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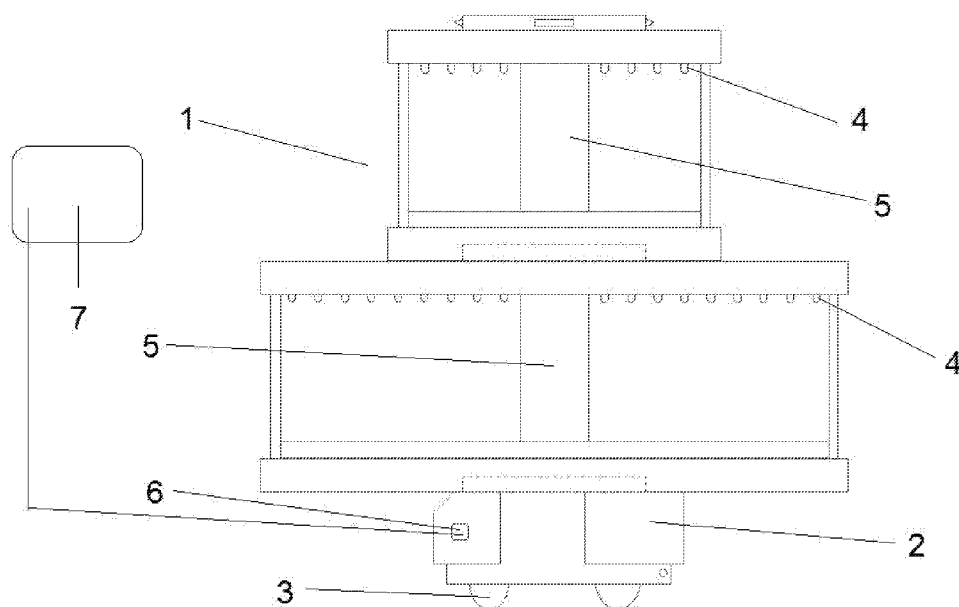


FIG. 1

(57) Abstract: The invention relates to a domestic autonomous vertical farm that is moveable in stackable units comprising: - a central structure that in turn comprises: - a base provided with movement means, - lighting means, - conduits for supplying water, and - a plurality of sensors, - a control unit to control the movement means, lighting means and the water supply based on the information received by the sensors, to which it is connected, and - a plurality of modular units, connected to each other and to the central structure, for housing the plants being grown.

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**DOMESTIC AUTONOMOUS VERTICAL FARM THAT IS MOVEABLE IN
STACKABLE UNITS**

OBJECT OF THE INVENTION

5 The present invention falls within the technical field of growing vegetables in containers, as well as in the field of hydroponic gardening and gardening with or without soil, and it particularly relates to a modular, vertical, autonomous and mobile gardening device for the controlled growing of plants in closed spaces.

10 BACKGROUND OF THE INVENTION

 It is estimated that by the year 2050 the demand for food will have increased by more than 50% with respect to current demand, meaning that vertical farming techniques have been developed. The concept of the vertical farm was created to reduce the use of resources and spaces and to maximize benefits.

15 A plurality of vertical farm models are known in the current state of the art. For example, the patent with the publication number US20030075208A1 is related to a controlled growth chamber for irrigating, draining, providing light to, heating or cooling plants for consumption. The invention specifies that it is a chamber that will help substitute part of the soil used for agricultural farms or greenhouses to produce a
20 vertical and modular farm. It is possible for this vertical farm to control all of the factors relating to the crops, in other words it is autonomous, but it is not transportable.

 Patent number US7080482 discusses a vertical farm apparatus for growing plants which uses a modular system. The advantage thereof lies in that the modules have flexibility so that they can be vertically assembled and horizontally bent in areas
25 where it is required to use space in a more efficient way. Although it is a flexible model in the assembly thereof, it continues to be a fixed system and is not ideal for use inside a house.

 The patent with the publication number US201 601 65821 A 1 relates to a device for growing plants which includes multiple boxes with connection units. The boxes are
30 growth chambers with tubes. This design is not easy to install or use, and it furthermore requires a lot of effort to connect the tubes in the units that are coupled together and does not allow for flexibility in adapting the units. It is another fixed system, or, in other words, it is not a transportable system.

 Patent number US8091279 discloses a very simple irrigation design and this
35 idea can be used for a transportable vertical farm. The concept thereof basically consists of baskets that can be stacked on top of each other to equally distribute water in the irrigation system thereof.

It has a small design that adapts to the space and it is possible for the user to move it from one place to another. The problem with this invention is that it requires constant human intervention and great effort for transporting the same, and it is not autonomous.

5 Patent number US7549250 relates to a vertical farm design that consists of a central light source and walls around the same. The plants sown on the walls are facing the central light and one of the walls can become detached so that the user can access the shelf.

10 The system rests on wheels, which allow the user to easily move it. The problem in this system is that it requires human intervention for the movement thereof. Another drawback is that due to its design, it is not applicable for domestic use.

DESCRIPTION OF THE INVENTION

15 The invention relates to a domestic autonomous vertical farm that is moveable in stackable units for the controlled growth of plants in closed spaces. Each stackable modular unit has a ceiling, which also serves as a casing for circuitry. This part houses a circuit that controls the lighting system and has sensors to monitor the conditions of the module. The base also has sensors that monitor the environment and send information to the base to communicate whether light or water is required. The lighting
20 system can be any type of lighting system, such as LEDs.

The upper part of the base has a coupling piece between the stackable units that allows the modular units to be coupled to the base of another stackable unit and has a locking mechanism that keeps it stable. The central pillar has multiple channels so that resources can be transported between the modular units. Distal pillars stabilize
25 the assembly and a small wall contains the excess water to subsequently be drained.

Once all of the modular units are connected to each other, the device functions as a single unit with the central command in a robot located on the base. The device is able to move in closed spaces thanks to the proximity sensors and computer vision thereof.

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DESCRIPTION OF THE DRAWINGS

As a complement to the description provided herein and for the purpose of helping to make the characteristics of the invention more readily understandable, in accordance with a preferred practical embodiment thereof, said description is
35 accompanied by a set of drawings constituting an integral part of the same, which by way of illustration and not limitation represents the following:

Figure 1 shows a front view of the farm with two stacked units connected to

each other.

Figure 2 shows an upper plan view of one of the units.

PREFERRED EMBODIMENT OF THE INVENTION

5 What follows is a detailed description, with the help of the figures referenced above, of a preferred exemplary embodiment of the object of the present invention.

Figure 1 shows a front view of a first preferred embodiment of the domestic autonomous vertical farm that is moveable in stackable units. A central structure (1) in turn comprises a lower base (2), provided with movement elements (3), a plurality of
10 lighting elements (4), conduits (5) for supplying water, and a plurality of sensors (6).

In the preferred embodiment shown herein, the movement elements (3) consist of wheels for movement by rolling, and the sensors (6) determine the incoming light energy and the degree of moisture. In turn, the conduits (5) are connectable to an external water source, such as a tap from the general network or a collection tank.

15 An external control unit (7), which is a computer type and can be programmed, controls the actuation of the movement elements (3), the lighting elements (4) and the water supply through the conduits (5) based on the information received by the sensors (6) to which it is connected.

Figure 2 shows one of the modular units, which are able to be connected to
20 each other and to the central structure (1), and which are intended to house plants being grown. Thus, the modular unit comprises a lower tray (8), intended to collect excess irrigation water coming from the conduits (5), and coupling elements (9), in this case male-female coupling, to connect to the central structure (1).

CLAIMS

1. A domestic autonomous vertical farm that is moveable in stackable units comprising
- 5 - a central structure that in turn comprises:
- a base provided with movement means,
 - lighting means,
 - conduits for supplying water, and
 - a plurality of sensors,
- 10 - a control unit to control the movement means, lighting means and the water supply based on the information received by the sensors to which it is connected, and
- a plurality of modular units, connected to each other and to the central structure, for housing the plants being grown.
- 15 2. The vertical farm according to claim 1, wherein each one of the modular units further comprises a lower tray to collect excess irrigation water.
3. The vertical farm according to claim 1, wherein each one of the modular units further comprises coupling elements to connect to the central structure.
- 20 4. The vertical farm according to claim 3, wherein the coupling elements are male-female coupling elements.

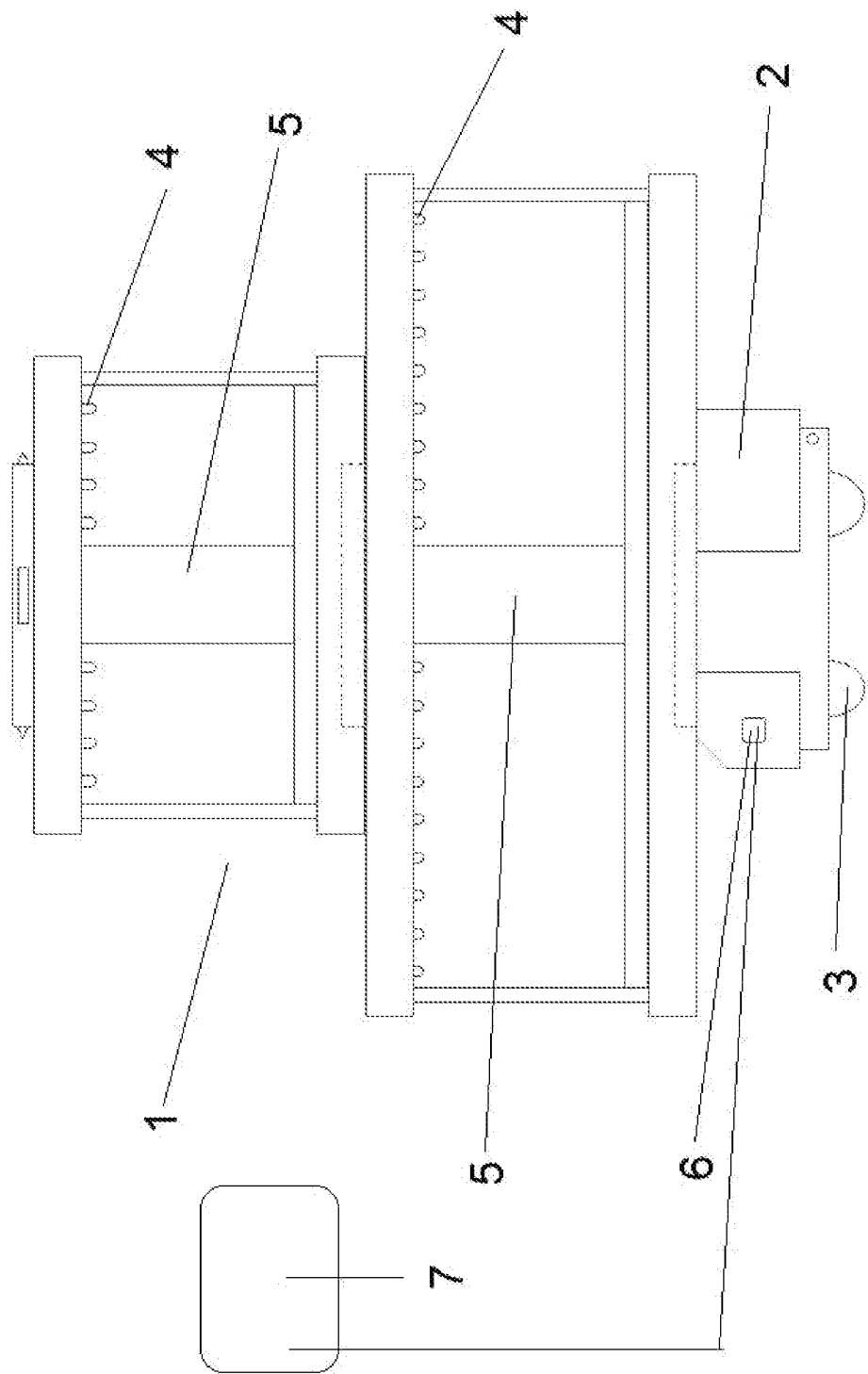


FIG. 1

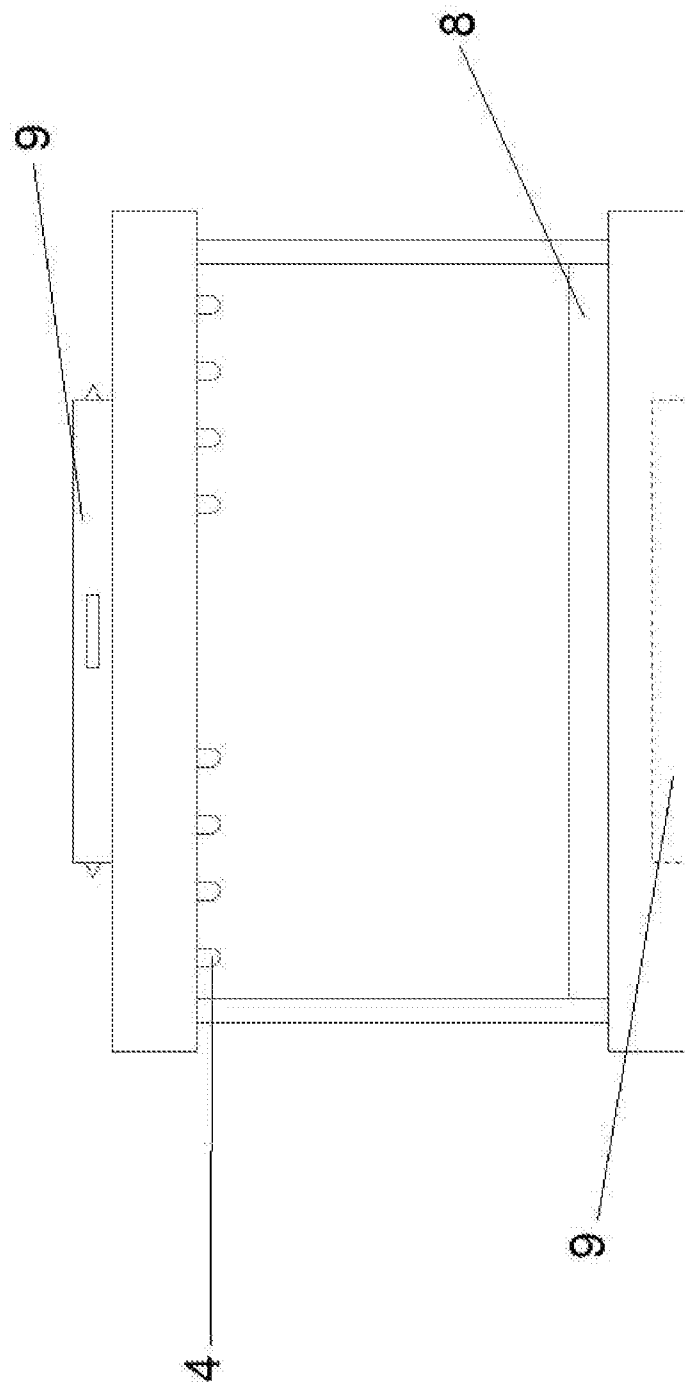


FIG. 2