

DEVICE AND METHOD FOR CONTROLLING A PARALLEL-ARCHITECTURE MECHANISM

Technological advantages

Efficient system:

- Fully controlled trajectories and within the mobile pointing domain.
- Optimized trajectories and faster set-up.
- Use of spherical coordinates, or Cartesians, or parametric.
- Open loop commands, no need for real time solution of complex set of equations.

Invention synthesis

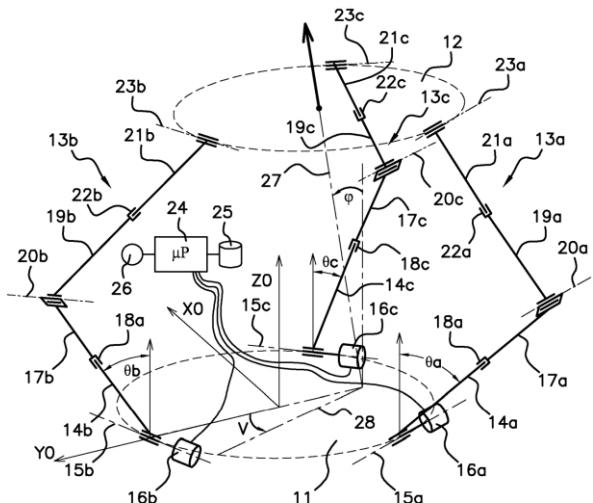
The invention deals with a mechanical system to control a mobile positioning along at least 2 degrees of freedom.

Devices, for example for antenna pointing, are available but do not allow for the trajectory control between the initial and the final states. The trajectory can therefore exceed the pointing domain.

The invention presents a process using an open loop allowing for the control and optimization of the trajectory without the need for a complex computation of a set of equations. The device is made of a base and a mobile, connected through at least 3 mechanical chains. Each chain is made of pivot pins and rigid arms. Rotative actuators on the base allows for the arms displacements. A set of pre-computed tabulated values is created to associate the base angles to the mobile location.

Potential applications

- Any vehicle : satellites, probes, missiles, ships, drones, ...



Principle for the device mechanism

- (11) Base
- (12) Mobile
- (13a,b,c) Cinematic chain
- (14a,b,c) Base rigid arm
- (15a,b,c) Base pivot axis
- (16a,b,c) Base actuator for angle control
- (17a,b,c) Elbow rigid arm
- (18a,b,c) Pivot axis
- (19a,b,c) Forearm rigid arm
- (20a,b,c) Pivot axis
- (21a,b,c) Mobile rigid arm
- (22a,b,c) Pivot axis
- (23a,b,c) Mobile pivot axis

Commercial benefits

- Certified dynamic properties : the mobile trajectories and the displacement time are known in advance.
- Safe no lock-up system : fully controlled trajectories.
- Can be applied to a large set of onboard systems.

Patented invention - under license.