

A Powerless Helical Locking Mechanism for Door

Abstract

A powerless helical locking mechanism for door includes a screw(1) with variable lead angle connected with a power(11) and a self-adaptive nut(19) connected to the door(10), in which, the helical flux of the screw is divided into three segments: one segment is a working segment with the helical lead angle greater than the friction angle, one segment is a closing segment with the helical lead angle smaller than the friction angle, and transition segment between the two segments, the power (11)actuates the screw to corotation and reverse, the self-adaptive nut(19) consists a spindle sleeve(7), a wrist(5) and other part, the nut and the screw is assembled to a helical kinematic-pair, wherein the wrist is dipped into the helical flutes of the screw and line contacts with the flute making the wrist and random helical flute of helical lead angle form mating helical pair to translate power and movement.

Figure 1