METHOD FOR SELECTION LOAD CASES BY DIMENSIONALITY REDUCTION FOR DIMENSIONING A REUSABLE SPACE LAUNCHER SYSTEM

Technological advantages

- Reduction in the number of loading cases needed to dimension space launchers.

Invention synthesis

The invention relates to the dimensioning of a space launcher composed of at least one module (M) and of a structure (ST).

The dimensioning of at least one module is done from a set of loading cases in a N-dimensional space. Each loading case is a combination of mechanical force components (general and or local efforts such as for landing gear, engines, aerofins...) applied onto the structure. The set is projected into a hyperplane (with dimension n < N) determined from an analysis into main components of the entire loading cases.

From the dimensioning applied to the structure (thickness), the mass of at least one module can be determined so that the launcher mass can be computed.
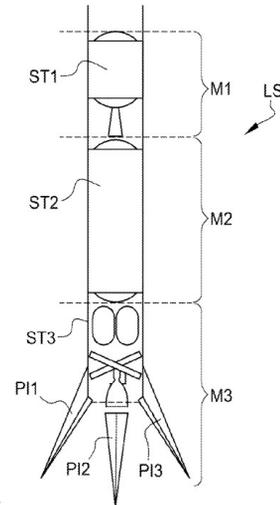
Schematic view

LS) Space launcher
(M1,M2,M3) Modules
(ST1,ST2,ST3) Structure
(PI1,PI2,PI3) Landing legs

Commercial benefits

- Time gain in mechanical studies to dimension space launchers.
- Time gain for evaluating a space launcher mass.

Potential applications

- Dimensioning space launchers, especially suited to reusable space launchers.

Patented invention - under license.

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