

ABSTRACT

Active Elevator Suspension System

A method and apparatus for actively counteracting a disturbing force (14) acting horizontally on a platform (10) moving vertically in a hoistway is disclosed. A manifestation of the disturbing force (10) such as acceleration is sensed (16) and counteracted (26), for example, by effectively adding mass to the platform (10) in proportion to the magnitude of the sensed signal (18). The frequency of the sensed signal (18) may be taken into account. Rotational disturbances or horizontal components or manifestations thereof may also be counteracted. These may be accomplished by using an electromagnetic actuator or spring/solenoid activated wheels (24) for actuating the platform (10) in response to a control signal from a control means (20) which is in turn responsive to the sensed signal (18). Regardless of the actuator (24) selected, it may be used as well to bring the platform (10) to rest with respect to a hoistway sill prior to transferring passengers. The control means (20) may be analog or digital or a combination of both. A preferred analog-digital approach is disclosed in which the digital part is responsive to accelerometer signals, the analog part is responsive to a force command signal from the digital part and provides a position feedback signal in return. In a preferred embodiment, four electromagnetic actuators or two opposed wheel clusters are situated near the bottom of the platform (10). Each electromagnetic actuator may act along a line which intersects the walls of the car at a forty-five degree angle. A single axis embodiment is also disclosed. A plural-bladed rail is also disclosed.

[Fig. 1]