Novel patient sensing, automated treadmill device to retrain stroke patients for proper walking

- Scheda
- Approfondimenti

Identificativo proposta:TOSG20200102002 **RICHIEDI MAGGIORI INFORMAZIONI**

A Singapore institute has developed a sensing treadmill with automated variable speeds with increased safety features to help retrain post-stroke patients to improve gait and endurance. The institute seeks licensing partnerships with technical assistance with MNEs/SMEs of all sizes.

While stroke patients often suffer long-term disability with walking impairments, their gait can improve with aerobic exercise such as treadmill training. However, using standard treadmills to train stroke patients poses some challenges. Current treadmills have pre-programmed speed control, where the speed remains constant during the course of the exercise but would change at pre-programmed times or when manually directed. They lack automated safe speed progression and are unable to adapt to the slower walking speeds of stroke survivors. This increases the risk of falls, as the typical treadmill does not match exercise regimes to the subject's behaviour, but instead rigidly forces the subject to continue the exercise according to the pre-programmed speeds or times. The Singapore institute has developed a semi-automated treadmill that offers variable automated speed sensing treadmill. The device has incorporated patient automated variable speeds and feedback, as well as features like controls to reposition a fall-prevention harness and variable pre-programmed exercise parameters. Laser beam foot sensors positioned on the belt can detect the subject's foot positions and provides the relevant feedback to the patient. This technology consists of multiple smart controllers (32-bit ARM microcontroller) with proprietary sensors for body position, feet position and exercise algorithms that are developed based on input from clinicians. The tracking process provides continuous adjustment of the exercise program, dynamically customising it to match and also challenge the subject's physical state during the duration of the exercise. This technology is applicable in the following industries: Rehabilitation • Help post-stroke patients recover locomotor and walking function. • Help stroke patients or cardiac patients rebuild endurance Wellness • Build up the fitness of senior individuals who are unable to use normal exercise treadmills due to increased fall risk or very slow walking speeds • Sport performance monitoring as the system can measure some physical measurements such as loading from the harness. • Tracking of feet position and also the left and right body weight The Singapore institute is keen to establish licensing partnerships with MNEs or SMEs of all sizes where the partner could further develop this technology into new products to serve its customer segments.

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