

LICENSING OPPORTUNITY: A SMART SENSOR FOR PRECISE ALIGNMENT

DESCRIPTION

Problem

Traditional mechanical positioning systems often suffer from misalignment issues, leading to errors in operation. Over the lifetime of a robot workcell, elements degrade, and their positioning may become less precise and the relative position between elements in repeated tasks may drift. To maintain precision, maintenance is required on robots and may come in the form of replacement of components or recalibration of systems. To maximize efficiency of a manufacturing or other automated operation, maintenance should be optimized. Therefore, there is a need to measure and track degradation of positioning precision.

Invention

This invention is a position verification sensor designed to determine the accuracy of mechanical positioning between a key and a receiver pad. The sensor includes a substratum, housing, receiver pad, and aperture cap to ensure precise alignment. It produces a target output when in contact with the key and a null output when the key is absent. This allows for accurate verification of positioning in mechanical systems. The design improves reliability in applications requiring precise alignment.

BENEFITS

Commercial Application

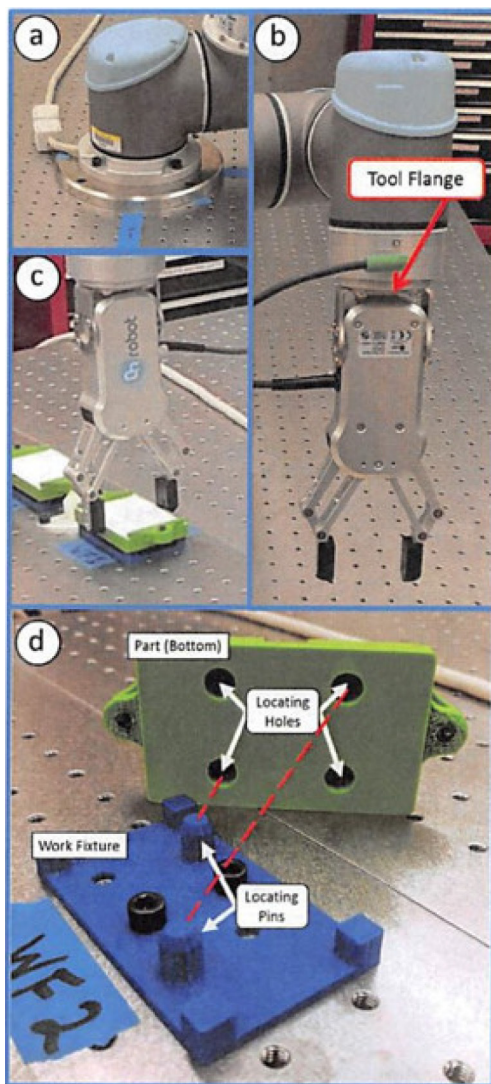
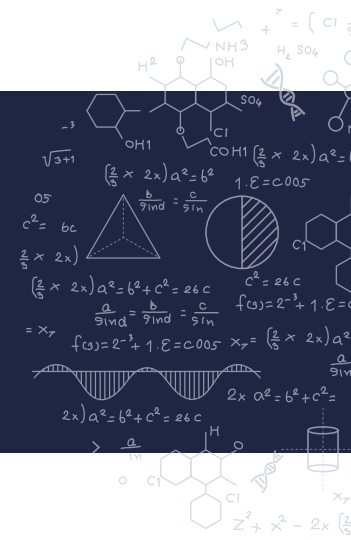
This sensor can be used in manufacturing automation, ensuring precise alignment of components. It is valuable in robotics, where accurate positioning is critical for smooth operation. The technology can be applied in security systems, verifying the correct placement of keys or access mechanisms. It has potential in medical devices, ensuring proper alignment of surgical tools or equipment. Additionally, it can be integrated into automotive systems for position verification in mechanical parts.

Competitive Advantage

This invention offers higher accuracy compared to traditional mechanical positioning methods. It provides real-time verification, reducing errors and improving efficiency. The sensor is compact and adaptable, making it suitable for various industries. It enhances system reliability, minimizing downtime due to misalignment issues. The discrete output feature ensures clear and precise feedback, making it superior to conventional solutions.

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Depiction of NIST use case material handling robot relationships: (a) robot base to the table, (b) robot to tool flange to gripper mounting, (c) gripper fingers to part when on fixture, (d) fixture to table.

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