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विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY
सत्यमेव जयते

BITS Pilani
TECHNOLOGY
ENABLING
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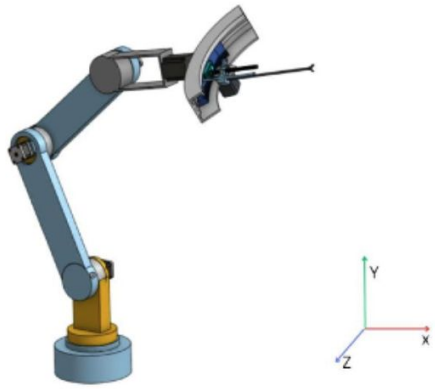
PENDING

(IN202411096073)
A mechanism for producing tilting and rotational motion in robotic arm



NEED

Robotic arms today face 35% downtime due to complex motion mechanisms and limited tool versatility, causing $3B in annual production losses globally. Industries demand simple, durable systems that deliver precise motion without frequent failures or expensive repairs.

TECHNOLOGY OVERVIEW

This innovative robotic arm mechanism uses a three-motor system controlling tilting, rotating, and linear tool movement. A circular rack, pinion gear, and lead screw work together to achieve high flexibility and accuracy, supporting multiple tools like surgical, manufacturing, and assembling devices.

TECHNOLOGY KEY FEATURES

Three-motor control for full motion, circular rack with integrated wiring, lead screw-driven tool carrier, modular detachable design, supports multiple tool types, minimal mechanical complexity for better maintenance and higher operation uptime.

Read more here

MARKET ANALYSIS

The global industrial robotics market is projected to grow at 10.2% CAGR, reaching $128 billion by 2033 (source: Precedence Research, 2024). The Indian robotics market grows at 13% CAGR, driven by smart manufacturing and healthcare robotics trends (source: IMARC Group, 2024).

Target Industries

Industrial Automation, Healthcare Robotics, Electronics Manufacturing. , Robotic system integrators, automation component manufacturers, medical device robotics developers. Go-to-market through partnerships with OEMs, robotic retrofitters, and precision tooling service providers.

AT A GLANCE

- SDG 9 (Industry, Innovation and Infrastructure), SDG 3 (Good Health and Well-being), SDG 8 (Decent Work and Economic Growth)

Technology is available for licensing/ co-development.

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