A PLANT CULTIVATION SYSTEM USING HUMIDIFIER

Technical field

The present invention relates to agriculture and engineering, devices and method, in particular humidifier cultivation and process.

Background

Humidity is an important factor for cultivating all kinds of plants and every step in the cultivation. That is in the area of the trunk and leaves plant. When the humidity in the air is high, the plant will suffer from dehydration. And when the humidity in the air is decreased, the plants will dehydrate faster and more quickly. The roots of the plant will grow well and tilt in the area with water or humidity. In addition, each plant requires a different amount of humidity. Mushroom and moss are examples of plants that especially require humidity all the time, so the system has to develop a humidifier to help these different types of plant grow.

WIPO Publication No. 204762524 describes the automation system to control humidity, temperature, carbon dioxide and ammonia gas that suitable for mushroom cultivation. The monitoring sensor and ultrasonic humidifiers can be replace the labour and the number of workers in the cultivation industry. But the subject matter of the present application is only suitable for mushrooms. It is not suitable for other crops.

WIPO No. CN204350743 describes the invention of equipment and processes to control the environment in a closed system in which the humidity is increased by spraying water throughout the closed system. This patent does not specify the importance and characteristics of the humidifier. It only focuses on the overall system of closed plant cultivation.

WIPO Publication No. 1020020068980 describes the process of plant cultivation through the use of an ultrasonic humidifier. The mist generated increases humidity at the pot area by spraying the mist from the top of the plant. And the humidifier also placed below the bottom of the pot.

The previous invention is to add humidity to the cultivation system and does not remove any water or solution that is released into the recycle system. This causes a waste of resources and a loss of energy in industry. Recycling is also a way to preserve the environment.

Humidity is a major problem in cultivation. Fans break down because moisture tends to stick to the fan blades increasing their weight. Eventually, such fans stop working and collapse. The problem can be solved by using a waterproof fan. It can increase the use life, but these too, eventually fail. Alternatively, one simply accepts this as a problem and simply uses cheap replaceable fans. The problem can be solved by using on-off fan timer for cleaning and maintenance periodically. This method is very difficult to use in the industry and employs more people on account of fan maintenance.

Summary of The Invention

According to the present invention there is provided a humidifier cultivation and process. The apparatus develops a humidifier system for cultivation by developing recycled resources and solving problems. Short-lived fan or no fan require for this method. This method also applies to a variety of crops, not specific to any kind of plants. The invention uses a blower with special feature instead of a fan. The invention technique is to use a blower instead of a general fan. The fan has a pressure less than 1000 mnH2O. The blower have a pressure 1000 mmH2O up to 10 mH2O which is higher than the fan pressure. The process of carrying the solution vapor from the humidifier back into the system. And to create a special hose is to send the solution and / or solution vapor. To weld the equipment in some route reduce the blower operation and remove the condensed solution from the blower release out of the blower.

Brief Description of The Drawings

An embodiment, incorporating all aspects of the invention, will now be described by way of example only with reference to the accompanying sheets of drawings in which

Figure 1 is block diagram of the process of humidity for cultivation in accordance with an embodiment of the process.

Figure 2 is block diagram showing the humidifier system and apparatus.

Detailed Description

According to the present invention refers to the cropping inside the growing chamber (5). The growing chamber (5) has a cavity with entrance of atomized mist and / or solution at least one passage and has plants or roots or both of them.

Definition of humidifier in the present invention refers to any device that creates or gives humidity to the system. The internal components work together by connecting at least one the passages of the atomized mist and / or solution at least four components. That are including of storage tank (1) , humidifier (3), growing chamber (5) and drain tank (7) which welded together like close path.

The process of humidity control for cultivation describe as figure 1 which comprises of the solution in the storage tank (1) flows through the pump (2) to the humidifier (3) and the solution volatile to atomized mist and enter into the blower (4). The blower (4) sucks the atomized mist and blows the mist through the passage or, in the present invention that the passage is two pipes. The first pipe is connected to the growing chamber (5) with the plant (8). So the part of plant (8) can be located either in the plant (8), whereas the plant (8) is the growing chamber (5) with trunk and / or some part of the plant (8) as well. When the atomized mist gives the humidity in the growing chamber (5), the condensation of atomized mist becomes liquid. The liquid flows through the pipe back into the humidifier (3) again. So the recycling of the solution can occur.

The second pipe of the blower (4) is connected to the drain tank (7) through a special design pipe (6) that look like crap and hole. It serves to keep the atomized mist and some of atomized mist. So the atomized mist flow through growing chamber (5) and stick with an electronic blower. It causes damage and collapses in the end. When the blower use water-resistant characteristic, it cannot be prevented all of water. The sticked atomized mist condense to solution that stick to the blower. So the weight of blowers increase and need more power to rotate. Then the inner components burn and eventually collapse. Hence, there creates a path or a passage or pipe for carrying the solution and the specific solution to the drain tank (7). The drain tank (7) act as the solution storage that limit the volume of solution. When the solution and atomized mist enter the drain tank (7), they accumulate to the required level. So that the switch (701) and (702) transmit signal to drain the solution, the solution level in the drain tank (7) is the maximum level. The switch (701) sends the signal to the pump (703) that carry the solution in pipe through the storage tank (1) again. As resulting, the recycle of the atomized mist and the solution is recycled back. And when the solution level of the drain tank (7) decreases to the lowest level, the switch (702) transmit the signal to the pump (703) to stop working.

Special design pipe (6) has many designation, such as letter U, letter J, letter W and to make cruel like hole at least 1 hole. That is to accumulate some of atomized mist and some of

solution. By constructing the specific pipe, the pressure in the pipe at the blower (4) and in the drain tank (7) is not equal. And the higher pressure area pushes the atomized mist and solution to the area with less pressure.

There are several ways to keep the pressure differentiate in the pipe. Appropriate methods include: 1. By reducing the pipe diameter. This eliminates the flow path by using pipe joints which different diameter of the pipe. This will make some of atomized mist and some of solution flow out of system. As a result, the other electrical components in the system are damaged by humidity. 2. By installing the open valve and close valve which change the direction current. 3. By installing the flux meter of the solution with pressure monitoring (Diaphragm type) which will lose pressure from the flux measurement sheet. 4. By bending pipe. The best way is to bend the pipe because it reduces the installation equipment and reduce its energy.

The bending of the pipe in the present invention is the special design pipe (6) with the above characteristics. The pressure inside the two pipes must be considered. The case is in the following table.

To compare pressure at nearby pipe	Incident
Storage tank more higher than blower	Blower collapsed
Storage tank higher than blower	Blower collapsed
Storage tank equal to blower	Blower collapsed
Storage tank less than blower	Solution flow in the pipe through storage tank
Storage tank more less than blower	Solution and atomized mist flow out

How to make an appropriate special design pipe (6) that is to set the pressure of the drain tank (7) less than the bowler in higher case and much smaller case. The implementation of a special design pipe (6) is to set the pressure of the drain tank (7) less than the pressure in the blower a little. To push the solution to the drain tank (7) by using a pipe like the letter U with

unequal tail pipe. Its characteristic like the letter J and / or the letter J backward. The pipe at the blower is higher than the drain tank. If a pipe at blower is higher than the drain tank, the atomized mist and / or solution flow out to the growing chamber (5). If the position of pipe at storage tank is higher than the blower, the solution will drain to the bending pipe and flow back to the blower. The blower will collapse eventually.

The system of the humidifier apparatus, the humidifier (3) as shown in figure 2. For some the pipe that carry the solution from the storage tank (1) flow through the pump (2) and to the humidifier (3) connect to the solenoid valve (305). Then the solution flow into the tank of humidifier (302) which store the solution with maximum and minimum scales for the volume of solution in the tank. When the solution enters the tank of humidifier (302), the humidity generator (301) works by evaporate the solution to vapor or atomized mist that flow in a pipe connected to the blower (4).

The tank of humidifier (302) has a pipe that connected to the growing chamber (5). That is the blower for pulling the atomized mist to the growing chamber (5). And the path which has no blower is to carry the solution in the growing chamber (5) flow back to the tank of humidifier (302). When the solution in the tank of humidifier (302), up to the maximum value set, then the switch (303) acts to signal the solenoid valve (305) close. The solution from the storage tank (1) stop flowing. When the solution in the tank of humidifier (302) decreases to the minimum scale, the switch (304) activates the solenoid valve (305) to open causes the solution from the storage tank (1) into the tank of humidifier (302).

In addition, solenoid valves (305), switches (701) and (702) act as transmitters associated with the solution level according to the present invention. That can be replaced by any system such that sends a signal to control the volume of solution.

According to an aspect of the present invention the humidifier cultivation and process are described as the humidifier for cultivation and process, that including of,

i.Special design pipe (6) with passage or path of the atomized mist and / or solution to the drain tank (7) and blower (4) which has for some a point such that look like crap and hole.

And/ or,

ii.The system of humidifier apparatus comprising some closed path such that the way for the atomized mist and/or the solution and the closed path consist of at least 4 vertexes : the storage

tank (1), the humidifier (3), the growing chamber (5) and the drain tank (7). The definition of closed path belongs to graph theory, mathematics.

Either i. or ii. , or both. The humidifier apparatus has special characteristics that suitable for the process, comprising:

1. Special design pipe (6) has the suitable designations, that is, similar to the letters U, the letters J, the letters W and letter J backward. The most suitable designations is similar to the letter J and the letter J backward.

2. Special design pipe (6) shall be considered for the pressure of the pipe in the vicinity of the blower (4) and the pipe near the drain tank (7). The suitable pressure is the pressure in the drain tank (7) less than the pressure in the blower (4) area.

3. The special design pipe (6) will be connect the blower (4) to the position next to the blower (4), such that count from the atomized mist path from the humidifier (3) or the same area as the blower installation. And bring the atomized mist and / or solution that sticky the blower (4), the atomized mist and / or solution in the boundary to the pipe which has the special pipeline (6). The suitable area for connect the blower (4) is the position nearly the next blower (4).

4. The special design pipe (6) is also a component of the passage of the atomized mist and / or solution between the drain tank (7) and the growing chamber (5).

5. The process of humidity for cultivation for some a closed path includes the storage tank (1), the humidifier (3), the growing chamber (5) and the drain tank (7). That can be add any devices to connected each path among the storage tank (1), the humidifier (3), the growing chamber (5) and the drain tank (7), whereas the atomized mist and / or solution can be passed and circulated close path.

6. The blower (4) acts to absorb the humidity from the humidifier (3) and blow the atomized mist into the pipe to the growing chamber (5). The suitable characteristic of the blower with pressure is 1000 mmH2O to 10 mH2O where the blower fan has either waterproof or non waterproof. The most suitable characteristic of blower fan is the waterproof.

7. The characteristic of tank of humidifier (302) is strong, durability, resistant to the force of the blower (4), where the tank does not collapse or change shape, easy to clean and resistant to corrosion The suitable materials, is polyvinyl chloride, polyethylene, stainless steel 316L. The most suitable materials is stainless steel 316L.

8. The humidity generator (301) serves to change the state of the solution in the tank of humidifier (302) into the atomized mist. The suitable equipment is ultrasonic humidifier, ultrasonic head, which pays higher frequencies than sound frequencies. The solution can be evaporated to the atomized mist without heat. The optimum length of frequency is 0.5-8 MHz. The most optimum frequency is 1-7 MHz. The size of atomized mist size is 2-8 microns, which is the ideal size for growing plants. The optimum size of atomized mist for planting is 3-7 microns and the optimum size of atomized mist for mushroom and moss growing size is 2-8 microns.

9. The characteristic of pipe is path of the atomized mist and / or solution be easy to clean, resistant to corrosion and suitable for internal temperature. The suitable material is polyvinyl chloride, polyethylene, stainless steel 316L, stainless steel 304 and stainless steel 308. The most suitable material qualify as corrosion-resistant, lightweight, cheap, is polyvinyl chloride.

10. At the close path, for some path of the atomized mist and / or solution such that connected the humidifier (3) and the growing chamber (5) whereas at least one path through the blower (4). At least 2 path or more in the closed path must be connected the humidifier (3) and the growing chamber (5) wherein at least one path through the blower (4).

11. Blower (4) can be integrated into the internal component of the humidifier (3).

Cultivation of plants in this invention includes moss mushroom as well.

The present invention includes the application to keep up the root cuttings and in the growing chamber (5), is the boundary of the present invention.

Claims

1. Humidifier cultivation apparatus comprising

a special design of pipe (6) defining path for atomized mist and / or a solution flow to a drain tank (7) and blower (4) that has for some, a point that looks like crap and a hole.

2. Humidifier cultivation apparatus comprising

a special design of pipe (6) defining a path for atomized mist and / or a solution flow to a drain tank (7) and blower (4) that has for some, a point that looks like crap and a hole, wherein the path is a closed path for the atomized mist and/or the solution and comprises at least four vertexes defined by a storage tank (1), a humidifier (3), a growing chamber (5) and a drain tank (7) and wherein the definition of 'closed path' is the one adopted in graph theory, mathematics.

3. The apparatus in accordance with claim 1 or claim 2, wherein the special design pipe (6) has the suitable designations and is similar to the letters U, J, W and the letter J backwards.

4. The apparatus in accordance with claim 1 or claim 2, wherein the pipe (6) shall be considered for the pressure of the pipe in the vicinity of the boiler blower (4) and the pipe near the drain tank (7), the suitable pressure in the drain tank (7) being less than the pressure in the blower (4) area.

5. The apparatus in accordance with claim 1 or claim 2, wherein the pipe that has the special design pipe (6) is connected next to the blower (4) such that count from the atomized mist path from the humidifier (3) or the same area as the blower installation, and bring the atomized mist and / or solution that sticks to the blower (4), in the boundary to the pipe which has the special design pipe (6).

6. The apparatus in accordance with claim 1 or claim 2, wherein the special design pipe (6) is also a component of the passage for the flow of the atomized mist and / or solution between the drain tank (7) and the growing chamber (5).

7. The apparatus in accordance with claim 1 or claim 2, wherein the any device can be added to the closed path (which includes the storage tank (1), the humidifier (3), the growing chamber (5) and the drain tank (7)), such that the device can be connected to each path between the storage tank (1), the humidifier (3), the growing chamber (5) and the drain tank (7), where the atomized mist and / or solution can be passed and circulated.

8. The apparatus in accordance with claim 1 or claim 2, wherein a solution in the storage tank (1) is adapted to flow through the pump (2) to the humidifier (3) and the solution is adapted to volatile to form an atomized mist which can enter into the blower (4), the blower (4) being adapted to draw the atomized mist and blow it through the passage and wherein the passage has two pipes, the first pipe being connected to the growing chamber (5), the atomized mist providing the humidity in the growing chamber (5), the condensation of the atomized mist becoming a solution, which flows through the pipe back into the humidifier (3) again to enable the recycle of the solution to occur; and the second pipe of the blower (4) being connected to the drain tank (7) through the special design pipe (6), the drain tank (7) acting as the solution storage when the solution and the atomize mist enter the drain tank (7), they accumulate to a required level which activates a switch (701) and (702) to transmit a signal to drain the solution, level in the drain tank (7) when the required level is the maximum level, the switch (701) sending the signal to a pump (703), which is adapted to carry the solution in pipe through the storage tank (1) again to be recycled, and when the solution level of the drain tank (7) decreases to the lowest level, the switch (702) is adapted to transmit a signal to the pump (703) to stop working.

9. The apparatus in accordance with claim 1 or claim 2, wherein the pipe is adapted to carry the solution from the storage tank (1) through the pump (2) and to the humidifier (3) connected to a solenoid valve (305), before the solution goes into the tank of humidifier (302) that stores the solution with maximum and minimum scales for the volume of solution in the tank, the humidifier being adapted to evaporate the solution to form the atomized mist that flows in the pipe connected to the blower (4) which is installed outside the humidifier (3), the tank of humidifier (302) having a pipe that is connected to the growing chamber (5) adapted to draw the atomized mist to the growing chamber (5), and the path has no blower to carry the solution in the growing chamber (5) back to the tank of the humidifier (302).

10. The apparatus in accordance with any one of claims 1-2, 4,5, and 8 and 9, wherein the pressure of blower (4) is 1000 mmH2O to 10 mH2O where the blower fan is either waterproof or non-waterproof.

11. The apparatus in accordance with claim 9 wherein the tank of the humidifier (302) is so adapted as to not readily collapse or change shape, is easy to clean, and is resistant to corrosion, and is made from polyvinyl chloride, polyethylene or stainless steel 316L.

12. The apparatus in accordance with claim 9 or claim 11, wherein the humidity generator (301) which serves to change the state of the solution in the tank of humidifier (302) into the atomized mist is an ultrasonic humidifier or ultrasonic head.

13. The apparatus in accordance with claim 12 wherein the humidity generator (301) has the optimum length of frequency is 0.5-8 MHz and optimum length of the atomized mist size is 2-8 microns.

14. The apparatus in accordance with any one of claim 1-9 wherein path or pipe is a passage of cough.

15. The apparatus in accordance with claim 1 or claim 2, wherein at the close path, for some 2 path of the atomize mist and / or solution such that connected the humidifier (3) and the growing chamber (5) whereas at least one path through the blower (4) or that is at least 2 path or more in the closed path must be connected the humidifier (3) and the growing chamber (5) wherein at least one path through the blower (4).

16. The apparatus in accordance with claim 1 or claim 2, wherein the growing chamber (5) has a cavity with entrance of atomize mist and / or solution at least one passage and has plants or roots or both of them.

17. The apparatus in accordance with claim 16 wherein plants which are to be used include moss, mushroom and root cuttings.

18. The apparatus in accordance with any one of claim 1-4 wherein the special design pipe (6) is relatively narrow and contains an open valve and close valve which change the direction current and also comprises a flux meter for pressure monitoring.

19. The apparatus in accordance with any one of claim 1-4 and 18 wherein the special design pipe (6) has the suitable designations that are similar to the letters U, J, W and the letter J backwards.

20. The apparatus in accordance with claim 8 or claim 9, wherein the solenoid valves (305), switches (701) and (702) act as transmitters associated with the solution level.

21. The apparatus in accordance with any one of claim 1-11, or 15, wherein the blower (4) can be integrated into the internal component of the humidifier (3).