IMPROVED DEPLOYMENT DEVICE FOR NANO-SATELLITE

Technological advantages

- **Robust and simplified mechanical set-up**
- **Autonomous system**
- **No pyrotechnic element**
- **Small angular rotational speed**
- **Stable ejection push**

Invention synthesis

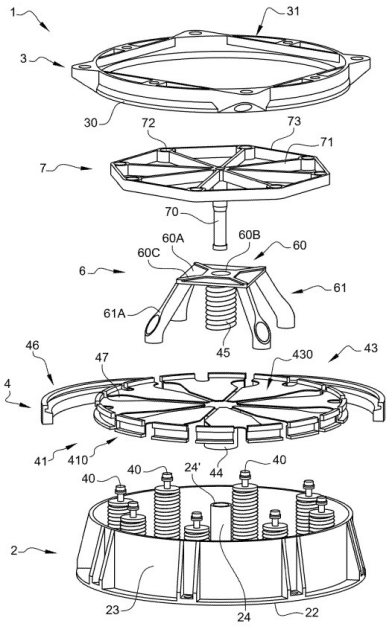
The invention deals with a deployment mechanism suited for nano-satellites.

During deployment, closed type systems based on rectangular containers limit the use of nano-satellites appendices (such as solar panels, antennas…). Other systems based on 2 annular bands (one linked to the launcher, the other to the satellite), although light, create rotational moments and spins (roughly 10 °/s).

The invention proposes the use of a main structure linked to the launcher and a support that can be ejected with the satellite. The locking / unlocking structure is composed of 2 flange elements, radial and/or axial on the support frame. An elastic deformable actuator applies constraints on the set-up for locking and applies a force for ejection when unlocked. A pushing plate with a guiding shaft is located under the ejection frame. This guided plate allows to limit the angular deviation speed and the spin during deployment (of the order of 2 °/s).

Potential applications

- Nano-satellites : scientific missions, telecommunication, observation.



Exploded schematic view for the set-up

(1) Deployment system
(2) Main structure
(3) Support frame
(4) Locking / unlocking structure
(6) Load bearing structure
(7) Pushing plate
(8) Central shaft
(40) Pushing elements
(41) Flange elements
(45) Elastic compression elements for unlocking
(46) Holding elements
(70) Guiding shaft

Commercial benefits

- Robust system, reliable and mechanically simple.
- Reduction in the number of post-ejection operations for nano-satellites (reducing spin during deployment).

Patented invention - under license.

For more information :

Valo-TT@cnes.fr