



A CLEANING DEVICE

IITM Technology Available for Licensing

Problem Statement

- In the present era, a cleaning equipment is used for domestic & commercial appliances, However, the effectively cleaning of the **inner compartments** of said equipment remains a **challenge**.
- Conventional cleaning equipment can only remove fine particles, requiring frequent cleaning. Moreover, conventional methods cause **blockages & shorten the equipment's lifespan**, & also **cleaning ventilation ducts & inner cavities is difficult** due to accumulated dust & grease.
- Conventional methods yield **poor results & leading to infrequent cleaning**.
- Present subject matter addresses above issues in efficient manner.

Technology Category/ Market

Technology: Cleaning Device

Industry : Domestic & home appliances.

Applications: Domestic use, Guesthouses, Hotels, HVAC, DUCT manufactures, etc.

Market: The global **household cleaning products** market is projected to grow to **\$379.76 billion** in **2032** at a **CAGR** of **4.4%** during the forecast period (**2024-2032**)

Intellectual Property

IITM IDF Ref. 2519;

IN Patent No. 531404 (Granted)

TRL (Technology Readiness Level)

TRL-4, Proof of Concept ready, tested and validated in Laboratory

Research Lab/NSS Activities

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Prof. Pijush Ghosh;

Dept. of Applied Mechanics & Biomedical Engg.

Technology

- Present invention claimed a **cleaning device**, comprises :
- a **head** provided at a top portion of the cleaning device and being **capable of moving telescopically along a first axis (A-A)**. (Refer Fig. 2-PTO)
- A **motor casing** is defined with an inlet passage & coupled to the head configured to accommodate a motor.
- A **housing** is rotatably coupled to the motor & defines at least one intermediate passage in fluid communication with the inlet passage.
- Also, a **distributor** is rotatably coupled to the housing defining a plurality of fluid pathways in a fluid communication with the intermediate passage wherein the **plurality of fluid pathways** branches radially outward from the first axis (A-A).
- Further, a **plurality of arms** is coupled to the distributor & is rotatable about the first axis.
- The **plurality of arms** are telescopically moveable away from the first axis & each of the plurality of arms are defined with a **spray passage** in fluid communication with one of the plurality of fluid pathways, wherein the plurality of arms are configured **to spray fluid for cleaning**. (Refer Fig. 1)

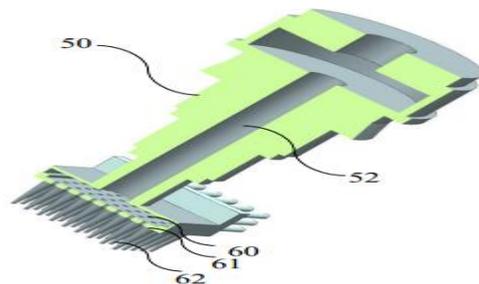


Fig.1 shown a detailed sectional view of **one arm of the plurality of arms** of the cleaning device;

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Key Features / Value Proposition

❖ Technical Perspective:

Different Components:

A) Sensors:

The device comprises a plurality of sensors disposed within the head & the plurality of arms to sense a proximity for cleaning. The plurality of sensors may detect a distance between the surface of the object & the distal end of each arm. This detected distance is considered as an input.

B) Actuator:

The actuator is to selectively adjust the movement of the head & the plurality of arms depending on the sensed proximity.

C) Controller:

The controller is configured to receive the input detected by the plurality of the sensors & actuates the actuator to selectively adjust the length of the head & the plurality of arms via telescopic movement.

D) Remote Operation Monitoring:

A communication module facilitates the interaction of the device with an application installable on a computing device, through which an operation of the device may be configured and controlled remotely.

Improved Performance:

- Enhance the overall **performance**.
- The device includes minimum number of components & therefore is **economical** for manufacturing and maintenance.

Experimental Results:

The controller may restrict supply of fluid to only at least one spray passage of the plurality of arms, thus **decreasing wastage** of the fluid.

❖ Industrial Perspective:

Utility:

- Device is simple and easy to use, universally applicable in **Domestic & Home appliances** also **large duct cleaning process** (e.g. HVAC).

Images

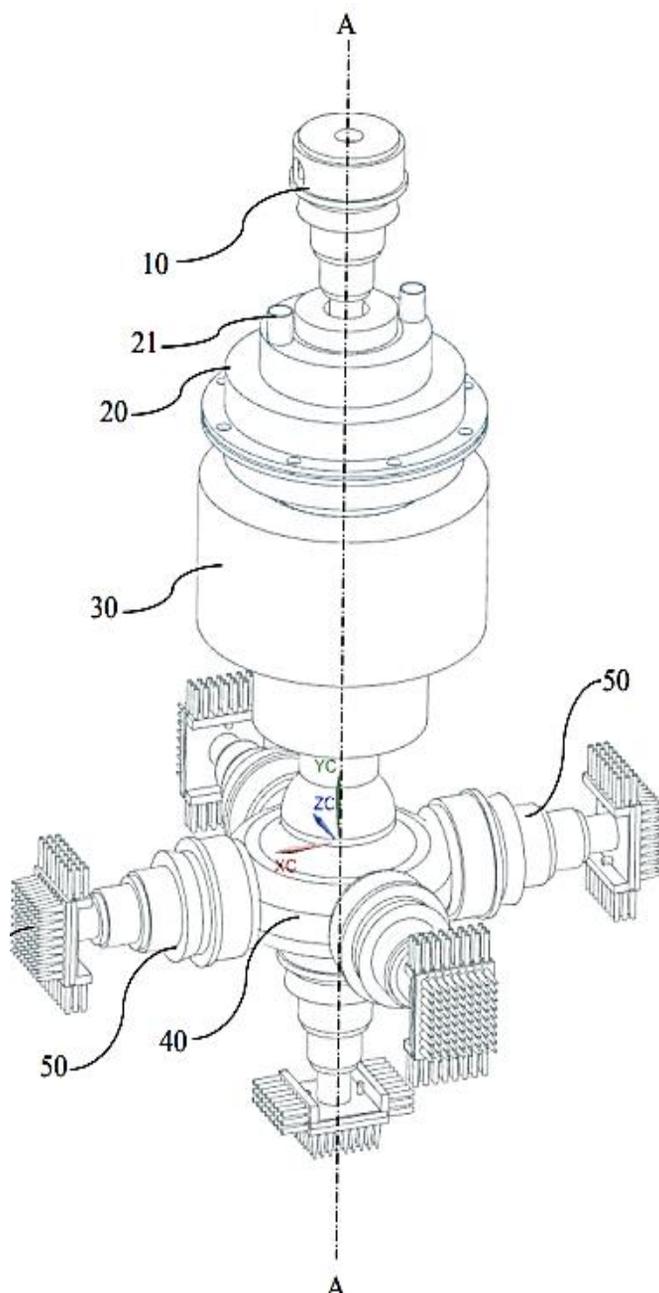


FIG.2(above): Illustrates a perspective view of a cleaning device

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