Stair-Climbing Transport Robot

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When school Physic LAB moved to another building, there are several stairs between the two places, so we cannot take the instruments on the handcart Door-to-Door, we must stop and take them upstairs by manpower. A Stair –Climbing Transport Robot which can move cargo up and down the stairs automatically. Has been designed and built. There are commonly four types of stair-climbing robot rolling-3-wheel, crawler, telescopic rod and complex crawler. In the present study, the crawler type will be adopted. The robot is mainly composed of an inclined front of 70 degrees; two road wheel tracks and automatically adjustable platform in which the platform is maintained horizontal to avoid dropping of the cargo during delivery. When the angle sensor detects a non-horizontal plane, the linear actuator will have instant response and maintain the cargo in horizontal position. This device has a compact structure and is able to provide large carrying capacity with smooth and fast movement and is easy to fabricate. An alert light and sound is installed in the robot to allow people nearby beware of the moving device. The stair-climbing robot is able to climb stairs with a maximum of 40 degrees. When moving in ground level, the robot can move at a maximum speed of 1.2 m/s with cargo load of at most 100 kg. Whereas the robot can climb up and down stairs with a maximum speed of 0.2 m/s and load of 60 kg. The robot can be controlled automatically, wired or wireless control. This stair-climbing robot is particular critical in delivery of load in places which cannot use large equipment as well as in places without elevator.

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