Reusable Adsorption Cabin Air Filtration System

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PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20240131463	04/25/2024	2022-899

FULL DESCRIPTION

Background

Drivers and passengers inside vehicle cabins are exposed to high concentration of air pollutants that cause adverse health effects. Estimates suggest that in-vehicle micro-environment contributes approximately 10-15% of people's daily exposure to ultra fine particles and harmful gases such as nitrous oxide (NO), carbon monoxide (CO) and other volatile organic compounds (VOCs). Current cabin air filters aim to reduce penetration of particulate matter only. In charcoal sprayed cabin air filters, the amount of charcoal is not enough to make any significant reduction of VOCs generating in and/or penetrating into the vehicle cabin.

Technology

Prof. Heejung Jung and his co-inventor have developed a novel, reusable cabin air filtration system that reduces both particulate matter as well as VOCs and reactive gases such as ozone (O_3) and NO. The filter uses an activated carbon adsorbent in a packed bed housing. Since gases and VOCs will eventually saturate the sorption layer, the invention also provides the ability for renewing the removable adsorption layer via regeneration using steam or other inexpensive methods.

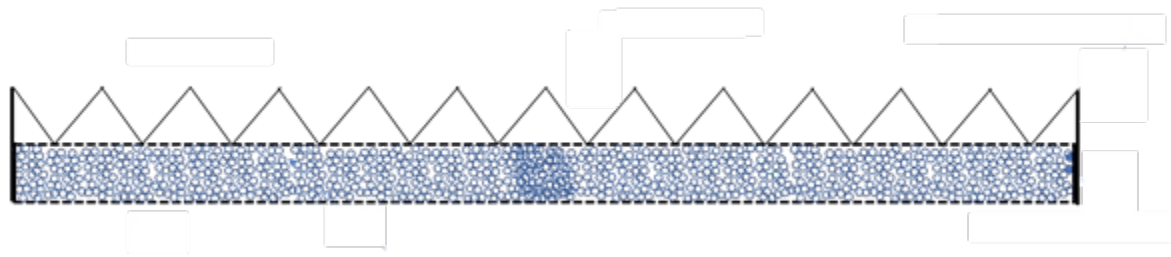

Illustration of the new reusable cabin air filtration system

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OTHER INFORMATION

KEYWORDS

activated carbon, carbon monoxide, CO, NOx, particulates, cabin filter, VOCs

CATEGORIZED AS

- **Environment**
  - Other
- **Transportation**
  - Automotive
  - Other
  - Personal

RELATED CASES

2022-899-0

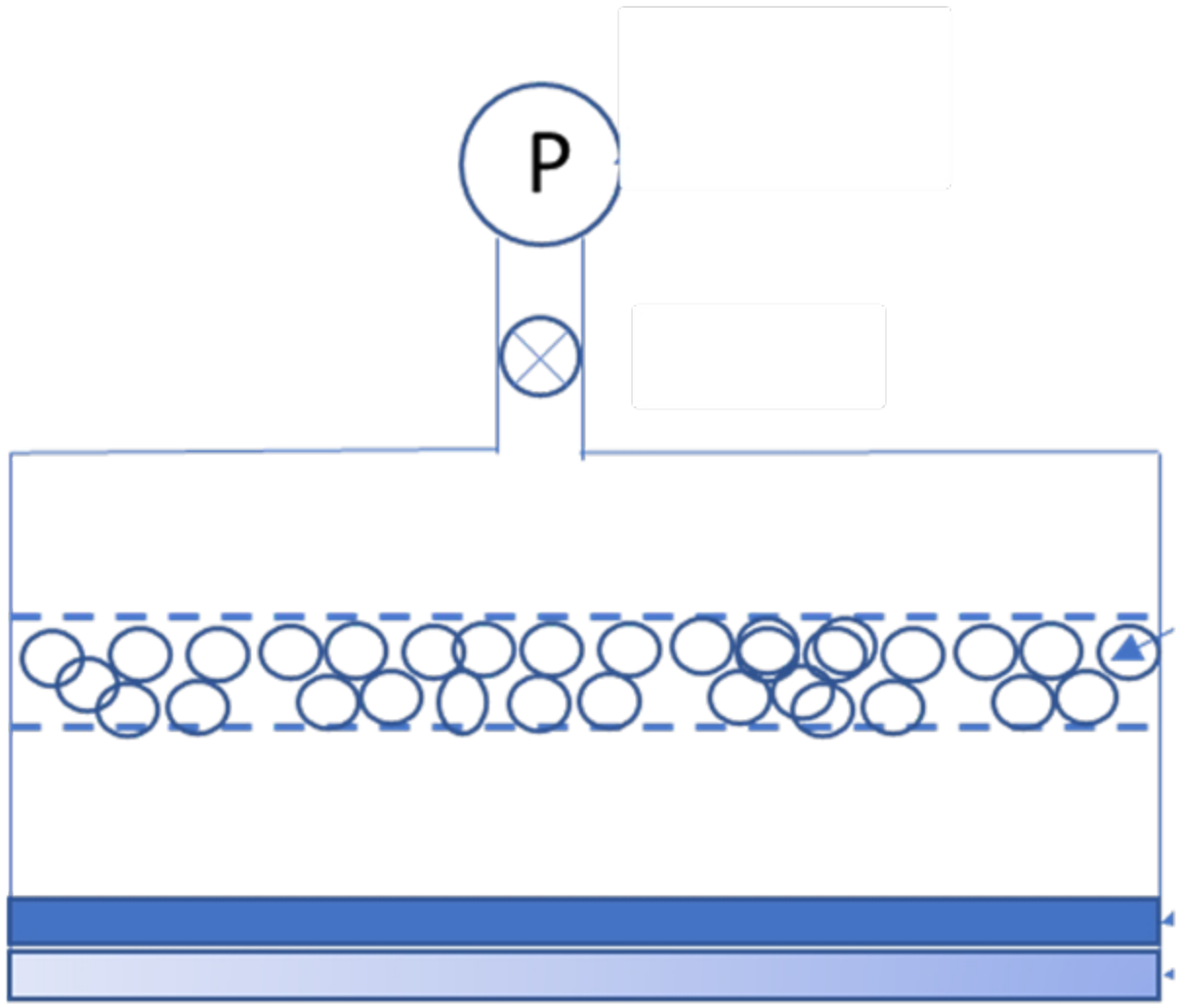

Illustration of the adsorption layer regeneration system.

ADVANTAGES

- The modular design allows for the particulate filter and the adsorbent layer to be separated for easy replacement and/or regeneration.
- The filter removes both particulates and harmful gases such as NO, O_3 and VOCs.
- The filtration system can be integrated into either an aftermarket product (for existing cabin air filters) or into new cabin air filter designs.

SUGGESTED USES

Reusable in-cabin air filtration systems for:

- Passenger cars
- Medium and heavy duty vehicles
- Construction and mining equipment

INVENTOR INFORMATION

- Please learn more about Prof. Jung's research.
- Please read recent news coverage about Prof. Jung at UCR.

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