120') angeordnet sind.

7. Struktur nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Stapelstab (165) zum Stapeln der Planken integral an jedem Eckabschnitt des Seitenträgerrahmens (130, 130a, 130b, 130c, 130d, 130') ausgebildet ist.

8. Struktur nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Schenkelelement (170) an einem Seitenabschnitt des Seitenträgerrahmens (130, 130a, 130b, 130c, 130d, 130') oder an einer unteren Oberfläche der unteren Schicht (120, 120') angeordnet ist.

9. Struktur nach Anspruch 1, **dadurch gekennzeichnet, dass** ein akustischer Absorber (180) zwischen der oberen Schicht (110) und der unteren Schicht (120, 120') eingefüllt ist.

10. Struktur nach Anspruch 9, **dadurch gekennzeichnet, dass** der akustische Absorber (180) an einem Kantenabschnitt zwischen der oberen Schicht (110) und der unteren Schicht (120, 120') eingefüllt ist.

11. Struktur nach Anspruch 1, **dadurch gekennzeichnet, dass** der Seitenträgerrahmen (130, 130a, 130b, 130c, 130d, 130') umfasst:

    einen ersten Seitenträgerrahmen (132), welcher eine Eingriffsnut (132a) an einem Endabschnitt jeder seiner beiden Seiten umfasst; und
    einen zweiten Seitenträgerrahmen (134), wobei ein Eingriffsvorsprung (134a), welcher in die Eingriffsnut (132a) eingreift, von einem Endabschnitt jeder seiner beiden Seiten vorkragt.

Revendications

1. Une structure de panneau (100) pour fabriquer des produits en béton, ladite structure (100) comprenant :

    une couche supérieure (110) et une couche inférieure (120) qui sont formées selon des formes planes ; et
    un cadre de support latéral (130, 130a, 103b, 130c, 130d, 130') qui est disposé entre la couche supérieure (110) et la couche inférieure (120, 120') et est fixé aux parties de bordure de la couche supérieure (110) et de la couche inférieure (120, 120'), un élément vibrant (140, 140') destiné à diffuser des vibrations intervenant pendant la fabrication des produits en béton étant inséré entre la couche supérieure (110) et la couche inférieure (120, 120'),
    caractérisée en ce que l'élément vibrant (140') est formé en forme de poutre en forme de I qui est formée par une surface horizontale (142'), de laquelle est formée une partie pliée (142'a) au niveau d'une partie d'extrémité de chacun de deux côtés, et par une surface verticale (144'), et **en ce que** une partie en bambou (144'a) formant tasseau est formée dans une direction longitudinale ou dans des directions allant vers le haut et vers le bas sur la surface verticale (144').

2. La structure selon la revendication 1, **caractérisée en ce que** le cadre de support latéral (130c) est réalisé selon une forme en tube quadrangulaire.

3. La structure selon la revendication 1, **caractérisée en ce que** la section transversale du cadre de support latéral (130b) est formée selon une forme de C.

4. La structure selon la revendication 3, **caractérisée en ce qu'**une partie en bambou (134b) formant tasseau, en forme de saillie, est formée dans une direction longitudinale au niveau de la surface verticale (132b) du cadre de support latéral (130b) en forme de C.

5. La structure selon la revendication 1, **caractérisée en ce que** la section transversale du cadre de support latéral (130d) est formée selon une forme en H.

6. La structure selon la revendication 1, **caractérisée en ce qu'**un ou plusieurs éléments de renforcement (150) sont disposés entre la couche supérieure (110) et la couche inférieure (120, 120').

7. La structure selon la revendication 1, **caractérisée en ce qu'**une barre d'empilage (165) pour empiler les panneaux est formée d'un seul tenant au niveau de chaque partie de coin du cadre de support latéral (130, 130a, 130b, 130c, 130d, 130').

8. La structure selon la revendication 1, **caractérisée en ce qu'**un élément formant piètement (170) est installé au niveau d'une partie latérale du cadre de support latéral (130, 130a, 130b, 130c, 130d, 130') ou au niveau d'une surface inférieure de la couche inférieure (120, 120').

9. La structure selon la revendication 1, **caractérisée en ce qu'**un absorbant acoustique (180) est rempli entre la couche supérieure (110) et la couche inférieure (120, 120').

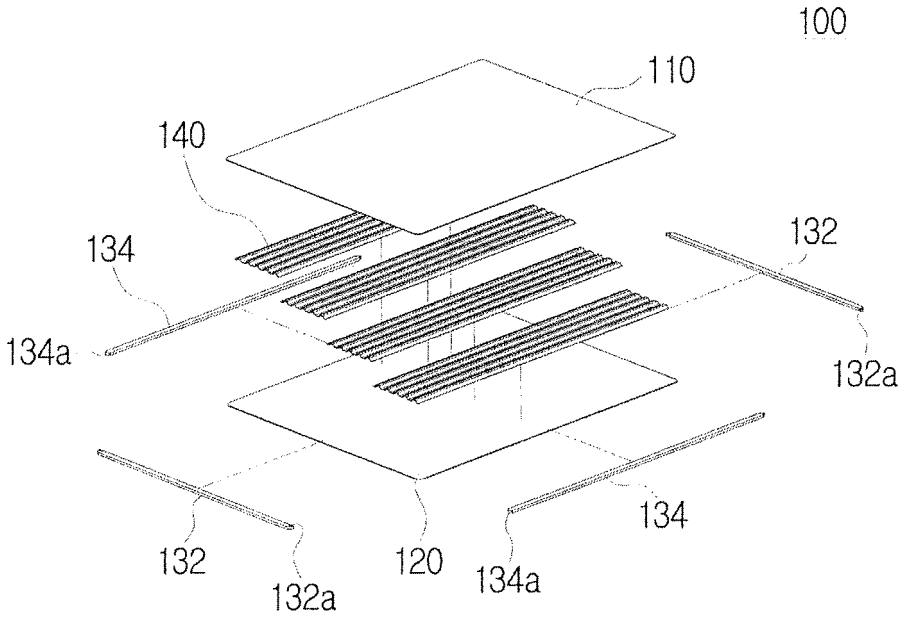
10. La structure selon la revendication 9, **caractérisée en ce que** l'absorbant acoustique (180) est rempli

au niveau d'une partie de bordure entre la couche supérieure (110) et la couche inférieure (120, 120').

11. La structure selon la revendication 1, **caractérisée en ce que** le cadre de support latéral (130, 130a, 130b, 130c, 130d, 130') comprend :

un premier cadre de support latéral (132) qui comporte une rainure d'engagement (132a) au niveau d'une partie d'extrémité de chacun de deux côtés qu'il comprend ; et
un deuxième cadre de support latéral (134) dans lequel une saillie d'engagement (134a) insérée dans la rainure d'engagement (132a) fait saillie d'une partie d'extrémité de chacun de deux côtés qu'il comprend.

Figure 1



[130; 132, 134]

Figure 2

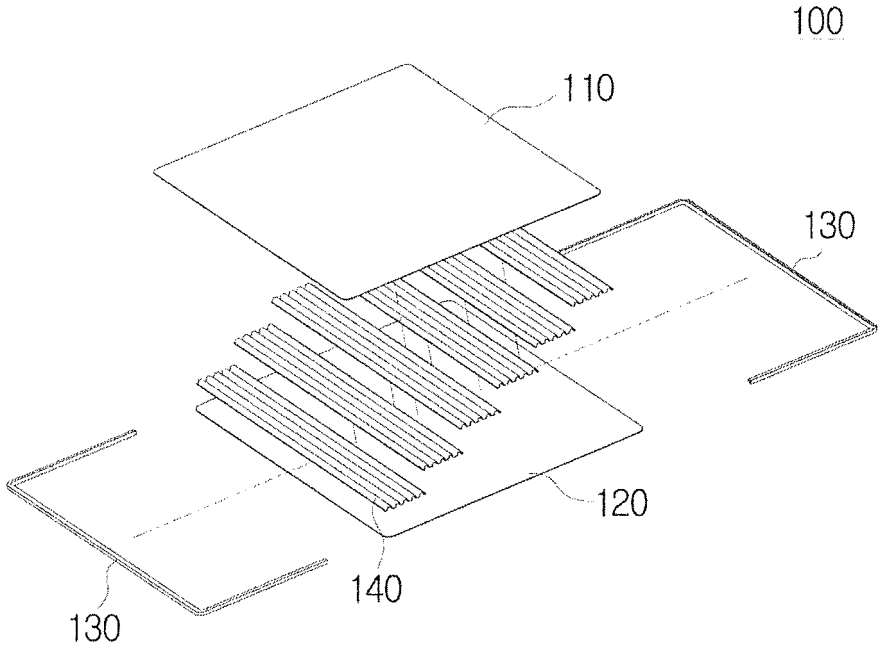


Figure 3

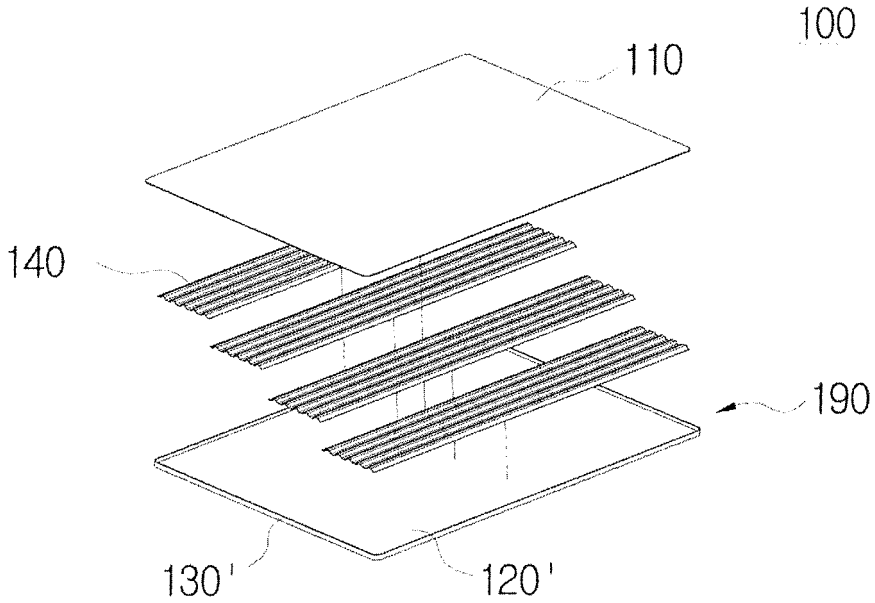


Figure 4

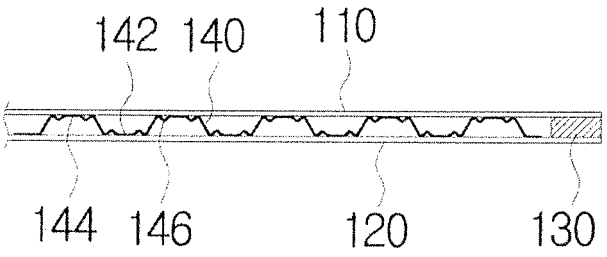


Figure 5

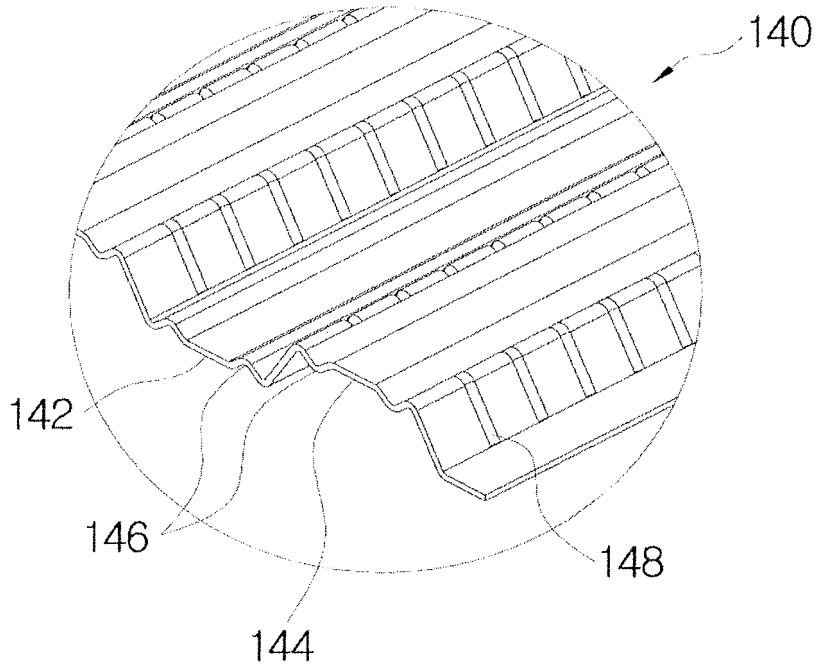


Figure 6A, 6B, 6C, 6D

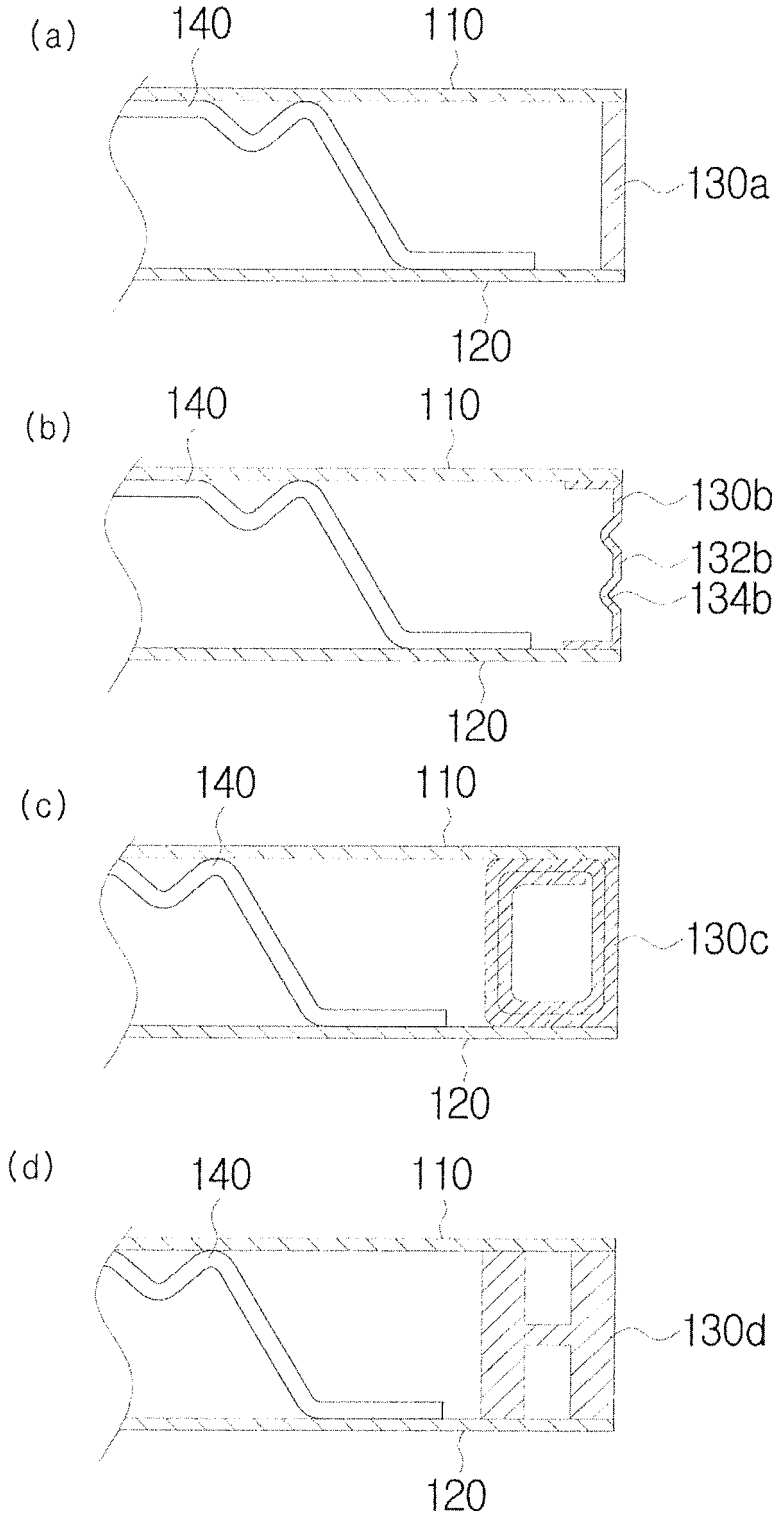


Figure 7

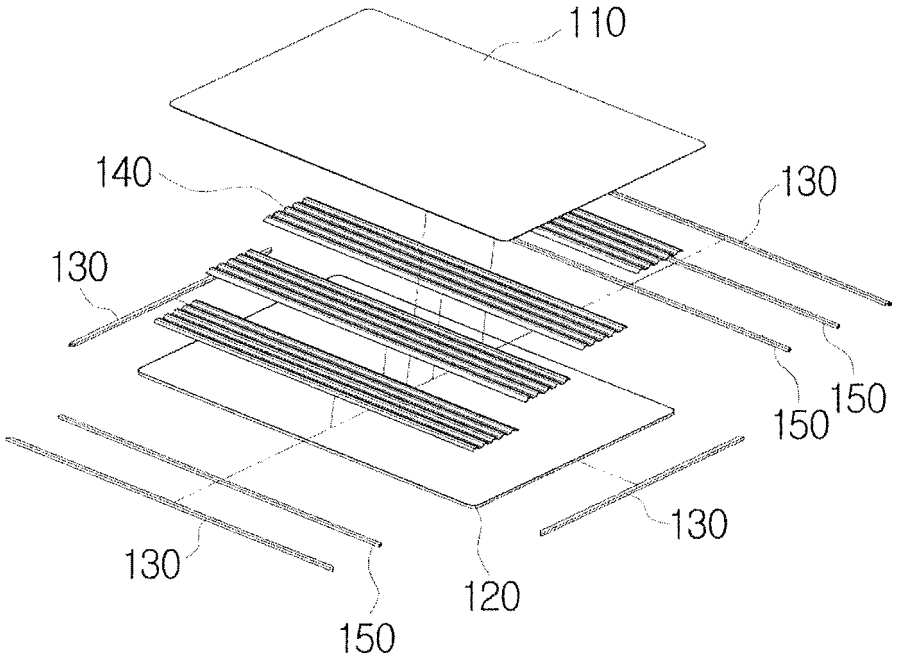


Figure 8A, 8B, 8C, 8D

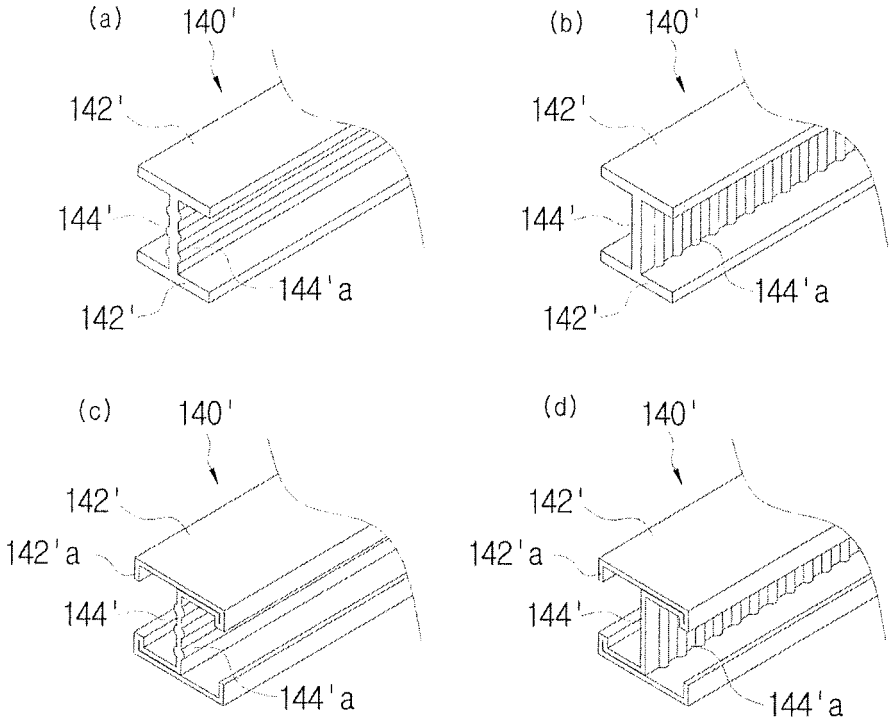


Figure 9A, 9B

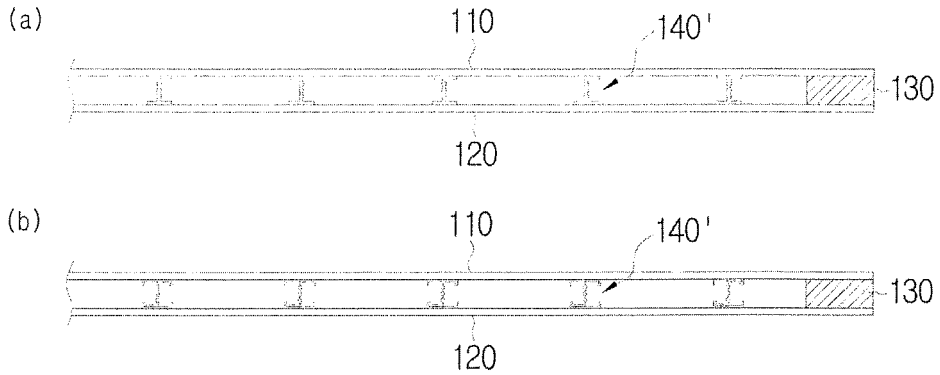


Figure 10

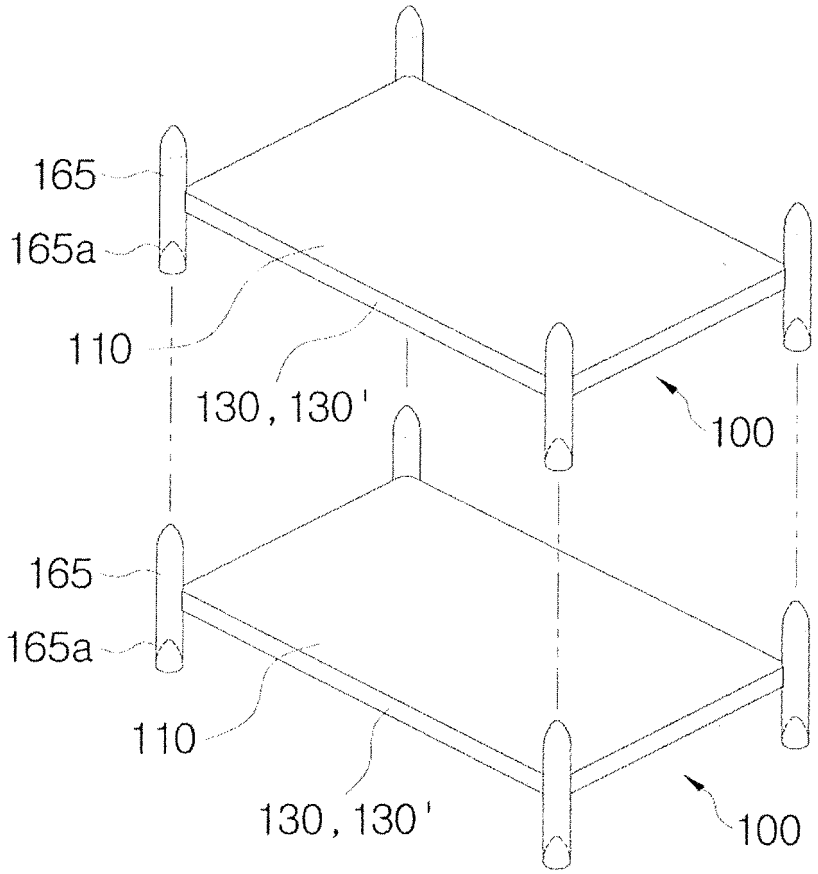


Figure 11

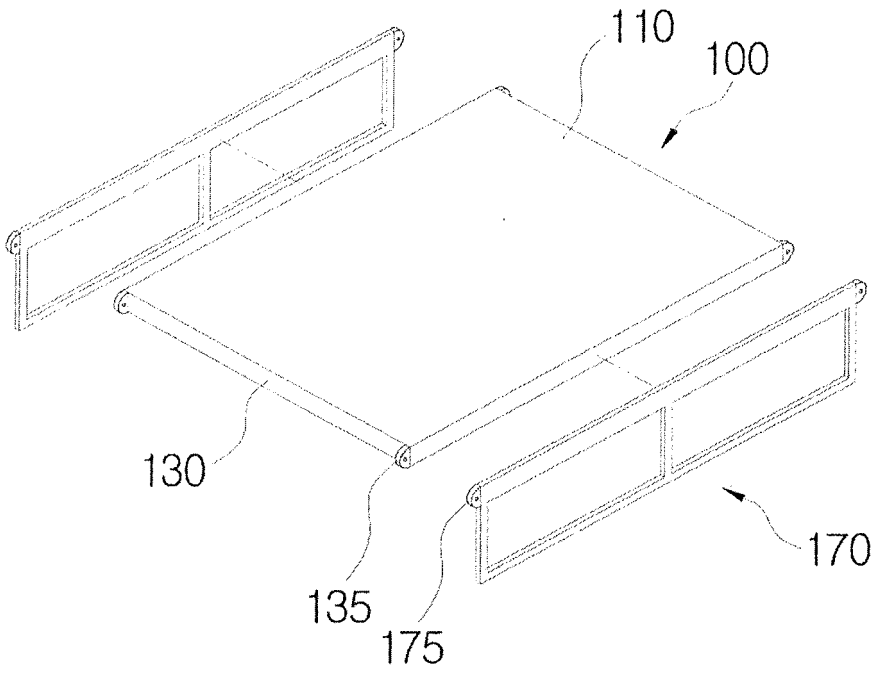


Figure 12

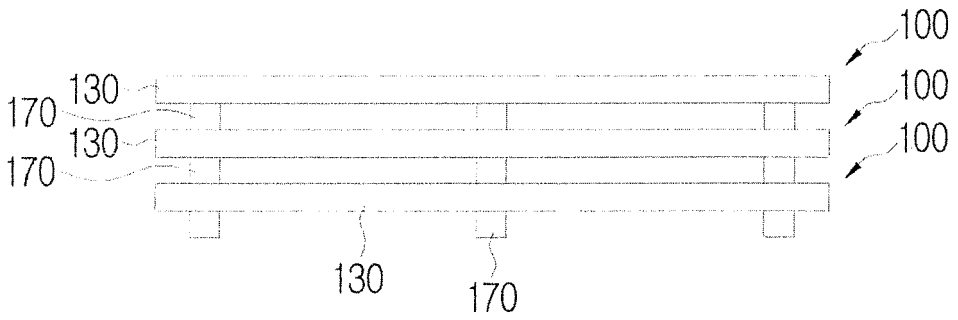
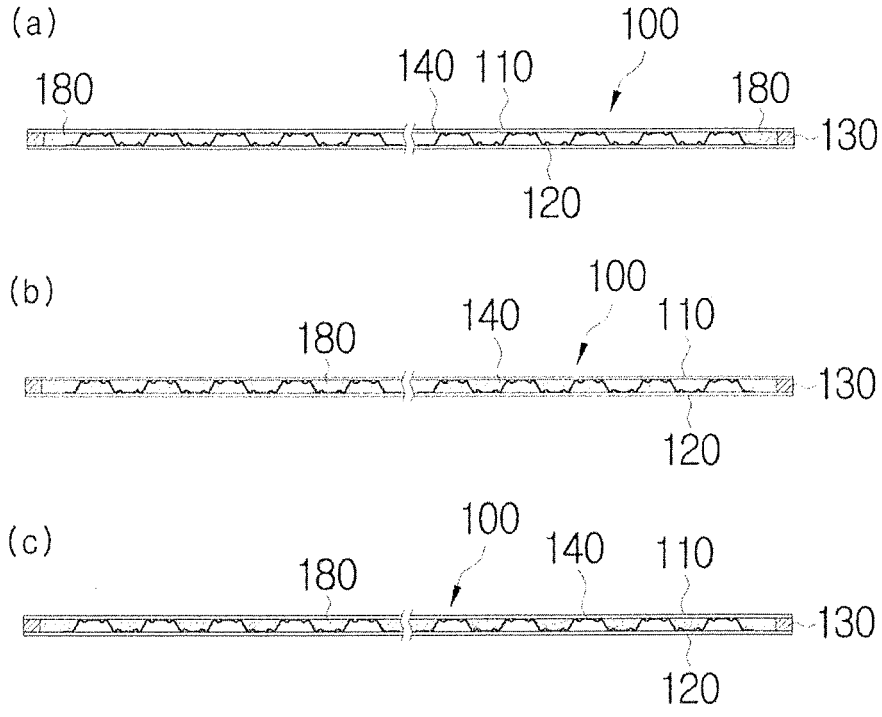


Figure 13A, 13B, 13C



REFERENCES CITED IN THE DESCRIPTION

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