



Industrial Consultancy & Sponsored Research (IC&SR)

A VERSATILE HYBRID ROBOTIC SYSTEM FOR MULTIMODAL LOCOMOTION AND GRASPING

IITM Technology Available for Licensing

Problem Statement

- In the present era, typical mobile manipulator have **limited manipulation** capability due to **task specific** end effectors & **limited locomotion ability** due to **lack of maneuverability**.
- A robot with **dexterous manipulation capability** alone would **not be sufficient** to handle a wide range of tasks.
- There are a few conventional patents & non-patent literatures discussed herein by adding a few preliminary elements like end-effector including other mechanism, however unable to meet the criteria like **to handle unfamiliar situations & overcome obstacles**, robot should have multimodal locomotion capabilities.
- Instant Patent addressed above issues in efficient manner.

Technology Category/ Market

Technology: Hybrid robotic system for multimodal locomotion and grasping;
Industry: Pipe Inspections (In/Out pipe), Transportation, Assembly;
Applications: pipe inspection(in/outer), object centric assembling, transportation;
Market: The global **Robotics** market is projected to reach **\$45.09Bn** by **2028**, growing at a CAGR of **3.83%** during the period (**2023-2028**).

Technology

- Present Patent claimed a **robotic system, a hybrid grasper assembly**, & a **method** of operating a robot.
- Proposed Patent describes a multipurpose robotic platform capable of **grasping, manipulation, locomotion**.
- Said robotic system is **hybrid** hand-leg-track-wheeled multipurpose system that includes an articulated arm having two open ends & a hybrid robotic platform connected to each end of the articulated arm.

Image

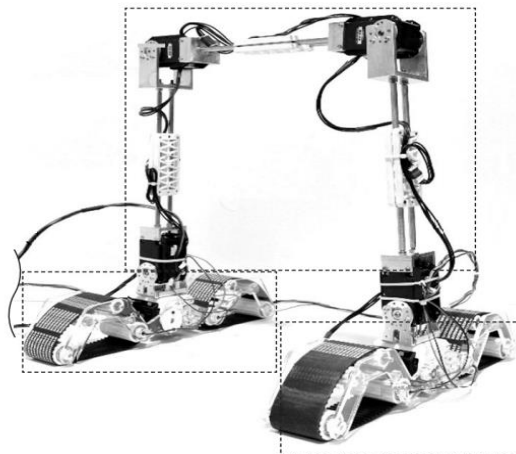


Fig.1: Illustrates the prototype of robotic system

Key Features / Value Proposition

- ❖ **Technical Perspective:** Said patent disclosed to perform **multiple modes of grasping with or without shape conformation**, within-hand manipulation and contact force manipulation.
- ❖ Supports **4 degree of freedom (DOF)**.
- ❖ **Industrial Perspective:** The robotic system can be applied in **in-pipe inspection, outer pipe inspection, object centric assembling, transportation & flexible manufacturing**.

Intellectual Property

IITM IDF Ref. 1621;
Patent No:432862 (Granted);

TRL (Technology Readiness Level)

TRL- 3/4, Proof of Concept ready & validated

Research Lab

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