LINEAR AND ROTARY DISPLACEMENT SENSOR

IITM Technology Available for Licensing

Problem Statement

- Traditionally, linear and angular displacements are measured using potentiometric, capacitive, inductive, magnetic or optical methods.
- Said sensors or sensing techniques are used to measure either angle or displacement i.e., suitable measurement of a single variable (angular/linear displacement) at a time.
- Those sensors have mechanical and physical limitations that will prevent them from being rotated and translated at the same time.
- In this instance, a few prior arts are discussed, however said prior arts do not provide solutions of said issues.
- Hence, there is a requirement to address the above issues efficiently.

Technology Category/ Market

Electrical Engineering: Capacitive displacement sensor**; Industry:** Capacitive Sensor;
Applications: Robotics, Industrial and automotive applications;
Market: The global **capacitive sensor** market size is expected to reach the value **of USD 87.89 billion** by **2029**, at a **CAGR of 15.6%** during forecast period 2022 to **2029**.

Technology

- Present Patent literature talks about **capacitive displacement sensor** capable of performing linear as well as angular displacement measurement.
- The sensor includes an electrically **conductive cylindrical shaft** configured to move linearly along its axis and rotate about it as well.
- Further, a **semi-cylindrical shell** is attached to the **center** of the **cylindrical shaft**.
- An electrode assembly made of two pairs of **semi-cylindrical shells** surrounds the central shaft symmetrically.
- By measuring the electrode capacitances and performing simple calculations, the displacements can be estimated.

Images

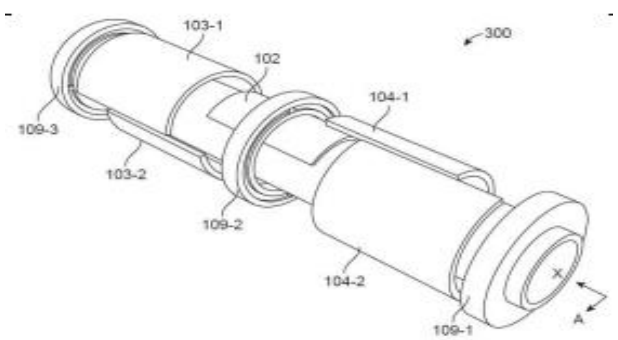

FIG.1: Illustrates exploded view of **capacitive sensor**

Intellectual Property

IITM IDF Ref. 1480
Patent No: 418645 (Granted)

Key Features / Value Proposition

❖ ***Technical Perspective:***

1. Claimed Patent subject matter teaches the simultaneous measurement of linear and angular displacement.

❖ ***Industrial Perspective:***

1. The device resolution for linear displacement is 18µm or lower.
2. The device resolution for angular displacement is 0.06° or lower.

TRL (Technology Readiness Level)

TRL- 3, Proof of Concept Ready Stage

Research Lab

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