

D.A. WANG, D.S. HUANG, M.S. CHIANG, Y.C. LIN. *The lift-up mechanism design of the electric auxiliary seat using the power screw. Gerontechnology 2010;9(2):337;*

doi:10.4017/gt.2010.09.02.188.00 **Purpose** Moving by car is a primary way of people's transportation. For older adults or those with disabilities, easily accessing the vehicle is a significant subject in their daily life. Some vehicles are refitted with assistive equipment to help older adults getting in and out of cars. The electric auxiliary seat is an equipment to help a user boarding the vehicle from the side door¹. Different mechanisms are designed to meet the vehicles' configurations of the chassis height, the door width or the interior space. In this paper we design a lift-up mechanism of the electric auxiliary seat which could provide long span motion and have the seat land on the ground. The electric auxiliary seat functions as an independent wheelchair outside the vehicle. The older adults or those with disabilities would need no transfer from the seat as they get into the vehicle. **Method** The lift-up mechanism, including the seat, is a six-axis-drive equipment. The wheels of the seat can be retracted. For long span motion the power screw is used to drive the lift-up mechanism. Two pairs of parallelogram linkages, where two links are shaped similar to the cam² (Figure 1), dominate the lift-up mechanism span. The power screw and two pairs of parallelogram linkages are jointed by a crank-shaft. When the power screw pushes or pulls the crank-shaft, the parallelogram linkages slide along the linear guides and the link 2 contact with the rollers. The whole mechanism, similar to the motion-generation cam², imparts the linear motion of the power screw to the parallelogram linkages which provide the lift-up mechanism with the general plane motion^{2,3}. Two hooks with specified curve shape on the parallelogram linkages connect with two pins on the seat supporting frame, keeping the seat with horizontal attitude as the lift-up mechanism goes up and down. **Results & Discussion** The prototype of the lift-up mechanism, integrated with the electric auxiliary seat, is built (Figure 2). The span of the lift-up mechanism is enough to fit the configuration of a minivan. The electric auxiliary seat can be released from the lift-up mechanism and functions as an independent wheelchair. The benefit for older adults or those with disabilities is that it is easy to board the vehicle without any transfer. Currently we are working on the mechanism analysis of the original design for improving the prototype.

References

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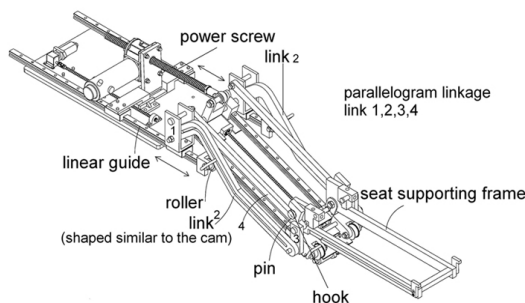


Figure 1. The lift-up mechanism



Figure 2. The prototype of the electric auxiliary seat