A Novel Device for Eliminating Airborne Pathogens

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The purpose of the experiment was to develop a small, light, and affordable battery operated or outlet operable device requiring little maintenance and capable of effectively eliminating airborne pathogens. It was predicted that there would be no significant difference between the constructed device and NASA's Airocide Air Purifier in terms of the percentage of pathogens they eliminated but there would be in terms of their costs and sizes. The device designed includes four unique and potent methods of eliminating pathogens: heat, electric current, ultraviolet (UV) light, and activated carbon. These were targeted at air pushed into and out of the purifier via a rotating fan. The entire device was built from acrylic plastic, a material capable of preventing any UV radiation from exiting the device and thus keeping patients, staff, and bypassers safe. A bacterial counter measured the number of airborne bacteria before and after the device was activated to find the percentage effectiveness of the device. The amount of space the device took up was found by measuring its volume in cubic inches. The cost was found by adding up the costs of the individual materials used to construct the device. These three quantities were compared to the existing Airocide Air Purifier's data which was found on its website and, using p-values of 0.05, the data gathered was found to support the student researcher's hypotheses. There was no significant difference in terms of effectiveness, although there was in terms of cost and size. The final percentage of effectiveness, cost, and size of the created purifier were 99.81%, $33.24 and 97.5 cubic inches compared to Airocide's 99.97%, $800 and 774.18 cubic inches, respectively.

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