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Abstract
This research focuses on the design and systematization of an “ Auxiliary Power Unit of wheelchairs ” which can be applied on manual wheelchair to make it a “ perfect wheelchair”. The whole concept is to mantle a extra auxiliary device onto a wheelchair to improve the bad design of its driving system. This research has two originalities: 1. The steering system enables the wheelchair to turm almost on the same spot. 2. The auxiliary unit can retract the wheels easily. The application of a wheel retracting mechanism which is in charge of the retraction of the power wheels and steering handle is the key point of this design. The purpose of this design is to enable the user to switch between the electric and manual mode. However, there is neither related products and researches, nor documents about design methods and theory about such mechanism. Thus, based on the concept of the retract mechanism of airplane, the design in this research is systematized through creative design process. The developed methods in this research can not only solve the problems of designing retract mechanism for wheelchairs, but also help to develop new devices for Wheelchair.The achievements in this research can bring following attributions. On one hand this research will provide systematic design methods for the Auxiliary Power Unit and retract mechanism for wheelchairs. On the other hand, the developed auxiliary unit with retract mechanism is an original concept which can not only met the needs of users but also improve their living quality and competitiveness. This is of practical value. Furthermore, due to its explicit excellent functions, this unit can be easy introduced into the market, which in turn can enhance the competitive ability of wheelchair manufacturers in Taiwan.
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