PYROTECHNIC SHOCK GENERATION SYSTEM AND ASSOCIATED PROCESS

Technological advantages

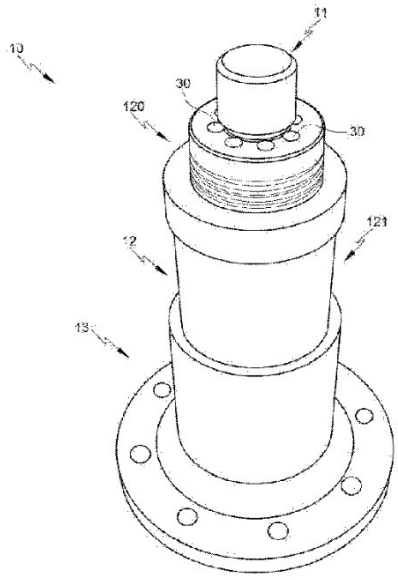
- Simultaneous triggering of multiple pyrotechnic cartridges.
- High-energy shock generation in a controlled manner.
- Modular architecture with single or two-stage percussion.
- Reduced complexity compared to traditional explosive systems.
- Improved repeatability and control of shock testing.

Invention synthesis

This invention relates to a system and method for generating pyrotechnic shocks to test the resistance of equipment, particularly space equipment, to extreme launch environments. The device includes a first percussion stage with a striker featuring an annular lip capable of simultaneously striking multiple pyrotechnic cartridges arranged around a central axis. The gases produced propel an impact element toward a mounting support attached to the surface under test, thereby generating a controlled high-energy shock. An optional second percussion stage, activated by an electromechanical actuator, initiates the first stage using a single cartridge. This system simplifies the reproduction of real pyrotechnic shock events while improving safety, accuracy, and repeatability. It provides an efficient and innovative solution for qualifying sensitive equipment subjected to severe mechanical stress conditions.

Potential applications

- Qualification of space equipment (satellites, launch vehicles).
- Testing of sensitive electronic and mechanical components.
- Simulation of separation or ignition events.
- Extreme environment resistance testing.
- Validation of aerospace or defense structures.



Schematic view of the device

A) Main axis / centerline
1) Pyrotechnic shock generation system
10) Firing stage
11) Striker
12) Barrel
30) Pyrotechnic cartridge
110a) Firing mechanism
120) Muzzle
120a) Cavities

Commercial benefits

- Reduced testing and installation costs.
- Lower risks compared to traditional explosive methods.
- Adaptable solution for various energy levels.
- Improved reliability of certification processes.
- Time savings in qualification campaigns.

Patented invention - under license.

For more information :

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