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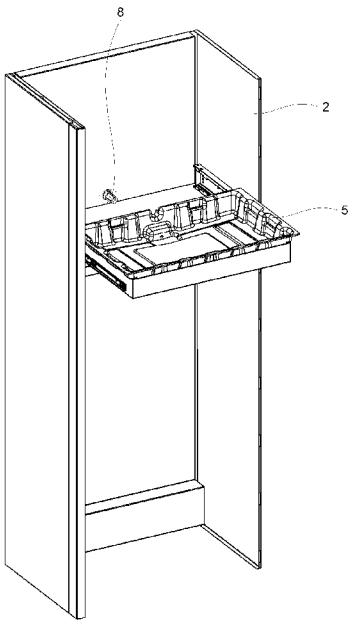
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(54) Title: A PLANT CULTIVATION CABINET COMPRISING A CONNECTION MECHANISM

(57) Abstract: The present invention relates to a plant cultivation cabinet (1) comprising a body (2); a door (3) providing access into the body (2); a tray (4) with a perforated base, wherein the mixture for growing the plants to be cultivated is placed; a unit (5) that is suitable for receiving the tray (4), that can move in a (z) axis extending in the perpendicular direction relative to the door (3) plane and wherein the excess liquid remaining after being absorbed by the mixture is collected; a female component (6) that is disposed at the rear side of the unit (5) and that enables the excess liquid collected in the unit (5) to be discharged out of the unit (5), and a male component (7) that is disposed on the body (2) and that engages with the female component (6) when the unit (5) is placed into the body (2) so as to discharge the excess liquid.

Figure 2



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Description

A PLANT CULTIVATION CABINET COMPRISING A CONNECTION MECHANISM

[0001] The present invention relates to a plant cultivation cabinet comprising a connection mechanism.

[0002] Healthy life trend becomes more popular with each passing day and the number of people following this trend gradually increases. One of the sub-branches of this trend is healthy diet. The number of practices that may be called "home farming" wherein the users cultivate the products they eat in a controlled environment in their houses increases with each passing day. In plant cultivation cabinets providing the performance of home farming practices, one of the most critical issues is the watering system. The watering system is composed of a plurality of fixed and movable connection elements. The female component on the units that can move forwards-backwards in the plant cultivation cabinet may not fully engage with the male component on the rear wall of the body due to production tolerances. In such a case, the watering system cannot fully perform its function.

[0003] The production process must be perfect in order to enable the male component and the female component to be perfectly aligned. The occurrence of this has a very low probability due to production tolerances. Therefore, in order to enable the female component at the back of the units and the male component at the rear wall of the body to be perfectly aligned, the female component of each unit and the male component require precision work and precise adjustments. This increases the production costs and causes customer dissatisfaction since the positions of the units in the plant cultivation cabinet cannot be changed. When a unit is mounted to the rack of another unit instead of its own rack predetermined by the producer as a result of precise production for each male and female component, problems arise in the water discharge system.

[0004] In the state of the art United States Patent Document No. US8549788B2, a hydroponic growing system is disclosed.

[0005] The aim of the present invention is the realization of a plant cultivation cabinet comprising a connection mechanism that enables the female component disposed on the unit that can move forwards-backwards and the male component disposed on the rear wall of the body to be engaged with each other without any problem.

[0006] The plant cultivation cabinet realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a body; a door providing access into the body, and a tray wherein the mixture for growing the plants to be cultivated is placed. The trays are placed into units in the body, that can move relative to the body and the door. The units are placed into sliding racks. The unit is the receptacle wherein the excess liquid that passes through the holes of the tray and that is not absorbed by the mixture is collected. The plant cultivation cabinet furthermore comprises a female component that enables the excess liquid collected in the unit to be discharged out of the unit, and a male component that is disposed on the body and that engages with the female component when the unit is placed into the body so as to discharge the excess liquid.

[0007] The plant cultivation cabinet of the present invention comprises a connection mechanism having a bracket wherein the male component is fixed and wherein the female component is fitted when the unit is placed into the body, and a bracket bearing that is arranged on the rear wall of the body and that allows the bracket to be moved therein in each of the three axes.

[0008] In an embodiment of the present invention, the plant cultivation cabinet comprises the bracket with one end being cylindrical and the other in the of a U. In this embodiment, the male component is located at the U-shaped end and the female component is located at the other end that is cylindrical. Thus, ease of use is provided.

[0009] In an embodiment of the present invention, the plant cultivation cabinet comprises the bracket bearing having a U-shaped channel wherein the U-shaped end of the bracket is movably fitted. The depth of the channel is more than the thickness of the U-shaped end of the bracket.

[0010] In an embodiment of the present invention, the plant cultivation cabinet comprises a bend that enables the bracket and the male component to be mounted to each other.

[0011] In an embodiment of the present invention, the plant cultivation cabinet comprises a housing that is arranged at the rear wall of the unit and that enables the female component to be mounted onto the unit.

[0012] All the detachable units in the plant cultivation cabinet of the present invention can be used with all the racks. Thus, the need for predetermining the positions of the units by the producer is eliminated, increasing the customer satisfaction and decreasing production costs.

[0013] The model embodiments relating to a plant cultivation cabinet realized in order to attain the aim of the present invention are illustrated in the attached figures, where:

[0014] Figure 1 - is the front view of a plant cultivation cabinet.

[0015] Figure 2 - is the perspective view of the body, the unit and the bracket in an embodiment of the present invention.

[0016] Figure 3 - is the perspective view of the connection mechanism, the bracket and the bracket bearing in an embodiment of the present invention.

[0017] Figure 4 - is the perspective view of the connection mechanism, the bend and the male component in an embodiment of the present invention.

[0018] Figure 5 - is the perspective view of the body, the unit and the bracket bearing in an embodiment of the present invention.

[0019] Figure 6 - is the perspective view of the tray, the unit and the female component in an embodiment of the present invention.

[0020] Figure 7 - is the perspective view of the tray and the housing in an embodiment of the present invention.

[0021] The elements illustrated in the figures are numbered as follows:

1. Plant cultivation cabinet
2. Body
3. Door
4. Tray
5. Unit

6. Female component
7. Male component
8. Bracket
9. Bracket bearing
10. Connection mechanism
11. Channel
12. Bend
13. Housing

[0022] The plant cultivation cabinet (1) comprises

- a body (2);
- a door (3) providing access into the body (2);
- a tray (4) with a perforated base, wherein the mixture for growing the plants to be cultivated is placed;
- a unit (5) that is suitable for receiving the tray (4), that can move in a (z) axis extending in the perpendicular direction relative to the door (3) plane and wherein the excess liquid remaining after being absorbed by the mixture is collected;
- a female component (6) that is disposed at the rear side of the unit (5) and that enables the excess liquid collected in the unit (5) to be discharged out of the unit (5), and
- a male component (7) that is disposed on the body (2) and that engages with the female component (6) when the unit (5) is placed into the body (2) so as to discharge the excess liquid.

[0023] The units (5) are placed into the plant cultivation cabinet (1) so as to cultivate plants in the body (2). The number and dimensions of the units (5) can be changed according to the dimensions of the body (2) and to the needs of the user. The trays (4) are placed onto the units (5). The plant cultivation cabinet (1) comprises a liquid receptacle positioned therein. The liquid in the liquid receptacle is delivered to the tray (4) by means of a pump in case the humidity of the mixture such as peat, etc. that is placed into the tray (4) and that enables the plants to take root and grow decreases below a value predetermined by the producer. The pumped liquid moisturizes the mixture in the tray (4) with perforated base and

provides the growth of the plants. The excess liquid passes through the holes of the tray (4) to be collected in the unit (5). The rear side of the base of the unit (5) is at a lower level than the front side thereof relative to a (y) axis extending in the horizontal direction with respect to the door (3) plane. Thus, the excess liquid is collected at the rear side of the unit (5). By means of the female component (6) and the male component (7) positioned at the rear wall of the unit (5) as a pipe with two ends open, the excess liquid is discharged from the unit (5) and delivered to the liquid receptacle.

[0024] The plant cultivation cabinet (1) of the present invention comprises a connection mechanism (10) having a bracket (8) wherein the male component (7) is fixed and wherein the female component (6) is fitted when the unit (5) is placed into the body (2), and a bracket bearing (9) that is arranged on the rear wall of the body (2) and that enables the bracket (8) to move therein in a (z) axis extending in the perpendicular direction and/or in a (y) axis extending in the vertical direction and/or an (x) axis extending in the horizontal direction relative to the door (3) plane.

[0025] The units (5) can move in a (z) axis extending in the perpendicular direction relative to the door (3) plane. When the user wants to harvest the products cultivated in the tray (4) or wants to sow plants into the tray (4), he/she pulls the unit (5) towards himself/herself. At this moment, the female component (6) on the unit (5) and the male component (7) on the bracket (8) at the rear wall of the body (2) are separated from each other. When the user replaces the unit (5), the free end of the bracket (8) catches the female component (6). In case the user cannot properly align the female component (6) and the male component (7), the female component (6) and the male component (7) can engage with each other without any problems since the bracket (8) can move in the bracket bearing (9) in at least one axis.

[0026] In an embodiment of the present invention, the plant cultivation cabinet (1) comprises the bracket (8) with one end being cylindrical and the other in the of a U. In this embodiment, the male component (7) is located at the U-shaped end and the female component (6) is located at the other end

that is cylindrical. Thus, the female component (6) can be more easily caught by the bracket (8).

[0027] In an embodiment of the present invention, the plant cultivation cabinet (1) comprises the bracket bearing (9) having a U-shaped channel (11) wherein the U-shaped end of the bracket (8) is movably fitted. The U-shaped end of the bracket (8) can move in the channel (11) in all of the three axes.

[0028] In an embodiment of the present invention, the plant cultivation cabinet (1) comprises a bend (12) that enables the bracket (8) and the male component (7) to be mounted to each other. Thus, ease of assembly is provided during production.

[0029] In an embodiment of the present invention, the plant cultivation cabinet (1) comprises a housing (13) that is arranged at the rear wall of the unit (5) and that enables the female component (6) to be mounted onto the unit (5). By means of the housing (13), the female component (6) can be easily mounted onto the rear wall of the unit (5).

[0030] In the plant cultivation cabinet (1) of the present invention, by means of the connection mechanism (10) composed of the bracket (8) and the bracket bearing (9), the female component (6) on the rear wall of the detachable units (5) and the male component (7) at the rear wall of the body (2) as the starting point of the water discharge line can engage with each other without any problems.

Claims

1. A plant cultivation cabinet (1) **comprising**
   - a body (2);
   - a door (3) providing access into the body (2);
   - a tray (4) with a perforated base, wherein the mixture for growing the plants to be cultivated is placed;
   - a unit (5) that is suitable for receiving the tray (4), that can move in a (z) axis extending in the perpendicular direction relative to the door (3) plane and wherein the excess liquid remaining after being absorbed by the mixture is collected;
   - a female component (6) that is disposed at the rear side of the unit (5) and that enables the excess liquid collected in the unit (5) to be discharged out of the unit (5), and
   - a male component (7) that is disposed on the body (2) and that engages with the female component (6) when the unit (5) is placed into the body (2) so as to discharge the excess liquid,

   characterized by a connection mechanism (10) having a bracket (8) wherein the male component (7) is fixed and wherein the female component (6) is fitted when the unit (5) is placed into the body (2), and a bracket bearing (9) that is arranged on the rear wall of the body (2) and that enables the bracket (8) to move therein in a (z) axis extending in the perpendicular direction and/or in a (y) axis extending in the vertical direction and/or an (x) axis extending in the horizontal direction relative to the door (3) plane.
2. A plant cultivation cabinet (1) as in Claim 1, **characterized by** the bracket (8) with one end being cylindrical and the other end in the form of a U.
3. A plant cultivation cabinet (1) as in Claim 2, **characterized by** the bracket bearing (9) having a U-shaped channel (11) wherein the U-shaped end of the bracket (8) is movably fitted.
4. A plant cultivation cabinet (1) as in any one of the above claims, **characterized by** a bend (12) that enables the bracket (8) and the male component (7) to be mounted to each other.
5. A plant cultivation cabinet (1) as in any one of the above claims, **characterized by** a housing (13) that is arranged at the rear wall of the unit (5) and that

enables the female component (6) to be mounted onto the unit (5).

Figure 1

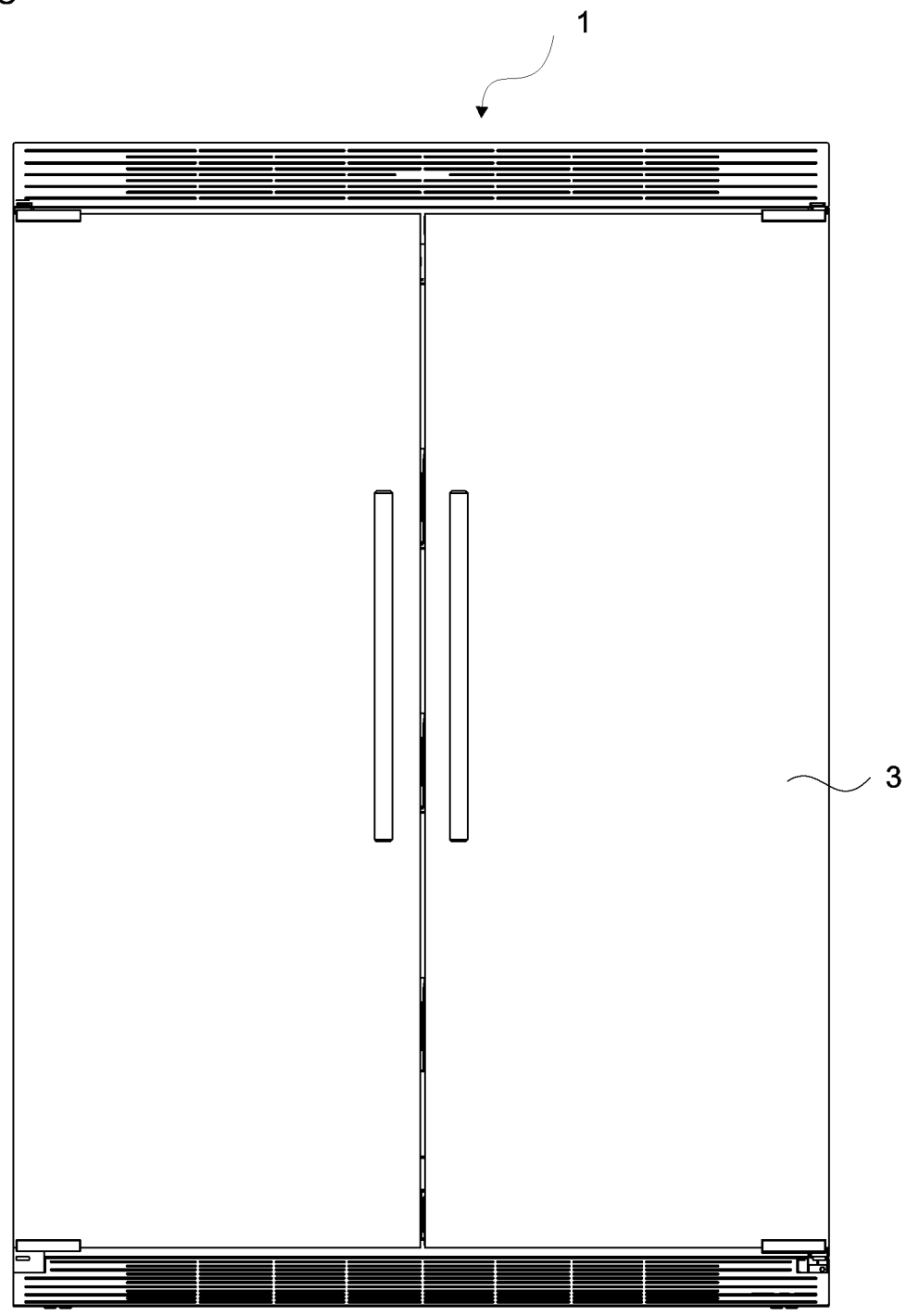


Figure 2

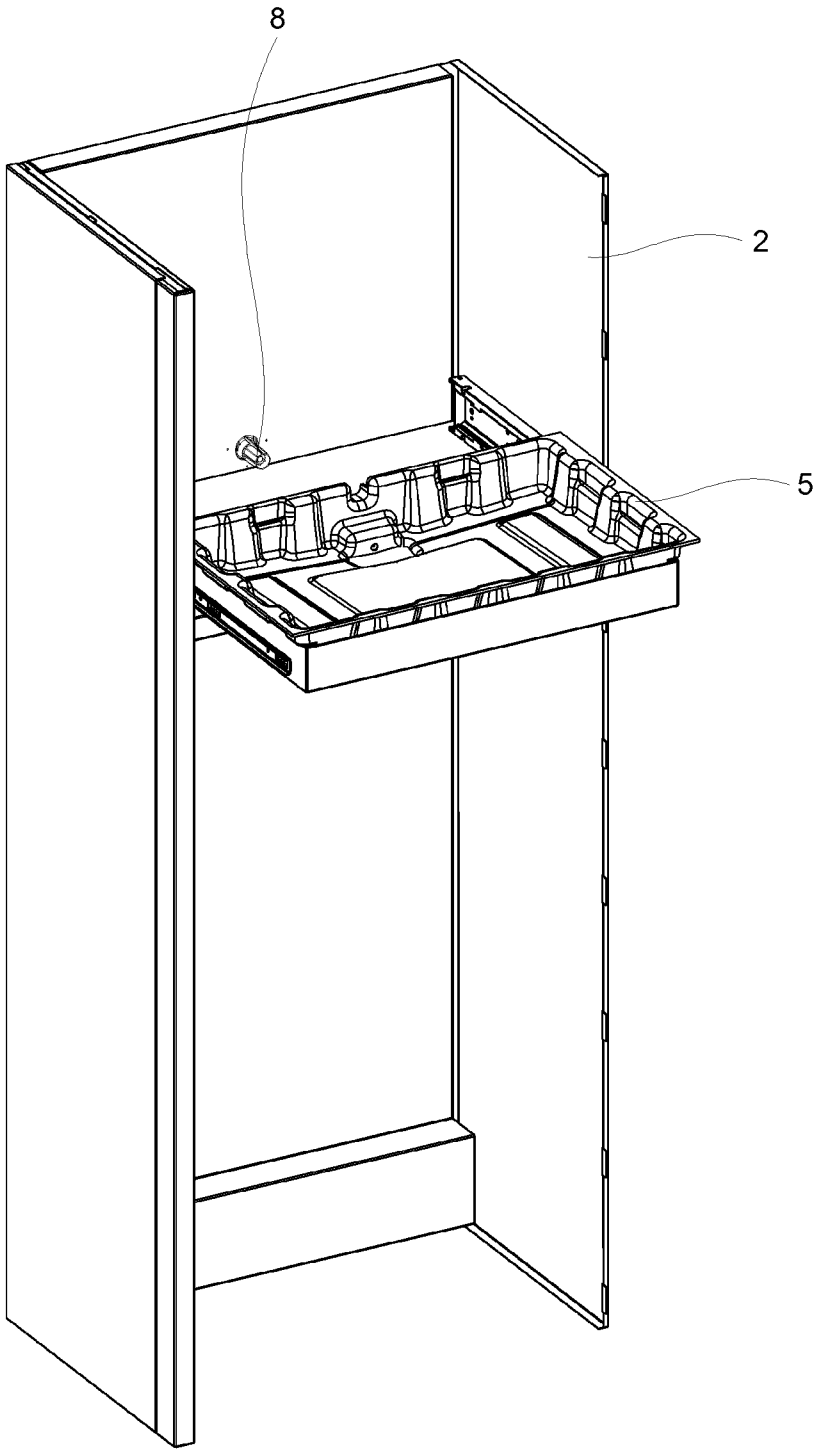


Figure 3

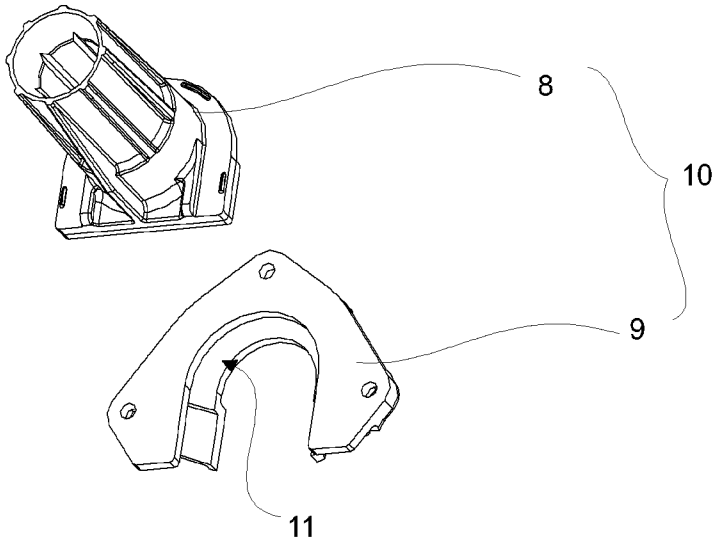


Figure 4

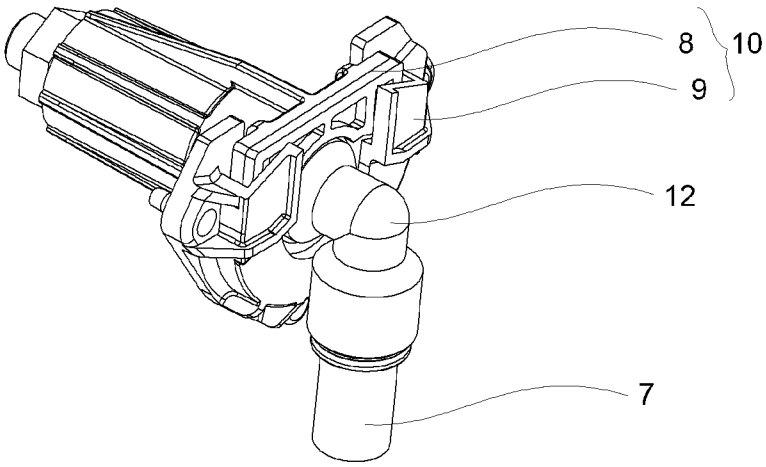


Figure 5

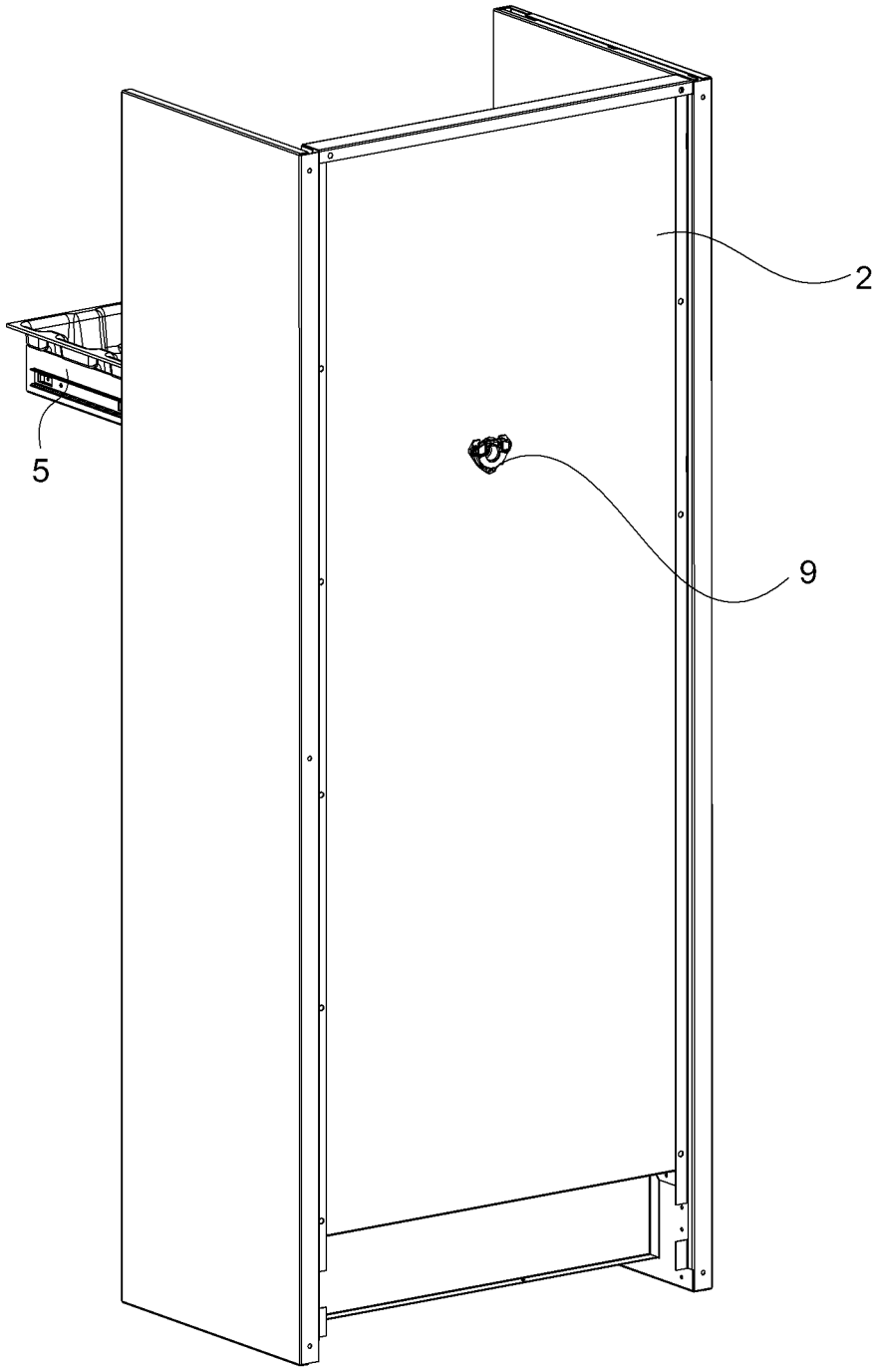


Figure 6

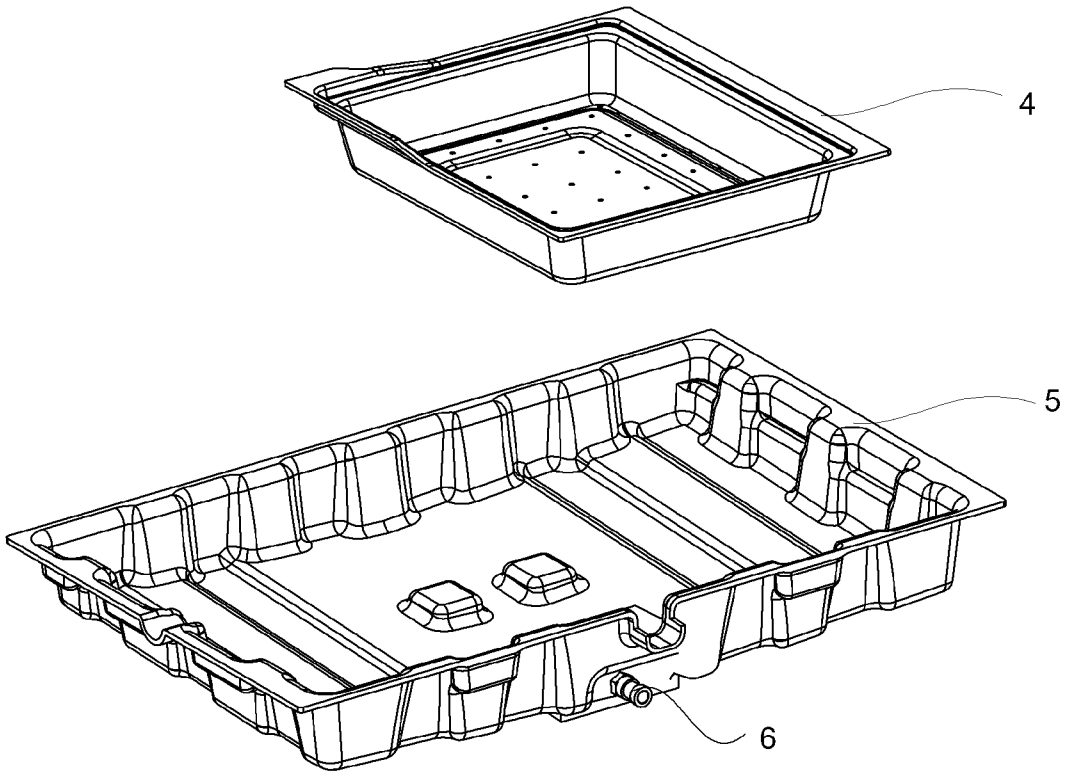
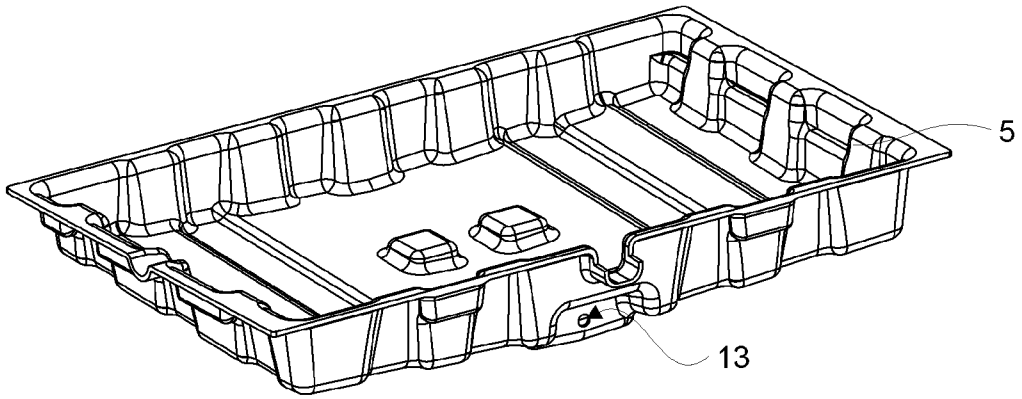


Figure 7



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/070186

A. CLASSIFICATION OF SUBJECT MATTER
INV. A01G9/00 A01G31/06
ADD. A01G31/00

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A01G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 3 005 861 A1 (HAIER GROUP CORP [CN]; QINGDAO HAIGAO DESIGN MANUFACTURE CO LTD [CN]) 13 April 2016 (2016-04-13)	1,4,5
A	paragraphs [0015], [0024], [0025]; figures 1,2,5,6	2,3

X	WO 2012/153918 A2 (HONG KUG YEUNG [KR]) 15 November 2012 (2012-11-15)	1,4,5
A	paragraph [0038]; figures 2-7	2,3

A	JP 2016 163596 A (U-TEC CORP) 8 September 2016 (2016-09-08) paragraph [0024]; figures 7,11	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
9 October 2018	16/10/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Weinmüller, C

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2018/070186

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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