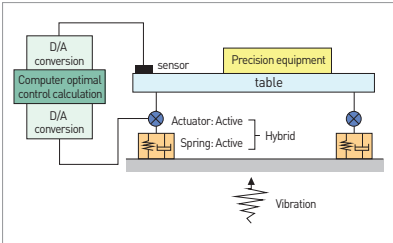


Hybrid Mount System Technology for Improvement of Vibration Reduction Performance

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⇒ Technology to design and fabricate a novel mount system by integrating a controllable actuator to enhance the performance of the mount installed under an apparatus for vibration reduction

Client / Market

- Vibration proof mount manufacturer, manufacturer of device requiring low noise and low vibration, defense industry, precision machinery industry, aerospace industry, etc.

Necessity of this Technology

- Passive mount that is currently in use has satisfactory vibration reducing performance, but a special industries demand development of a new mount with vibration reduction performance improved by 10 dB or higher.
- A newly developed technology needs to reflect dynamic properties of active elements that could improve the vibration reduction capability by 10 dB or higher compared to existing mount while combining with passive elements.
- To develop a new mount demanded by the market, a technology to integrate existing passive mount with an actuator that allows various controls is needed. However, the passive mount and the actuator have their own dynamic properties that the design and fabrication technology to be developed needs to accurately grasp them and create a mount that could realize the characteristics the market demands.

Technical Differentiation

- A low-noise, low-vibration high-value added apparatus can be developed, and a product for the defense market that demands special functions can also be developed.
- A new product that can fulfill the vibration limit condition of micro/nano-devices can be developed.
- This technology is appropriate for customized products rather than ready-made products, and added-value can be increased with it.
- Equipped with technology to develop optimized products that could fulfill various requirements.
- Compared to competing technologies, it is considered superior in terms of cost.

Excellence of Technology

- A mount installed under an equipment supports the dead load of the equipment and protects the equipment from external vibration to support the equipment to perform its original function.
- Along with advancement of industries, development of a mount with better vibration proof or shock resistant performance is required, and there is an increasing demand for a hybrid mount that combines the passive mount and the active actuator.
- A hybrid mount that combines the passive air spring with a piezoelectric actuator, an electromagnetic actuator or a pneumatic control actuator has been attempted.

DESIRED PARTNERSHIP

Technology Transfer

Licensing

Joint Research

Other



TECHNOLOGY READINESS LEVEL [TRL]



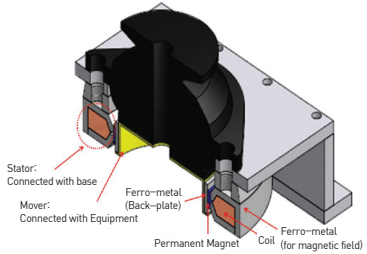
- In the automobile industry, a hybrid mount that combines a passive rubber mount with an electromagnetic actuator or MR/ER-compatible fluidic actuator is being developed.
- For the field to be applied, different types of hybrid mount need to be developed, and a hybrid mount development technology that considers the characteristics of a passive mount and an active actuator from the design stage is demanded.



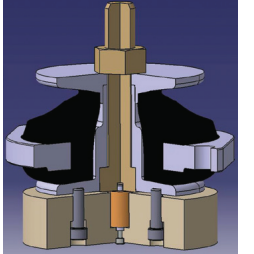
Hybrid Mount for 100 kg Class
(serial, rubber mount + piezoelectric actuator)
A study on the hybrid mount against vibration and shock for naval ships, J. Shock and Vibration, 2010



Hybrid Mount System
(serial, air spring + piezoelectric actuator)
Feasibility study on a hybrid mount system with air springs and piezostack actuators for microvibration control, J. of Intelligent Material System and Structures, 2012



Hybrid Mount for 250 kg Class
(parallel, rubber mount + electromagnetic actuator)
A new mount with moving-magnet type electromagnetic actuator for naval shipboard equipment, Int. J. of Nav. Archit. and Ocean Eng., 2015



Hybrid Mount for 400 kg Class
(inertial mass, rubber mount + piezoelectric actuator)
A inertia-type hybrid mount combining a rubber mount and a piezostack actuator for navel shipboard equipment, Int. J. of Nav. Archit. and Ocean Eng., 2013

Current Intellectual Property Right Status

PATENT

- Vibration Absorbing Device in Type of Active Control (KR1373843, FR12/59138, GB1217352.2, US13/628211)
- Active Control Type Vibration Absorbing Device Having Structure of Magnetic Flux Leakage Reduction (KR1378034)
- Inertia Type Hybrid Mount for Vibration and Shock Suppression (KR1103059)
- Hybrid Electromagnetic Actuator Against Microvibration (KR1084987)
- Vibration Damping Device and Mount System Having the Same (KR1263259)