‘Aider’: A Modular Addition to Transform a Manual Wheelchair into a Power Wheelchair

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Objective
To design, fabricate and test an affordable add-on module to transform a manual wheelchair into a power wheelchair.

Target Users
• Nursing home residents who can safely and independently operate a power wheelchair but cannot afford one.
• Manual wheelchair users who may desire but do not qualify for a power chair.

Benefits
• Nursing Home Staff: reduced staff burden to push residents throughout facility
• Nursing Home Residents: Increased independence and mobility
• Community-Dwellers: Periodic powered mobility for extended travel

Features
• Frame: Attaches to and disassembles from standard manual wheelchair without tools
• In-hub Motor: Uses rare earth magnets, 50Nm maximum torque
• Wheel: 7.5” diameter
• Controller: Pulse-width-modular control with self-diagnostic functionality

The Aider provides independent mobility without the added costs and constraints of a power chair.

The Aider frame attaches directly to a manual wheelchair without any tools or additional hardware.

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• Runs off of 2–12AH, 12V batteries, 31 miles per charge
• Weighs only 6.6lbs without batteries
• Uses low cost components and electronics (Wheel, motor, and controller components total $300)

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