

Solar Outdoor Air Purifier with Mobile Charging Portable Station.

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Abstract - Air pollution has become a serious problem these modern days. Air pollution is present outside in the environment and has become difficult to provide safety inside the house. This polluted air can cause many serious health problems in cities. If someone is suffering from breathing problems like Asthma or Sinus or suffering from any lung problem then air-purifier acts as a surviving tool. Air purifier reduces the chances of health issues caused by indoor pollutants, which directly trigger neurological problems, respiratory infection or symptoms in asthma suffering. Hence, the fabrication of a low-cost solar-powered air-purifier made using a HEPA filter, Activated Carbon Filter, Solar Panel, and some miscellaneous components that can become a low-cost but efficient alternative for surviving in such difficult times. This air purifier uses various processes like filtering large dirt particles on the first pre-filter, then capturing dust particles and smoke molecules at the HEPA-filter, and uses Carbon-filter to capture microparticles produces clean purified air. The analysis and results conclude that the Air Purifier can produce 96 percent of clean air and can run up to 14 hours a day by a solar-powered system.

Key Words: Air pollution, HEPA filter, IOT, Carbon filter, Solar.

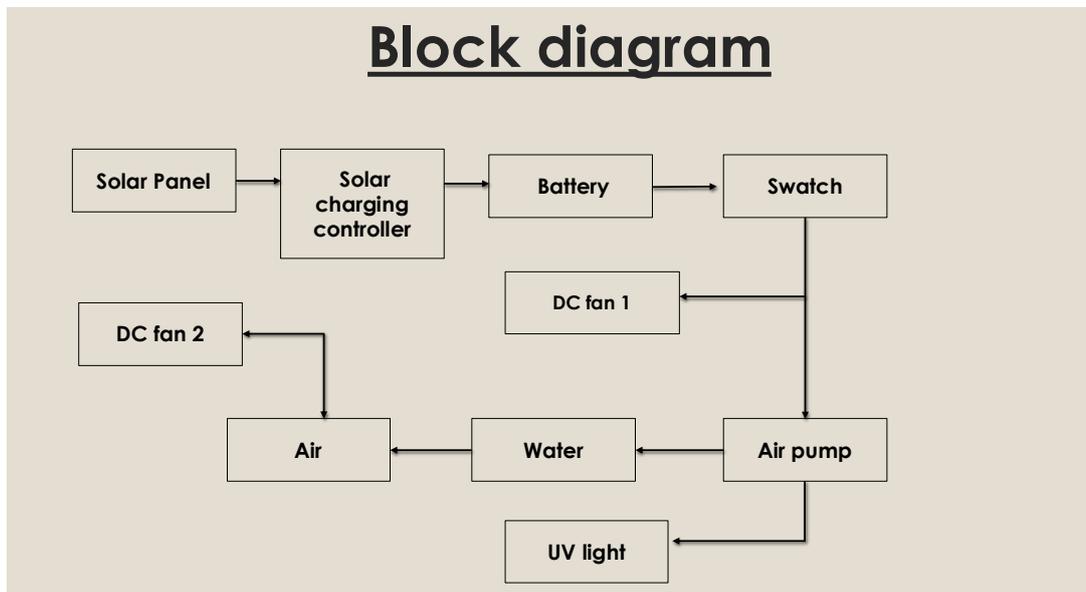
1.INTRODUCTION

An air purifier is a device which removes all air pollutants from the air and it is used for improving air quality index. Air purifier made using HEPA filter, Activated Carbon Filter and some miscellaneous components that can become an efficient alternative for surviving in such difficult times. This air purifier uses various processes like filtering large dirt particles on the first pre-filter, then capturing dust particles and smoke molecules at the HEPA-filter, uses Carbon-filter for capturing micro-particles, and hence produces clean purified air. After the Industrial Revolution, air pollution has become a serious problem and has become a major concern in today's world. Many reports published by various organizations stated that 4.21 million individuals died prematurely in 2012 as a result of air pollution. So, we have to work upon this major crisis. In spite of the fact that there are many types of air purifiers that are available in the market, none of them is working on solar energy with good efficiency.

2. Problem Statement

Air pollution has become a serious problem these modern days. Air pollution is present outside in the environment and has become difficult to provide safety inside the house. This polluted air can cause many serious health problems in cities. Due to this people are suffering from breathing problems like Asthma, Sinus, suffering from any lung problem.

3. System Design



The solar panel converts sunlight into electrical energy and sends it to the charging controller, which charges the battery safely. The stored energy powers the fan, air pump, and UV light. The fan pulls polluted air into the purifier. The air pump then pushes the air through water, where dust and harmful particles get trapped in the water. After that, the air passes through UV light, which kills bacteria and microorganisms. Finally, clean air is released back into the environment.

3. CONCLUSIONS

The Solar Powered Air Purifier using water filtration is an effective and eco-friendly solution to reduce air pollution. By using solar energy, the system operates without relying on conventional electricity. The water filtration method removes dust and impurities, while UV light kills harmful microorganisms. This project demonstrates a sustainable approach to improving air quality using renewable energy and simple purification techniques.

4. Objective

- To design a solar powered air purification system.
- To clean polluted air using a water filtration method.
- To reduce harmful dust particles and microorganisms in the air.
- To use renewable solar energy for environmental protection.
- To create a low-cost and eco-friendly air purifier.

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