Underconstraint Eliminator Mechanism in Double Parallelogram Linear Flexure Bearing
Technology #16131

Applications

This invention is used in both macro- and micro- scale applications such as precision machinery and MEMS (Micro Electro Mechanical Systems) devices.

Problem Addressed

Existing Underconstraint Eliminating(UE) flexure bearings presents a range of disadvantages such as asymmetry, static and dynamic performance losses, increased bearing footprint, parasitic kinematic error, and design coupling. Therefore, there is a need for an improved UE Flexure Bearing that addresses these drawbacks.

Technology

The invention is an improved deformable Underconstraint Eliminating (UE) linkage for removing underconstraint in a double parallelogram (DP) linear flexural mechanism. The nested linkage design is shown through analysis and experiment to work as predicted in selectively eliminating the underconstrained degrees of freedom (DOF) in linear flexure bearings. The improvements in this new linkage design will enable wider adoption of underconstraint eliminating (UE) linkages, especially in the design of linear flexural bearings.

Advantages

- Reduced static and dynamic performance losses
- Smaller footprints
- Improved resonance frequency

Categories For This Invention:

Materials
Micro & Nanotech
MEMS/NEMS (Materials)

Intellectual Property:

Underconstraint eliminator mechanism in double parallelogram linear flexure bearing
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Publications:
Eliminating Underconstraint in Double Parallelogram Flexure Mechanisms
Journal of Mechanical Design
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External Links:
Precision Compliant Systems Laboratory
https://lmp.mit.edu/research/micro-and-nano-scale-manufacturing

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