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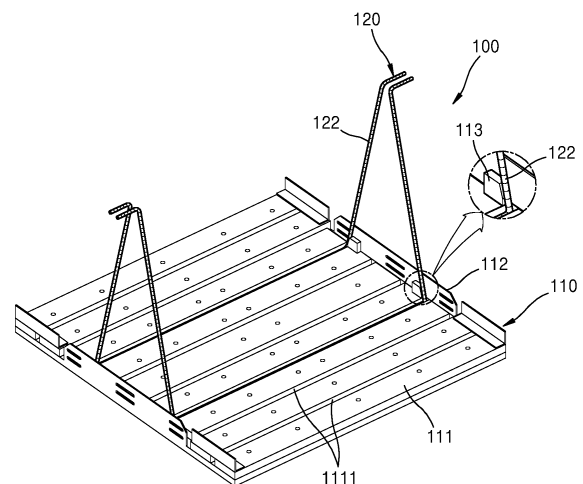
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(54) **REBAR PACKAGING METHOD AND REBAR PACKAGING RECTANGULAR TRAY**

(57) The present disclosure relates to a rebar packaging method and a rebar packaging rectangular tray, and more particularly, a rebar packaging method and a rebar packaging rectangular tray used for the rebar packaging method, the rebar packaging method including: preparing a loading unit including a rectangular tray and a pair of supports detachably provided on the rectangular tray and spaced apart from each other, each of the supports including a center portion seated on an upper surface of the rectangular tray and a side portion bent upward from both ends of the center portion; loading a plurality of rebars across the center portions of the supports which are spaced apart from each other; wrapping sides of the loaded rebars and the supports with vinyl as one unit; and separating the rebars and the supports, which are wrapped with the vinyl, from the rectangular tray.

FIG. 2



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Description

TECHNICAL FIELD

[0001] The present disclosure relates to a rebar packaging method and a rebar packaging rectangular tray, and more particularly, to a rebar packaging method and a rebar packaging rectangular tray which are for easily loading and storing rebars.

BACKGROUND ART

[0002] In general, rebars are mainly used to form the skeletons of structures in construction or industrial sites for the purpose of mechanical strength enhancement.

[0003] Such rebars are manufactured in a bar shape or a roll shape having a predetermined length, and then used after bending the rebars in shapes corresponding to the shapes of corresponding structures in construction sites or processing plants. In addition, when bending a heavy rebar having a weight of 50kg or greater, it is not easy to manually bend the rebar, and thus a rebar banding device is usually used.

[0004] Rebars manufactured using such a banding device are subjected to a process of collecting and packing a plurality of rebars before providing the rebars to customers, and then the packaged rebars are transported to customers.

[0005] The process of loading rebars in a given space and the process of packaging and storing the loaded rebars are mostly performed by manpower, and thus a considerable time is required for loading and packaging rebars.

[0006] As described above, since such loading and packaging processes are generally performed by manpower, the prices of rebars are high when rebars are supplies to customers.

[0007] In recent years, attempts have been made to use automated facilities or the like when storing produced rebars. However, it may be inconvenient to load rebars having various shapes by using automated facilities, and it is difficult to automate all processes for packaging loaded rebars. Thus, such processes are still performed by manpower.

DESCRIPTION OF EMBODIMENTS

TECHNICAL PROBLEM

[0008] The present disclosure is provided to address the above-mentioned problems, and more particularly, the present disclosure relates to a rebar packaging method and a rebar packaging rectangular tray which are for easily loading and storing rebars.

SOLUTION TO PROBLEM

[0009] To solve the above-mentioned problems, a re-

bar packaging method of the present disclosure includes: preparing a loading unit including a rectangular tray and a pair of supports detachably provided on the rectangular tray and spaced apart from each other, each of the pair of supports including a center portion seated on an upper surface of the rectangular tray and a side portion bent upward from both ends of the center portion; loading a plurality of rebars across the center portions of the pair of supports which are spaced apart from each other; wrapping the plurality of loaded rebars and sides of the pair of supports with vinyl as one unit; and separating the plurality of rebars and the pair supports, which are wrapped with the vinyl, from the rectangular tray.

[0010] In the rebar packaging method,

seating grooves extending in one direction may be provided in the rectangular tray such that the center portions of the pair of supports may be inserted and seated in the seating grooves, and cradles may be provided on end portions of the seating grooves, the cradles making contact with the side portions of the pair of supports for supporting and maintaining the pair of supports in a standing position.

[0011] In the rebar packaging method, the pair of supports may be stood on the rectangular tray in an inclined state in which spacing between the pair of supports decreases in a direction toward upper ends of the side portions with the center portions being spaced apart from each other.

[0012] In the rebar packaging method, the plurality of rebars may be stacked up in a state in which the rebars are spaced apart from each other side by side in a horizontal direction.

[0013] In the rebar packaging method, the plurality of rebars may be previously bent in a "U" shape and may be spaced apart from each other side by side in a horizontal direction in an overlapping manner.

[0014] In the rebar packaging method, the plurality of rebars may include bent feet which are bent inward from a "U" shape, and the plurality of rebars may be arranged in an overlapping manner in which each rebar is spaced apart from adjacent rebars such that the bent feet may be not in contact with each other.

[0015] To achieve the above-mentioned objectives, a rebar packaging rectangular tray of the present disclosure is provided to receive supports for loading rebars thereon, the rebar packaging rectangular tray including:

a body portion having a rectangular shape with front, rear, front, rear sides, the body portion including seating grooves in an upper surface thereof, the seating grooves extending in one direction and arranged apart from each other in parallel with the front and rear sides;

side wall plates arranged on the front and rear sides

of the body portion and protruding upward from the body portion; and

cradles provided on the side wall plates for supporting portions of the supports seated in the seating grooves such that the supports may be maintained in the seating grooves in a standing position.

[0016] In the rebar packaging rectangular tray, the cradles may include a plurality of cradles arranged adjacent to the seating grooves.

ADVANTAGEOUS EFFECTS OF DISCLOSURE

[0017] According to the rebar packaging method of the present disclosure, supports are mounted on a rectangular tray, and rebars are loaded on the supports and packaged by wrapping the rebars with vinyl. Therefore, the whole processes for loading and storing rebars may be simply performed.

BRIEF DESCRIPTION OF DRAWINGS

[0018]

FIG. 1 is view illustrating a state in which supports are mounted on a rectangular tray for packaging rebars, according to the present disclosure.

FIG. 2 is a view illustrating a state in which the supports shown in FIG. 1 are mounted on the rectangular tray for packaging rebars.

FIG. 3 is a view illustrating a state in which some rebars are arranged on the rectangular tray shown in FIG. 2.

FIG. 4 is a view illustrating a state in which rebars are completely stacked and loaded inside the supports shown in FIG. 3.

FIG. 5 is a view illustrating a state in which the rebars and the supports are wrapped with vinyl after the rebars are completely loaded.

FIG. 6 is a view illustrating a state in which the rebars wrapped with vinyl are separated from the rectangular tray.

FIGS. 7A to 8D are views illustrating examples of rebars arranged on the rectangular tray.

MODE OF DISCLOSURE

[0019] Hereinafter, a rebar packaging method will be described in detail with reference to the accompanying drawings.

[0020] The rebar packaging method of the present disclosure includes an operation of preparing a loading unit 100, an operation of loading rebars, an operation of wrapping with vinyl, and a separating operation.

[0021] The operation of preparing the loading unit 100 is for preparing the loading unit 100 which includes supports 120.

[0022] Specifically, the loading unit 100 includes a rectangular tray 110 for loading rebars thereon and the supports 120.

[0023] The rectangular tray 110 for loading rebars thereon includes a body portion 111, side wall plates 112, and cradles 113.

[0024] The body portion 111 is shaped like a rectangular flat plate having a pair of left and right sides and a pair of front and rear sides. A plurality of seating grooves 1111 extending in one direction are arranged on an upper surface of the body portion 111. In this case, the seating grooves 1111 are apart from each other at regular intervals and extend in a direction parallel with the front and rear sides. The seating grooves 1111 are apart from each other in a front-to-rear direction.

[0025] The cross-section of each of the seating grooves 1111 is slightly larger than the cross-section of each of the supports 120 such that the supports 120 may be sufficiently inserted in the seating grooves 1111. The positions of the supports 120 may be fixed as the supports 120 are inserted into the seating grooves 1111 and stably seated in the seating grooves 1111.

[0026] The side wall plates 112 are arranged and stood up along the left and right sides of the body portion 111. Specifically, the side wall plates 112 are configured to protrude upward from the body portion 111 in a state in which the side wall plates 112 are arranged on the left and right sides of the body portion 111.

[0027] The side wall plates 112 has a function of preventing the supports 120 inserted in the seating grooves 1111 from being moved to the left and right away from the seating grooves 1111.

[0028] The cradles 113 are provided on the side wall plates 112 to support the supports 120 seated in the seating grooves 1111 such that the supports 120 may be maintained in the seating grooves 1111 in a standing position. Specifically, the cradles 113 have an approximately rectangular parallelepiped shape to perform a function of supporting the supports 120 while maintaining the supports 120 in an inclined state. The supports 120 have inclined surfaces such that the supports 113 may be maintained in an inclined state with the inclined surfaces in contact with the cradles 113. The cradles 113 may be arranged adjacent to the seating grooves 1111 to support the supports 120 seated in the seating grooves 1111.

[0029] The supports 120 include: center portions 121 configured to be seated in the seating grooves 1111 of the rectangular tray 110; and side portions 122 that are bent at ends of the center portions 121 and extend upward. Upper ends of the side portions 122 are bent outward. The supports 120 include a metallic material and may preferably include a material having relatively high rigidity.

[0030] The supports 120 are provided as a pair, and the pair of supports 120 are seated on the rectangular tray 110. Specifically, the supports 120 are inserted into the seating grooves 1111 in a state in which the center

portions 121 are spaced apart from each other, and are stood on the rectangular tray 110 in an inclined state in which the spacing between the supports 120 decreases in a direction toward upper ends of the side portions 122. In this case, the side portions 122 of the supports 120 are in contact with the inclined surfaces of the cradles 113 such that the inclined state of the supports 120 may be maintained. The upper ends of the side portions 122 of the supports 120 may be bound together using a binding material (e.g., an iron strap) to maintain the state in which the supports 120 are seated on the rectangular tray 110.

[0031] In the operation of loading the rebars 200, the rebars 200 are loaded in such a manner that the rebars 200 cross the center portions 121 of the supports 120 which are spaced apart from each other. That is, the rebars 200 are loaded on upper portions of the supports 120 seated in the seating grooves 1111. In the present embodiment, the rebars 200 are previously bent in a "U" shape, and center portions 121 of the rebars 200 may be placed on the supports 120 which are provided as a pair. In addition, the rebars 200 are arranged in such a manner that the rebars 200 are spaced apart from each other side by side in a horizontal direction. Specifically, as shown in FIG. 3, in the lowermost layer of rebars 200, the rebars 200 are spaced apart at predetermined intervals in an overlapping manner. In this case, the rebars 200 having a "U" shape are arranged symmetrically and alternately such that a portion of one rebar 200 may be placed inside another rebar 200 to increase the number of rebars 200 arranged in a narrow space.

[0032] The loading of the rebars 200 may be performed by an automated facility. That is, after bending the rebars 200 in a "U" shape using a bending machine, a robot (not shown) may pick up the rebars 200 that has been manufactured using the bending machine and may place the rebars 200 at a designated position. Transfer of the rebars 200 by the robot is performed according to preset values that are previously input. In this case, the rebars 200 are arranged in the same manner as the lowermost layer of rebars 200 shown in FIG. 3 and are stacked up on the lowermost layer such that a large number of rebars 200 may be stacked up as shown in FIG. 4.

[0033] Specifically, upon receiving information about the lengths of rebars according to the shapes of the rebars, a robot system automatically analyzes loading patterns, selects an appropriate arrangement pattern according to the analysis, and loads the rebars on the rectangular tray 110 in an optimal arrangement.

[0034] In the operation of wrapping with vinyl, the rebars 200 and the supports 120 are wrapped with vinyl 300 as one unit. Specifically, after the rebars 200 are stacked in a predetermined arrangement inside the supports 120, the rebars 200 and sides of the supports 120 are wrapped with the vinyl 300 to fix the rebars 200 to the inside of the supports 120. As a specific method of wrapping with the vinyl 300, a separate wrapping machine (not shown) may be used. That is, while the wrap-

ping machine rotates around the rebars 200 and the supports 120, the wrapping machine may wrap the rebars 200 and the supports 120 with the vinyl 300 as one unit as shown in FIG. 5.

[0035] The separating operation is for separating the rebars 200 and the rebars 200, which are bound together as one use by using the vinyl 300, from the rectangular tray 110. Specifically, as shown in FIG. 6, the supports 120 seated in the seating grooves 1111 are moved upward to separate the supports 120 from the seating grooves 1111. At this time, the rebars 200 are separated from the rectangular tray 110 together with the supports 120 in a state in which the rebars 200 are supported on the center portions 121 of the supports 120 and the sides of the rebars 200 are wrapped with the vinyl 300. After the separating operation, the rebars 200 and the supports 120 may be moved to a storage location or delivered to a customer requiring the rebars 200.

[0036] In addition, a label attaching operation in which a label (not shown) describing information such as specifications or dimensions of the rebars 200 is attached to the vinyl 300 may be performed before the separating operation. However, instead of performing the label attaching operation before the separating operation, the label attaching operation may be performed after the separating operation.

[0037] According to the rebar packaging method of the present disclosure, it is possible to easily load various rebars 200 and then packaging the rebars 200, and thus the time required for loading and packaging may be reduced.

[0038] In addition, since rebar loading and packaging may be performed using an automated facility, time and efforts may be minimized compared with manual work.

[0039] In addition, various types of rebars 200 may be maximally loaded in a narrow area, and thus a space necessary for loading rebars 200 may be reduced.

[0040] In addition, since additional boxes or containers are not needed for loading and storing rebars 200, costs for transportation or the like may be effectively reduced.

[0041] In the above-described embodiment, an example in which rebars 200 are arranged in the rectangular tray 110 is illustrated, but this is a non-limiting example. That is, as shown in FIGS. 7A to 8D, rebars 200 may be arranged in various forms.

[0042] Specifically, as shown in FIGS. 7A to 7D, ten, eight, seven, or six rebars 200 may be horizontally arranged on the rectangular tray 110. In this case, the rebars 200 having a "U" shape may be arranged in a zigzag form according to the size of the rebars 200 such that the rebars 200 may be arranged side by side at slight intervals for dense arrangement in a given space.

[0043] In addition, as shown in FIGS. 8A to 8D, it is also possible to horizontally arrange five, four, three, or two rebars 200 in various forms. In particular, in FIGS. 8C and 8D, bent feet 200a which are bent inward are provided on ends of the rebars 200, and the rebars 200 are arranged in an overlapping manner in which each

rebar 200 is spaced apart from adjacent rebars 200 such that the bent feet 200a are not in contact with each other.

[0044] In addition, the shapes of rebars are not limited to the shapes described above, and examples of rebars include a rebar 201 having a stirrup shape as shown in FIG. 9A, a rebar 202 having a cap bar shape as shown in FIG. 9B, and rebars 203 and 204 having a hoop shape as shown in FIGS.

[0045] In addition, the shapes and arrangements of rebars are not limited to those described above, and design changes for various shapes and arrangements are also possible.

[0046] While embodiments have been described with reference to the accompanying drawings, these embodiments are for illustrative purposes only, and it will be understood by those of ordinary skill in the art that various changes and other equivalent embodiments may be made therefrom. Therefore, the scope and spirit of the present disclosure should be defined by the following claims.

Claims

1. A rebar packaging method comprising:

preparing a loading unit comprising a rectangular tray and a pair of supports detachably provided on the rectangular tray and spaced apart from each other, each of the pair of supports comprising a center portion seated on an upper surface of the rectangular tray and a side portion bent upward from both ends of the center portion;
loading a plurality of rebars across the center portions of the pair of supports which are spaced apart from each other;
wrapping the plurality of loaded rebars and sides of the pair of supports with vinyl as one unit; and separating the plurality of rebars and the pair supports, which are wrapped with the vinyl, from the rectangular tray.

2. The rebar packaging method of claim 1, wherein seating grooves extending in one direction are provided in the rectangular tray such that the center portions of the pair of supports are inserted and seated in the seating grooves, and cradles are provided on end portions of the seating grooves, the cradles making contact with the side portions of the pair of supports for supporting and maintaining the pair of supports in a standing position.

3. The rebar packaging method of claim 2, wherein the pair of supports are stood on the rectangular tray in an inclined state in which spacing between the pair of supports decreases in a direction toward up-

per ends of the side portions with the center portions being spaced apart from each other.

4. The rebar packaging method of claim 1, wherein the plurality of rebars having a "U" shape and are spaced apart from each other side by side in a horizontal direction in an overlapping manner.

5. The rebar packaging method of claim 1, wherein the plurality of rebars comprise bent feet which are bent inward from a "U" shape, and the plurality of rebars are arranged in an overlapping manner in which each rebar is spaced apart from adjacent rebars such that the bent feet are not in contact with each other.

6. A rebar packaging rectangular tray provided to receive supports for loading rebars thereon, the rebar packaging rectangular tray comprising:

a body portion having a rectangular shape with front, rear, left, and right sides, the body portion comprising seating grooves in an upper surface thereof, the seating grooves extending in one direction and arranged apart from each other in parallel with the front and rear sides;
side wall plates arranged on the left and right sides of the body portion and protruding upward from the body portion; and
cradles provided on the side wall plates for supporting portions of the supports seated in the seating grooves such that the supports are maintained in the seating grooves in a standing position.

7. The rebar packaging rectangular tray of claim 6, wherein the cradles comprise a plurality of cradles arranged adjacent to the seating grooves.

8. The rebar packaging rectangular tray of claim 6, wherein the cradles comprise inclined surfaces which make contact with the supports placed in the seating grooves such that the supports are stood in an inclined state.

9. The rebar packaging rectangular tray of claim 8, wherein the supports are provided as a pair and are stood in contact with the cradles in an inclined state in which the supports approach each other in a direction toward upper ends of the supports.

FIG. 1

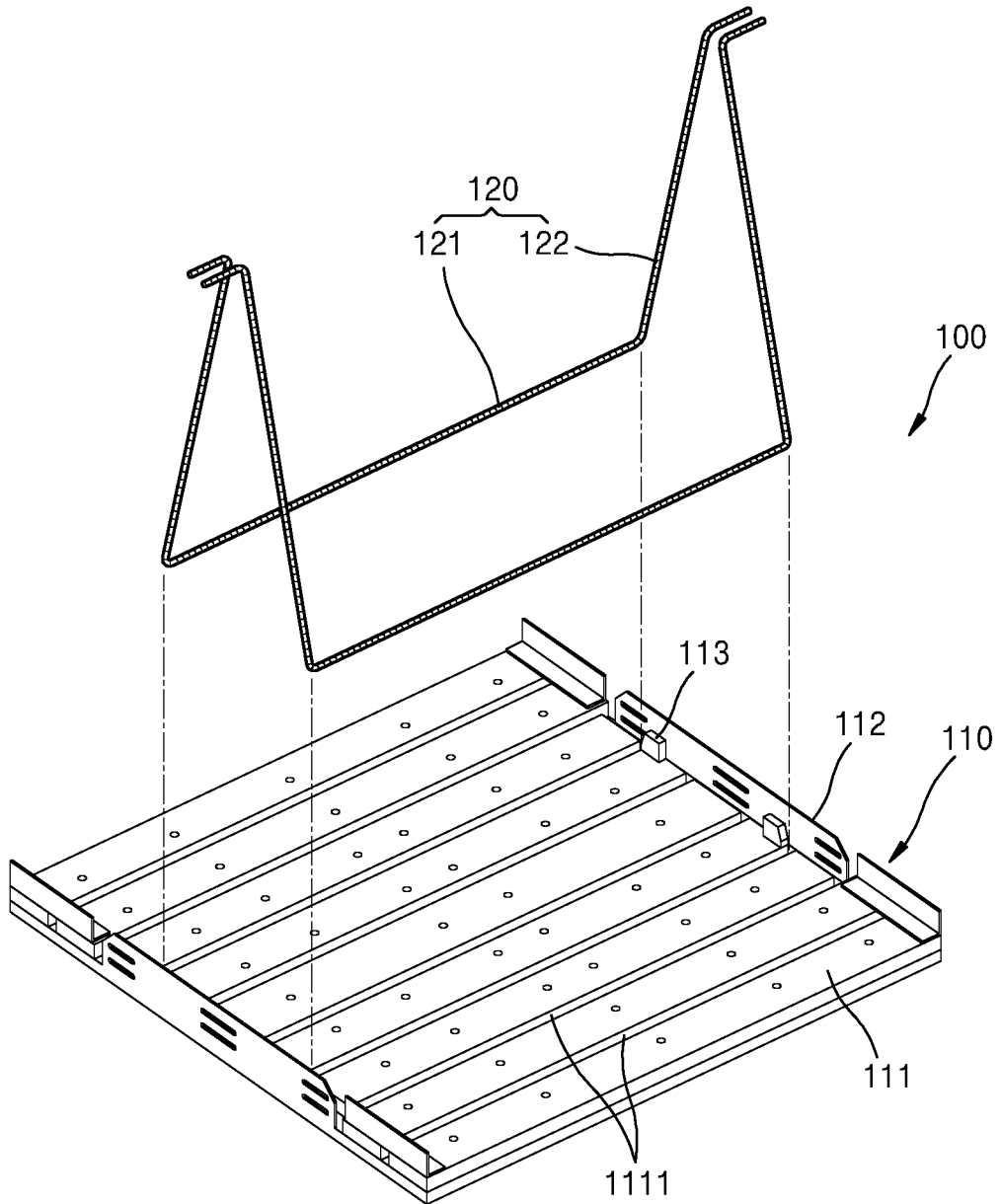


FIG. 2

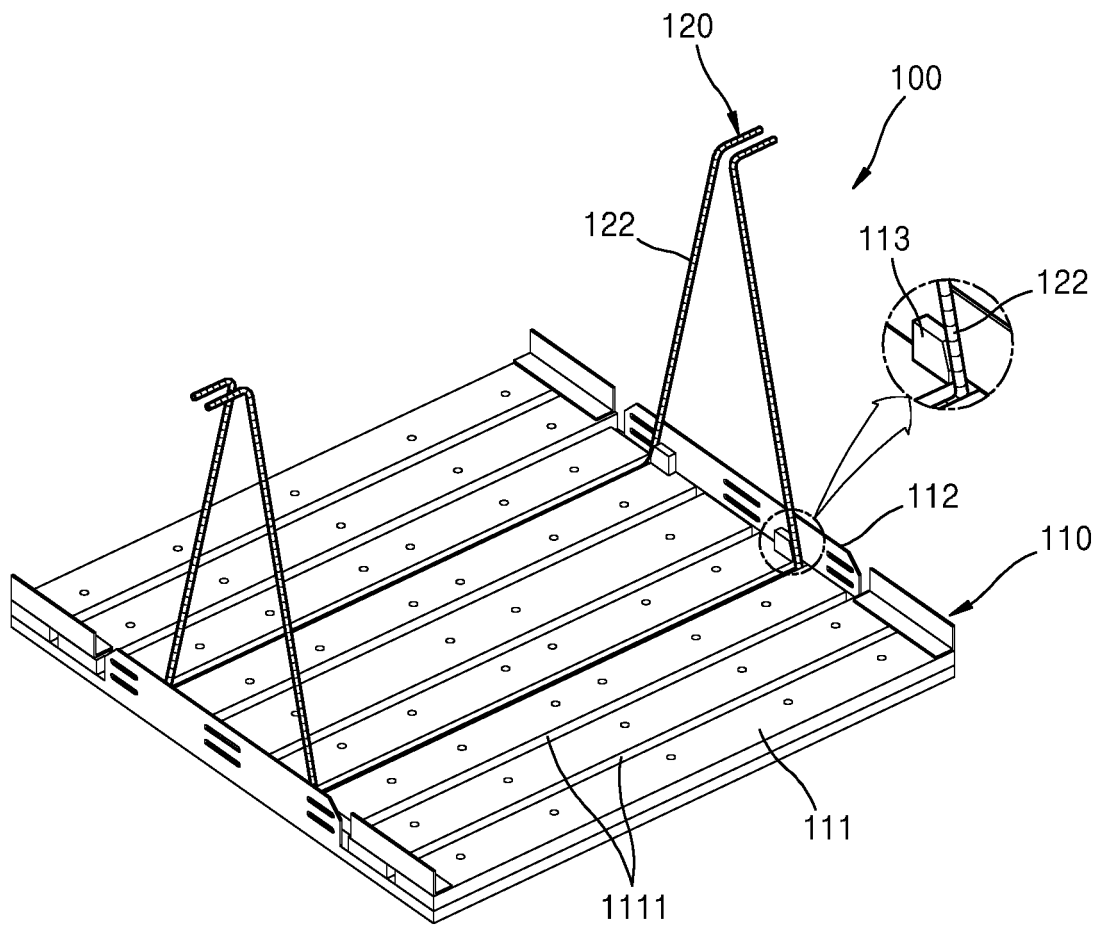


FIG. 3

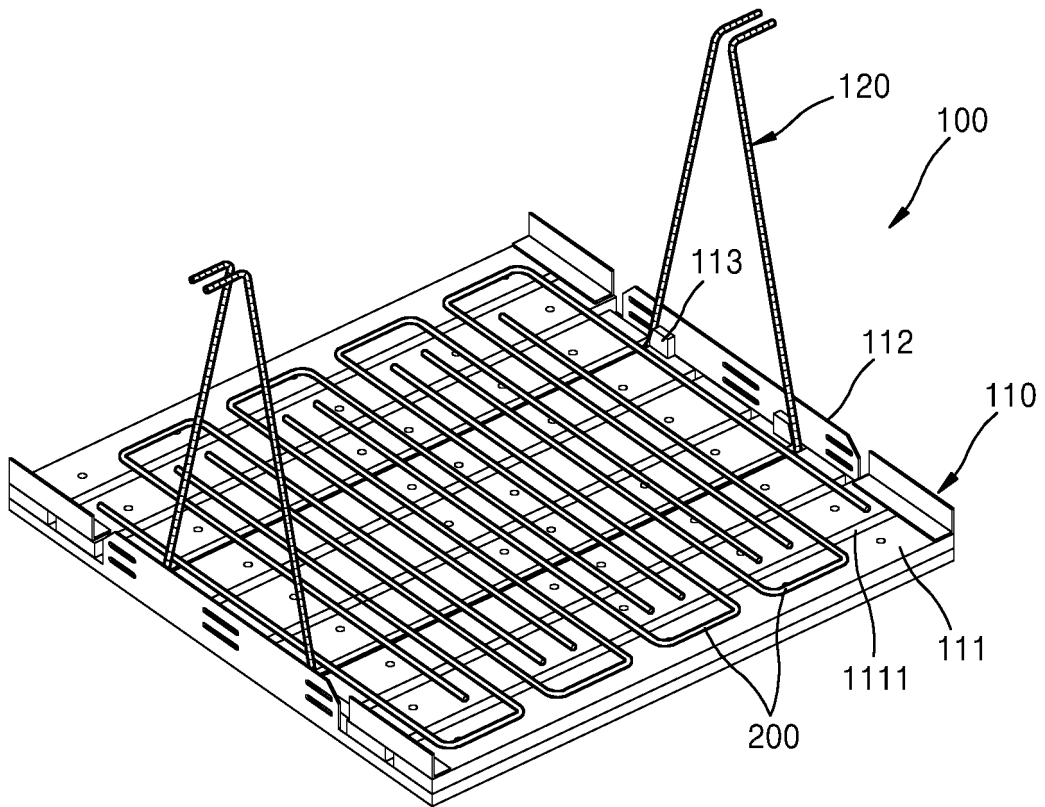


FIG. 4

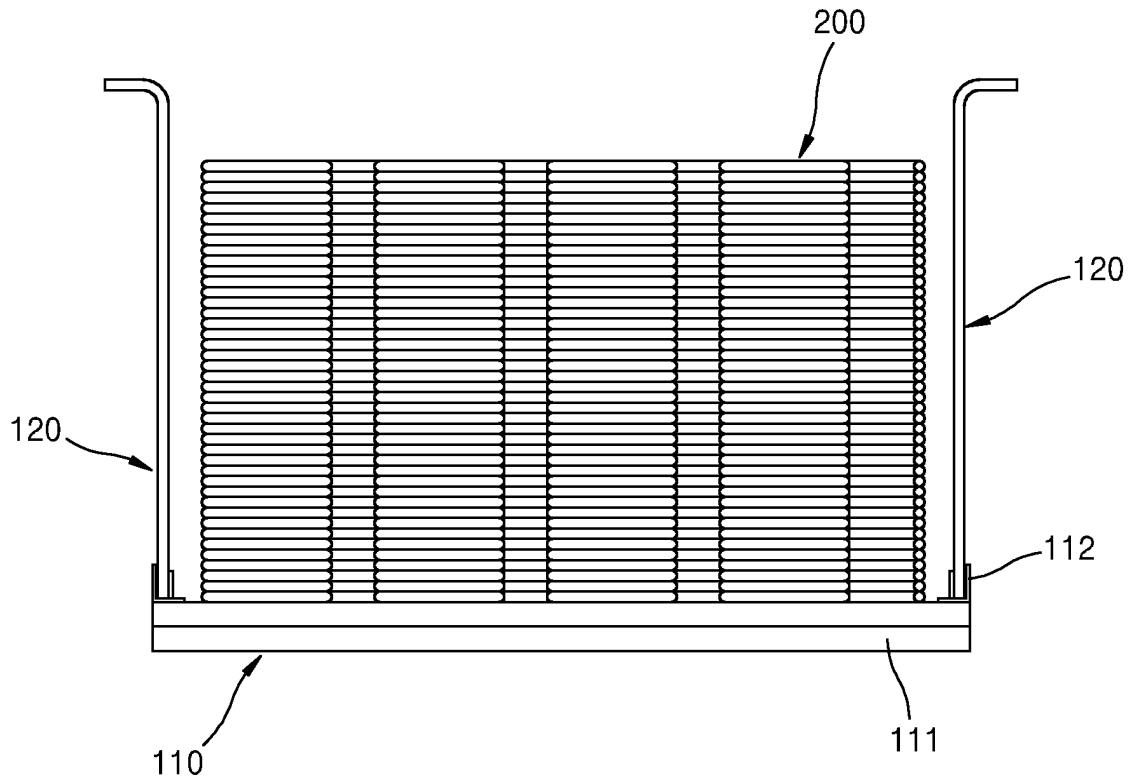


FIG. 5

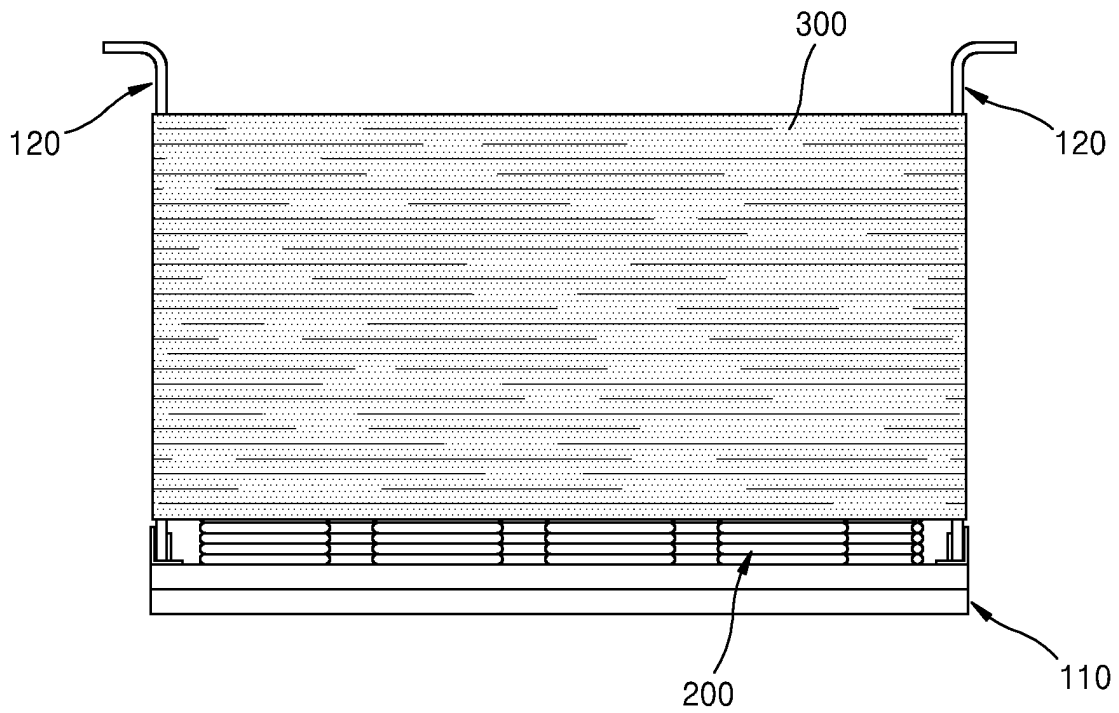


FIG. 6

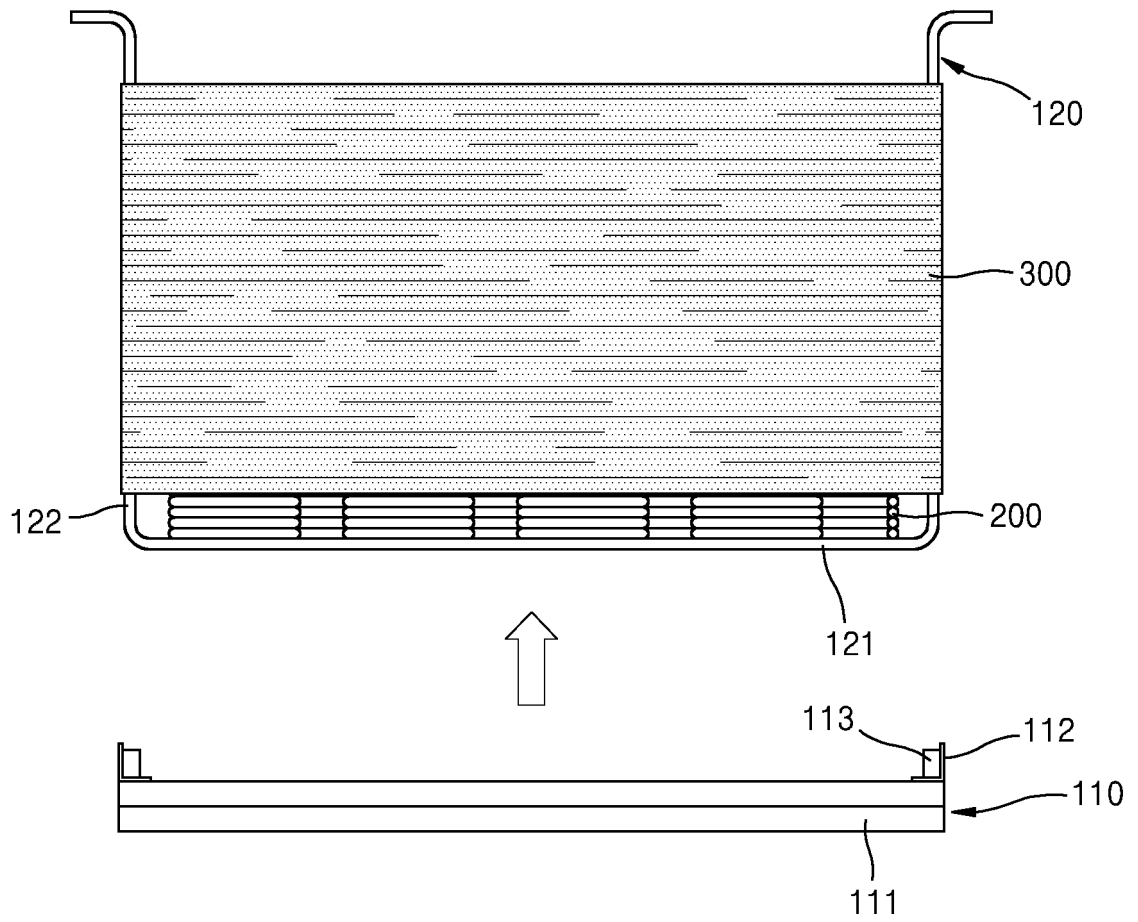


FIG. 7

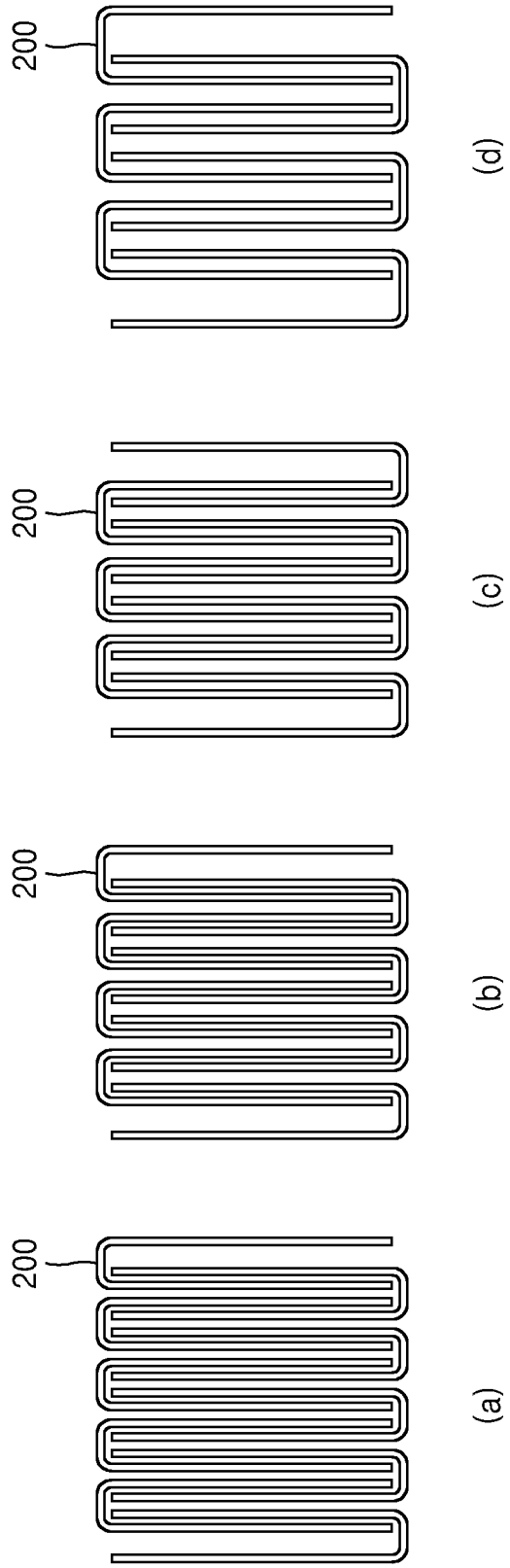


FIG. 8

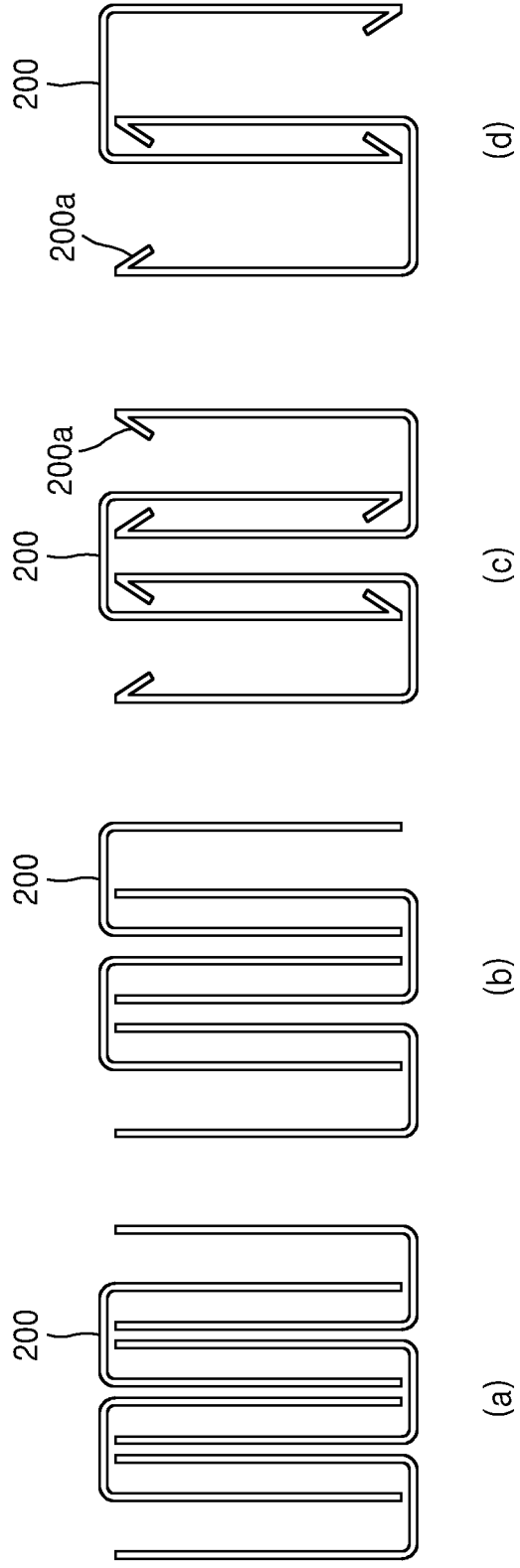
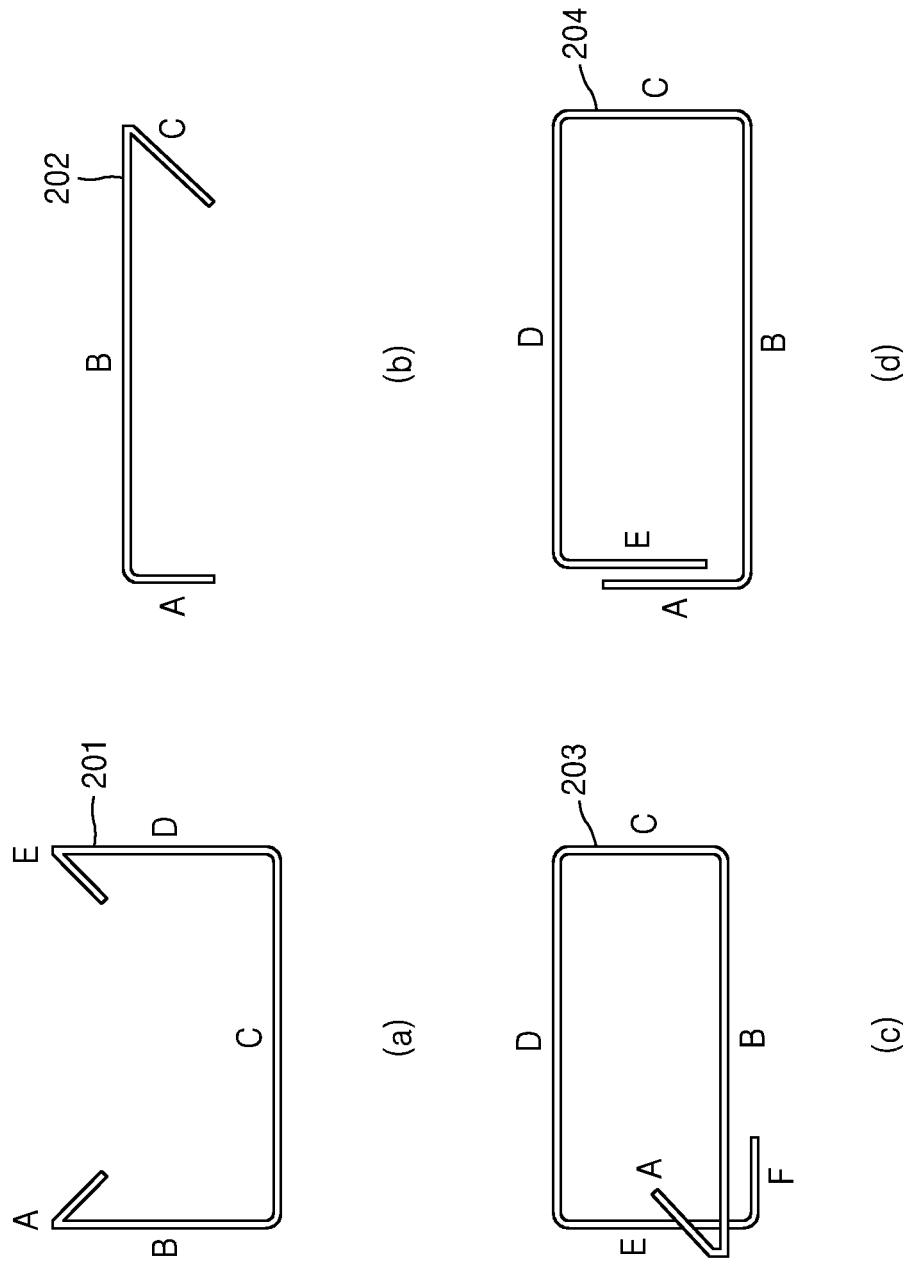


FIG. 9



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2018/004139

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A. CLASSIFICATION OF SUBJECT MATTER
B65B 11/02(2006.01); B65B 35/52(2006.01);
According to International Patent Classification (IPC) or to both national classification and IPC

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B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
B65B 11/02; B65D 85/48; B65D 19/42; B65D 19/38; B65D 19/22; B65D 19/44; B65B 27/08; B65B 67/00; B65D 71/02; B65B 35/52

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean Utility models and applications for Utility models: IPC as above
Japanese Utility models and applications for Utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS (KIPO internal) & Keywords: reinforcing bar, package, rectangular tray, support, vinyl, receiving groove, side wall plate, holder, inclined plane

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|-----------------------|
| Y | KR 20-0423531 Y1 (SONG DUK RENTAL PACKING CO., LTD.) 10 August 2006 See paragraphs [0045]-[0046], [0051]-[0052] and figures 3-4. | 6-9 |
| A | | 1-5 |
| Y | KR 10-2014-0095197 A (LEE, Sung Kyu) 01 August 2014 See claim 1 and figure 2. | 6-9 |
| A | JP 2002-002693 A (MISAWA HOMES CO., LTD.) 09 January 2002 See paragraphs [0004]-[0005] and figures 1, 5. | 1-9 |
| A | JP 2003-160105 A (MIZUSAWA, Akira) 03 June 2003 See paragraphs [0009]-[0014] and figures 1-5. | 1-9 |
| A | JP 2002-347829 A (SEKISUI HOUSE LTD.) 04 December 2002 See claim 1 and figures 1-6. | 1-9 |

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


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* Special categories of cited documents:
 "A" document defining the general state of the art which is not considered to be of particular relevance
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| Date of the actual completion of the international search 16 JULY 2018 (16.07.2018) | Date of mailing of the international search report 16 JULY 2018 (16.07.2018) |
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INTERNATIONAL SEARCH REPORT
Information on patent family members

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| International application No. PCT/KR2018/004139 |
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| Patent document cited in search report | Publication date | Patent family member | Publication date |
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Form PCT/ISA/210 (patent family annex) (January 2015)