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Abstract
This research implements a multifunction walker for aged people, which may function as an exerciser and a recreational walker. The multifunction walker combines the crank-and-slider mechanism of ellipticals and the basic structure of bicycles, so it may be used as a walking assistive device or an exercising facility. It can be used as an indoor elliptical when fixed in place, and a mobility assistive device when in walking mode. The two front wheels and the rear crank wheel form a triangle to prevent it from tilting in walking mode. Particularly, the elliptical mechanism greatly reduces the impact on the user's knees. It's suitable for the old people to do cardiopulmonary exercise, muscular training, and outdoor activities. The conceptual design of the "Multifunction Walker" was divided into three parts: the frame with three wheels, the adjustable elliptical mechanism, and the multifunction steering system of three modes. First, we design a walker of crank-and-slider elliptical mechanism. Then in the concrete design stage, we use the SolidWorks, a CAD/CAE software, in making engineering drawings and full-scale mockup construction. Finally, the prototype was manufactured, assembled, and tested. We knew the prototype's some defects from the test results and made improvements. We thereby design a new type walker of six-bar linkage elliptical mechanism by applying Yan's creative mechanism design method, which carries on the design by six-bar linkage generalized chain. Nine feasible mechanisms were obtained, and we chose one feasible mechanism to proceed the concrete design for vigorous step walking.
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