Breathing Roots Technology

Title of the field patent	Date of filing	Application Number	Current Status
AN SYSTEM FOR SMART TECHNOLOGY ENABLED BIODEGRADABLE PLANT POT THAT MONITORS AND FILTERS INDOOR AIR	26/04/2019	201911016760	Published. Objection successfully Defended (Grant Stage)

Abstract:

Exposure to indoor air pollution is one of the major sources of health risks in fast-developing countries such as India. Indoor air pollutants from indoor fuel-burning lead to serious human health problems, such as pneumonia, bronchitis, cancer, heart disease, and asthma. Currently, there are many indoor air purification devices on the market; however, these devices (e.g. mechanical 3 filters, electronic air cleaners, ion generators, etc.) focus on the removal of airborne particulates only. It is also known that certain house plants support complex biological and bacterial processes within the plant, and also, within the growth medium surrounding the plant roots, all of which tend to biodegrade various airborne pollutants, especially airborne hydrocarbons and VOCs. The present invention relates to smart technology-enabled biodegradable plant pot that monitors and filters indoor air.

Background:

For any industry or household main source of transportation are vehicles, vehicles are one of the major causes of air pollution as it uses fossil fuels and emits CO2 and other gases. As demand for modernization is increasing day by day therefore more plants are being set up to overcome the problem of air pollution. Indoor air pollution is when pollutants including criteria pollutants (e.g. PM, SO2, NO2, CO), and those made up of gases, vapours, and particles consisting of formaldehyde, volatile organic compounds (VOCs), radon, asbestos, and biological allergens contaminate the indoors. Indoor air pollution has been ranked among the top 10 health risk factors in developing countries which therefore has a high need of indoor air quality management emphasizing sustainability.

Novelty:

The invention relates to a system and method of smart technology-enabled biodegradable plant pot that monitors and filters indoor air. In particular, the device is designed with an air impeller system such that external ‘dirty’ air is circulated within the device in the proximity of the plant, soil, roots, and/or water reservoir, thereby removing impurities, toxins and other undesirable chemicals from the air.

The present invention includes a biodegradable chassis, a smart IoT technology core, a spectrum air filtration, and a fan unit. The biodegradable chassis is designed to operate as a

double wall vacuum chamber which includes an inner wall and outer wall a plant core, and a water core. The plant core is forming an inner pot of the biodegradable chassis to store plant and soil. The water core is on the base of the plant core and forms a water storage area. The smart IoT technology core is a detachable part that plugs into the plant core below the water core. The fan unit draws clean air out of the plant core through the tunnel between the outer wall and the inner wall, after filtration. the spectrum air filtration includes a plant based biofiltration unit, a specialized soil matrix, and a mechanical filtration unit.

In the plant-based biofiltration the air is first funnelled through the phyllosphere (leaf zone) and then the rhizosphere (root zone) in the plant core. The specialized soil matrix is soil composition that is placed inside the plant core through which polluted air passes to get filtered. The Specialized soil matrix consisting of an artificial lattice structure allows for increased porosity of the soil substrate. Herein, the soil substrate mix is based on a unique mix of growth media and mycobacterial species to increase the efficacy of the air filtration process.

The Mechanical filtration unit consisting of activated carbon filters, prefilter, photocatalytic filter, and HEPA filters are used before the final exhaust of the air through the pot. The smart IoT technology core includes a LED display unit, an air quality control unit, a plant health control unit, an airflow control unit, and a communication unit.

The present invention provides an indoor plant-based air purification system to clean the air from harmful air pollutants with the lowest maintenance cost. This invention is readily applicable to several applications including household, industrial uses. It serves not only a functional but an aesthetic purpose as well. The present invention also overcome the deficiencies of existing inventions like controlling the indoor air condition and humidity as well. This invention is operationally effective, cost-effective, reliable and easy to operate and does not lead to any emission or pollution. It provides whole spectrum air filtration and maintains plant health and does not have any geographical limitations.

Direct Link for Patent