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(57) Abstract :

A wearable support device for fall prevention and mobility assistance comprising a body 101 to fit around a user's waist with an adjustable strap 102 that automatically adjusts using an embedded ultrasonic sensor, an imaging unit 103 with a processor to analyse facial expressions and detect walking difficulty, a microcontroller that actuates L-shaped telescopic rods 104 with motorized wheels 105 for ground contact, a motion sensor to detect user movement and regulate wheels 105 actuation, a sensing module to detect fall and deploy multi-hinged extendable links 106 to assist leg movement, stabilizing panels 107 attached via hinge joint 108 to support back, a Near-Infrared Spectroscopy sensor to identify pain causes, a motorized roller 109 with a Peltier unit for targeted heat massage, an angle sensor to detect body 101 tilt during a fall, and an inflatable tube 115 is deployed to cushion and prevent injury.

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