Two degree-of-freedom spherical orienting device

The invention provides a simple rugged two degree-of-freedom spherical orienting device applicable to point payloads such as cameras, mirrors, lasers, antennas and the like. A spherical five-bar mechanism with payload support is actuated by two rotary actuators fixed in position to a base. Advantages of the device include: the preserving of image horizon for cameras (in contrast to three degree-of-freedom devices); the ability to position the payload at the geometric center of rotation thereby reducing inertia; high stiffness enabling orientation of large loads and use of high angular velocities and accelerations; simplification of inverse kinematic computation; relatively large outward workspace (approximating a hemisphere) and large internal free space for payload orienting.