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LUEBBERS et al.

(54) VERTICAL AEROPONIC PLANT GROWING SYSTEM

(76) Inventors: **TERRY LUEBBERS**, Lagrange, GA (US); **SARAH HENSLEY**, Lagrange, GA (US)

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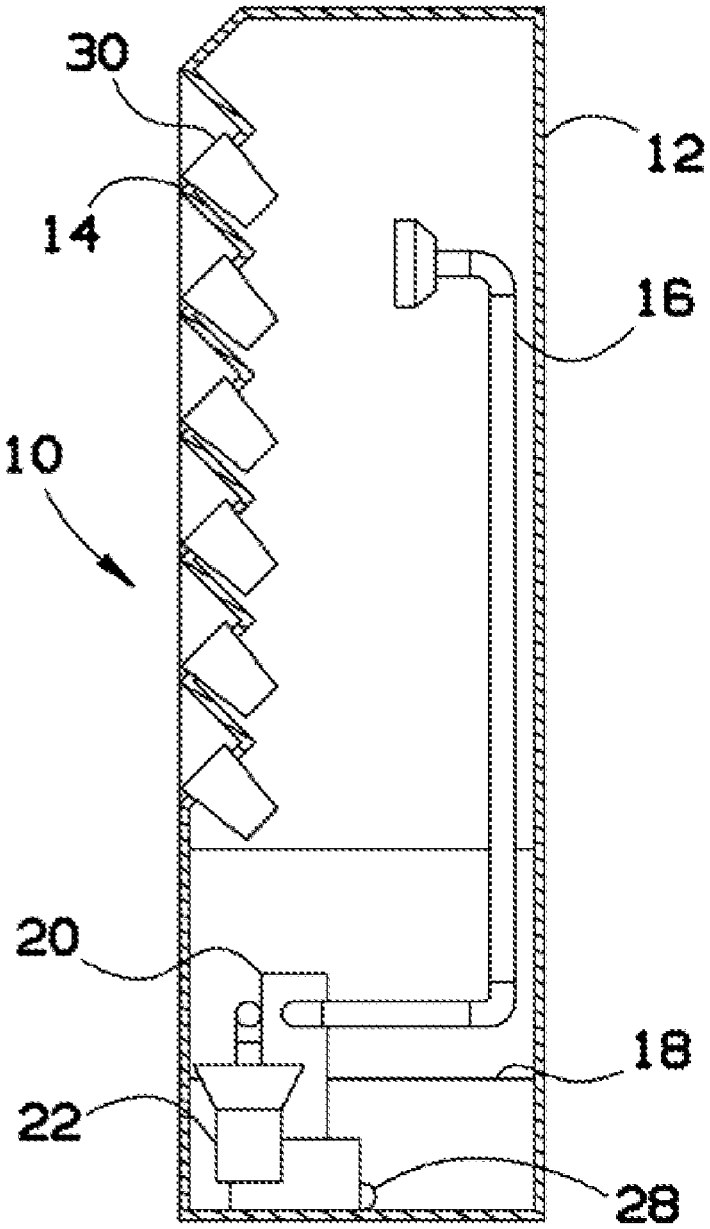
(57) **ABSTRACT**

An aeroponic plant growing system wherein the planting sites are vertically aligned allowing for the growth of plants in a fraction of the space necessary for traditional plant growing. The aeroponic system including a vertical frame, a plurality of orifices placed on the vertical frame, a container placed on at least one of the orifices, a fluid dispenser located in the interior of the vertical frame.



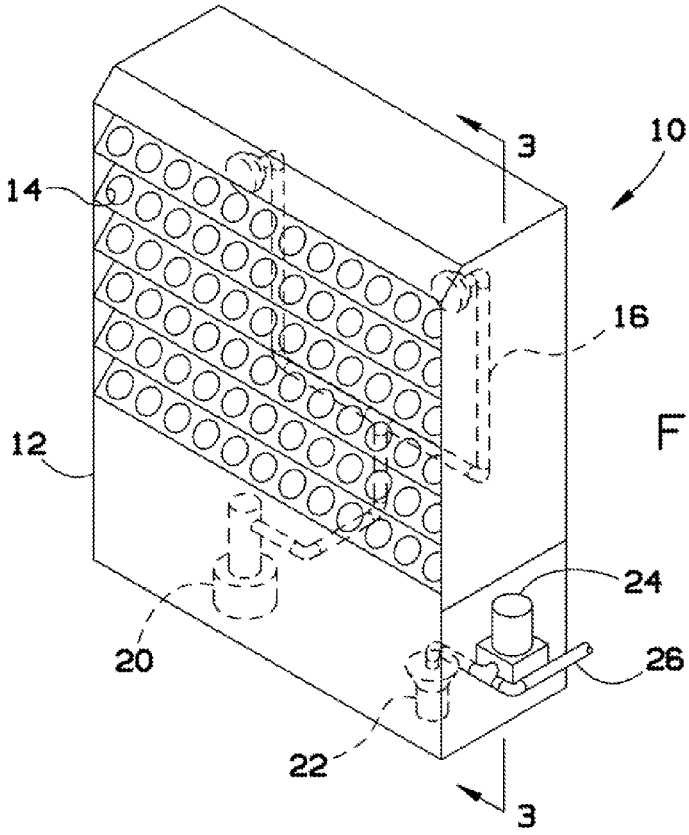


FIG. 1

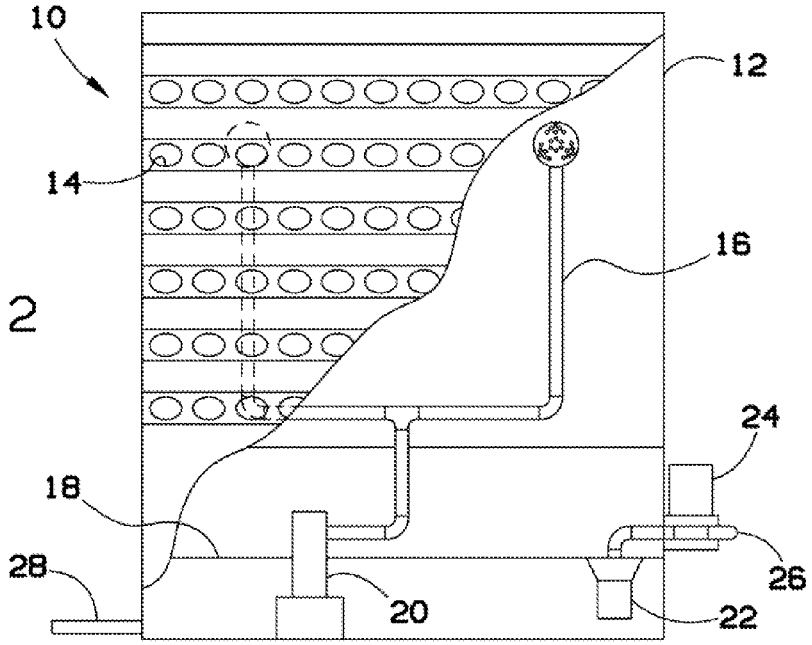


FIG. 2

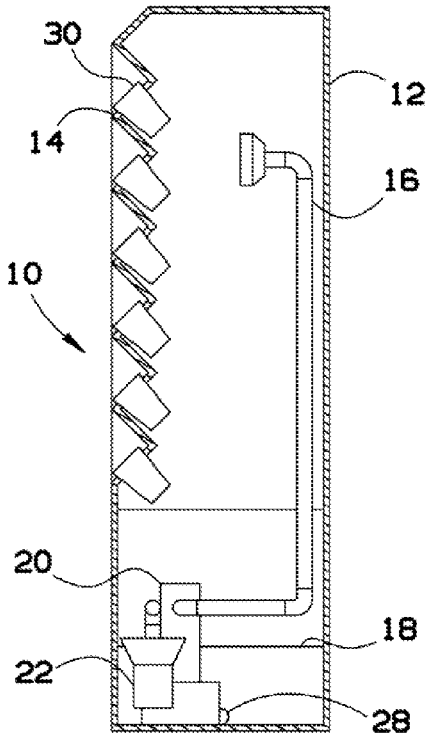


FIG. 3

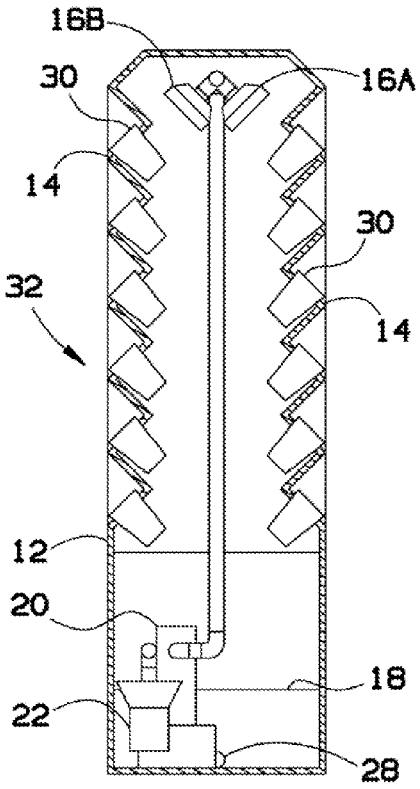


FIG. 4

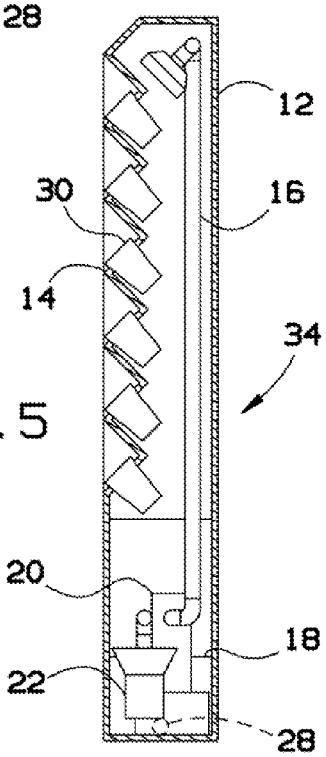


FIG. 5

VERTICAL AEROPONIC PLANT GROWING SYSTEM

BACKGROUND OF THE INVENTION

[0001] The present invention generally relates to an aeroponic plant growing system. More particularly, the present invention relates to an aeroponic plant growing system for allowing vertical alignment of the planting sites for the growth of plants in a fraction of the space necessary for traditional horizontal or right angled hydroponic or aeroponic applications.

[0002] Indoor cultivation of fruits, vegetables, flowers, and ornamental plants has increased considerably in recent years. Aeroponic plant growing is one of the recent methods of indoor cultivation that is increasing in popularity. The aeroponics method grows the plants in an air or mist environment without the use of soil or an aggregate medium. In this method, the roots of the plant are exposed to an atomized nutrient solution, with the leaves and crown extending above a container holding the plant. Various aeroponic plant growing systems are commercially available. Unfortunately, in the known aeroponic systems, the containers are placed on the frame at a fixed angle or horizontal alignment limiting the capacity and size of the aeroponic system.

[0003] As can be seen, there is a need for an aeroponic system including containers that are removable from the frame. In addition, there is a need to provide an aeroponic system in which the container's alignment is vertical.

SUMMARY OF THE INVENTION

[0004] In one aspect of the present invention, an aeroponic system includes a vertical frame, a plurality of orifices placed on the vertical frame, a container placed on at least one of the orifices, a fluid dispenser located in the interior of the vertical frame, the containers are vertically aligned.

[0005] These and other features, aspects and advantages of the present invention will become better understood with reference to the following drawings, description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. **1** illustrates a perspective front view of an aeroponic system according to an exemplary embodiment of the present invention;

[0007] FIG. **2** illustrates a detailed front view of the aeroponic system of FIG. **1**;

[0008] FIG. **3** illustrates a cross-sectional view of the aeroponic system of the present invention taken along line **3-3** in FIG. **1**;

[0009] FIG. **4** illustrates a sectional view of an aeroponic system according to another exemplary embodiment of the present invention; and

[0010] FIG. **5** illustrates a sectional view of an aeroponic system according to another exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0011] The following detailed description is of the best currently contemplated modes of carrying out exemplary embodiments of the invention. The description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating the general principles of the invention, since the scope of the invention is best defined by the appended claims.

[0012] Various inventive features are described below that can each be used independently of one another or in combination with other features.

[0013] Broadly, embodiments of the present invention generally provide an aeroponic plant growing system for allowing vertical growth of plants in a fraction of the space necessary for traditional plant growing.

[0014] FIGS. **1-3** illustrate an aeroponic system **10** according to an exemplary embodiment of the present invention. The aeroponic system **10** includes a vertical frame **12** having a plurality of orifices **14** placed on at least one of the faces of the vertical frame **12**. The vertical frame **12** may be made of a non-corrosive material. The vertical frame **12** may be made of plastic, stainless steel, non-corrosive metals, polymeric material, or composite material. The size of the vertical frame **12** may depend on the user preferences.

[0015] The orifices **14** may be placed on at least one of the front face and the back face of the vertical frame **12**. The size of the orifices **14** may depend on the type of plant (not shown) to be grown.

[0016] A container **30** may be placed on each orifice **14** of the vertical frame **12**. The container **30** may allow the user to easily add and remove the plants (not shown) from the vertical frame **12**. The containers **30** may be vertically aligned inside the vertical frame **12**. By aligning to planting orifices in a vertical manner you greatly increase the flexibility of the size of the growing unit while maintaining the original number of planting sites. In current applications the size of the overall unit has to increase horizontally in order to increase the planting sites and if decreased the planting sites also decrease. The plant seeds or cuttings (hereafter called the seeds) may be first germinated and rooted in growth cubes (not shown) such as pressed peat. Once the roots may be visible on the outside of the cubes, the plants (not shown) may be placed on the container **30** with the root facing the inside area of the vertical frame **12**. The plants (not shown) may be held in place inside the container **30** by using inert clay pellets or similar material. The size of the container **30** may depend on the size of the orifices **14** and the size of the plant (not shown). The container **30** may be made of a sturdy material. The container **30** may be made of plastic, carton, metal, wood, light rubber, polymer, or composite material.

[0017] A reservoir **18** may be placed inside the vertical frame **12** or built into the structure of the vertical frame **12** to allow the recapture and reuse of the of the nutrient solution. The reservoir **18** may be located at the bottom end or the top end of the vertical frame **12** or built into the vertical frame **12**. The reservoir **18** may be adapted to receive and hold a fluid. The fluid may be water and/or a nutrient solution. The size of the reservoir **18** may depend on the size of the vertical frame **12** and the number of orifices **14**. The fluid may be applied to the root of the plants (not shown) by using a fluid dispenser **16**.

[0018] The fluid dispenser **16** may be a commercially available sprayer, nozzle, a soaker hose, or a fogger. The angle of the fluid dispenser **16** may be adjustable. In addition, the height of the fluid dispenser **16** may be adjustable.

[0019] As can be seen on FIGS. **1-5**, the reservoir **18** may be located on the bottom end of the vertical frame **12**. In this embodiment, the fluid dispenser **16** may be operated by a pump **20** located inside the reservoir **18**. The pump **20** may be a commercially available fluid pump. The pump **20** may be manually operated by the user or may be set on a cycle timer for automatic operation. A float valve **22** may be placed inside

the reservoir **18** to maintain the water/nutrient level. The float valve **22** may be a commercially available float valve. The float valve **22** may be connected to an injector **24** and to a fresh water line **26**. The injector **24** may automatically maintain proper nutrient levels by adding the proper amount of nutrients along with fresh water to the reservoir **18**. The nutrient solution may be recycled inside the reservoir **18**. The reservoir **18** may include a drain device **28** to help discard the fluid solution from the reservoir.

[0020] In some embodiments, the reservoir **18** may be located at the top end of the vertical frame **12**. In this embodiment, the fluid dispenser **16** may be operated manually by gravity.

[0021] FIG. **4** illustrates an alternate embodiment of the aeroponic system **32**. In this embodiment, the vertical frame **12** may include orifices on the front face and the back face. The fluid dispenser **16** may include a first nozzle head **16***a* and a second nozzle head **16***b*. The first nozzle head **16***a* may be directed to the front face of the vertical frame **12**. The second nozzle head **16***b* may be directed to the back face of the vertical frame **12**. In this embodiment, a central sprayer device may be used to evenly distribute the nutrient solution to both sides of the vertical frame **12**.

[0022] FIG. **5** illustrates an alternate embodiment of the aeroponic system **34**. In this embodiment, the width of the vertical frame **12** may be reduced to **9** inches reducing the amount of space the aeroponic system **10** uses without reducing the number of planting sites.

[0023] A filter (not shown) may be added to the fluid dispenser **16** to prevent clogging.

[0024] It should be understood, of course, that the foregoing relates to exemplary embodiments of the invention and that modifications may be made without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. An aeroponic system comprising:

a vertical frame including a front face, a back face, an interior, a top end, and a bottom end;

a plurality of orifices placed on at least one of the front face or the back face of the vertical frame;

a container placed on at least one of the orifices; and

a fluid dispenser located in the interior of the vertical frame.

2. The aeroponic system according to claim **1**, further including a reservoir connected to the fluid dispenser.

3. The aeroponic system according to claim **1**, wherein the fluid dispenser is a sprayer, wherein the sprayer is single or double sided.

4. The aeroponic system according to claim **1**, wherein the fluid dispenser is a soaker hose.

5. The aeroponic system according to claim **1**, wherein the fluid nozzle includes a fogger.

6. The aeroponic system according to claim **1**, wherein the fluid nozzle is operated by a pump or by gravity.

7. The aeroponic system according to claim **1**, wherein the pump further includes a timer to automatically activate or deactivate the pump.

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