



Road Dust Collector System

IITM Technology Available for Licensing

Problem Statement and Unmet Need

- **Transport infrastructure** such as roads are **prone** to large amount of **dust particles** which are mostly **fine** in nature and may **damage** internal organs if breathed in through air.
- To **remove road dust deposit**, conventional method is to **collect** dust/waste from roads **manually**, but that causes **resuspension** resulting in high Particulate Matter(**PM**) **concentration** rise in the local air environment.
- Alternatively, a few **devices** with **power intensive** or complex collection mechanism are used, but said devices are **expensive** & also may not be accessed in all places.
- Hence there is a need to introduce a **low cost, simple** in the construction & **sustainable** technology that helps in improving the life quality and can be produced in a decentralized market. This patent discusses a **tricycle-based dust** collector that addresses all the above mentioned issues.

Technology Category/ Market

Technologies: Machines, Mechanical equipment's

Category: Environment Engineering

Applications: Waste management, management of dust emissions from the road

Market: The global dust control systems market size as **\$14,735.0 million** in **2021**, and is projected to reach **\$21,164.7 million** by **2031**, marking a **CAGR** of **3.8%** from **2022** to **2031**.

Technology

- In the present invention, a **road dust collector device** mounted on a wheeled assembly and a **method of collecting dust** using the device thereof is provided.
- The **Device** consists of a set of **six cyclone separators** mounted on a **tricycle (FIG 2)**.
- The **tricycle-based dust collector** works on mechanical agitation created by rotation of the **self-adjusting brush assembly** which adjusts its height according to the **variation** in **altitude** so that it do not leave surface contact from road.

- This may happen due to the **slope variation & road roughness change**.
- The device is configured to sweep dust from a surface using a **sweeping arrangement**, that includes a **plurality of rotatable self-adjustable brush assemblies** that is configured to pick up dust by mechanical agitation created by rotation of the self-adjusting brush assembly that adjusts height via a **spring-loaded link mechanism**, suck the dust into a cyclone separator and separate the dust particles from the clean air.
- It ensures that there is always a **negative pressure** created with in the enclosure which is covered on sides using rubber flaps so that the agitated dust particles do not escape out of it.

Key Features / Value Proposition

- **Simple mechanism** of agitation & suction using a **low power consuming fans** attached at cyclone separators outlet; making **technology sustainable**.
- Useful in **dust management** and **control** of dust emission from the road, resulting in **low PM concentration management** in the local environment.
- **Cheaper** in price in terms of Simple construction & easy operation and affordable.

Intellectual Property

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TRL (Technology Readiness Level)

TRL- **3/4** Proof of concept ready Stage

Research Lab

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Images

FIG 1: Depicts a cyclone separator.

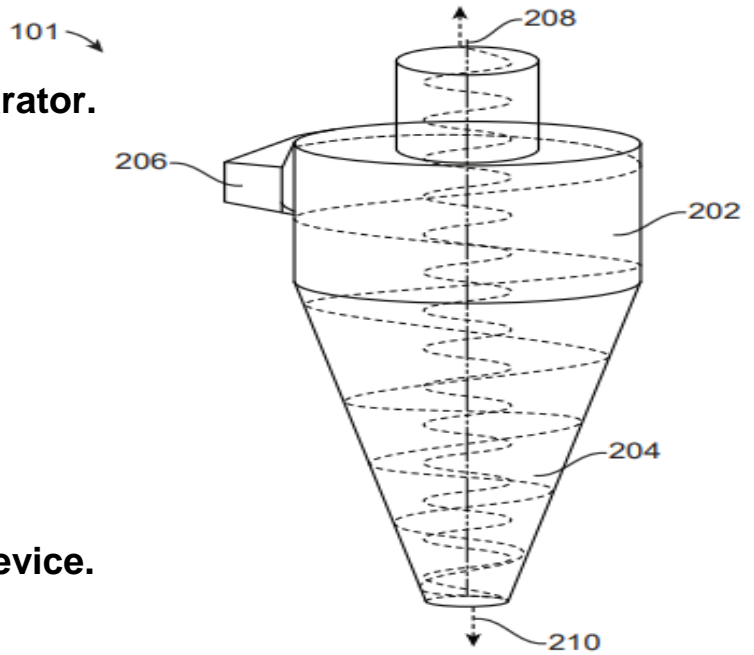
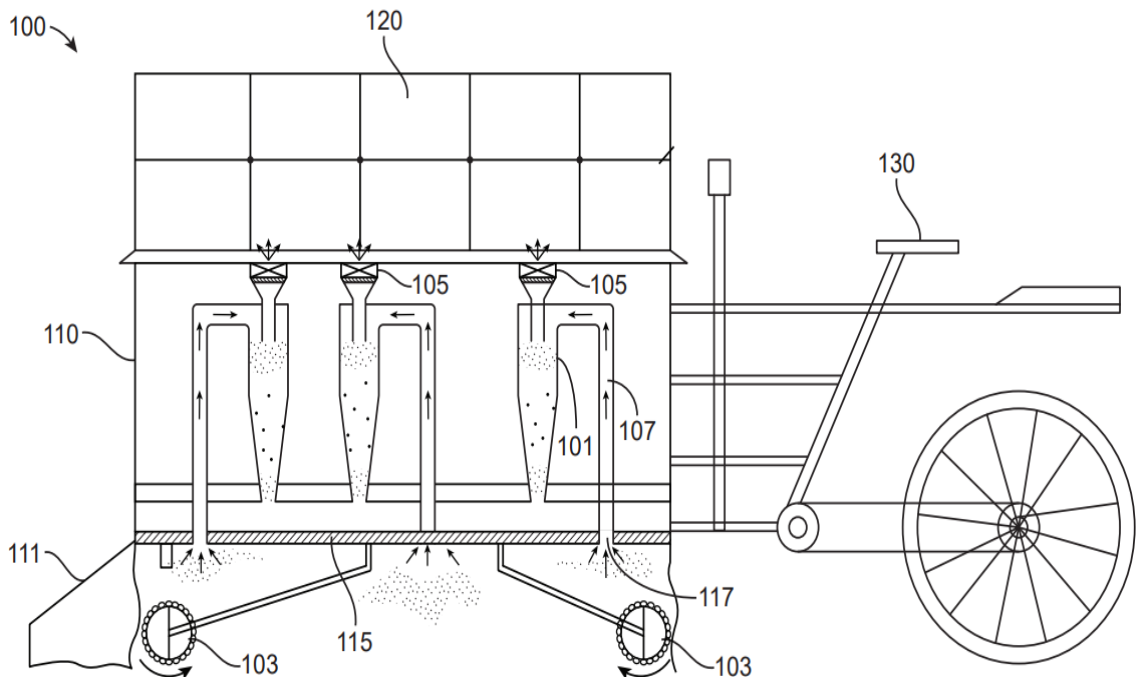


FIG: 2 Shows a side view of a tricycle based dust collector device.



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