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(31) Priority Document No	:NA	(72)Name of Inventor : 1)Ekta Thakur 2)Satyajit Anand 3)Rajneesh Talwar 4)Manvinder Sharma
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(57) Abstract :

A respiratory mask for airborne disease monitoring and health risk prediction, comprising a wearable mask 101 to cover at least a nose and mouth region of a user, a plurality of biosensors 105 to continuously monitor respiratory rate, airflow, oxygen concentration, carbon dioxide concentration, volatile organic compounds, and airborne biological particles, a plurality of internal cavities 107 to receive non-woven filtration layer 109 for filtering finer airborne particles, a Scott Russell arrangement 108 to dynamically deploy or adjust the filter, a pair of fan cartridges 110 to actively regulate airflow through the mask 101, a pathogen detection module to capture and analyze inhaled air for viruses, bacteria, and other airborne pathogens in real time, and a UV-C light module to disinfect internal surface, and an internal filter to filter incoming air when the fan is inactive.

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