

Wearable robot with perfected control architecture



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PATENT STATUS: Granted

PRIORITY N°: 102017000148580

PRIORITY DATE: 21/12/2017

PUBLISHED AS: IT; PCT; EP

Invention

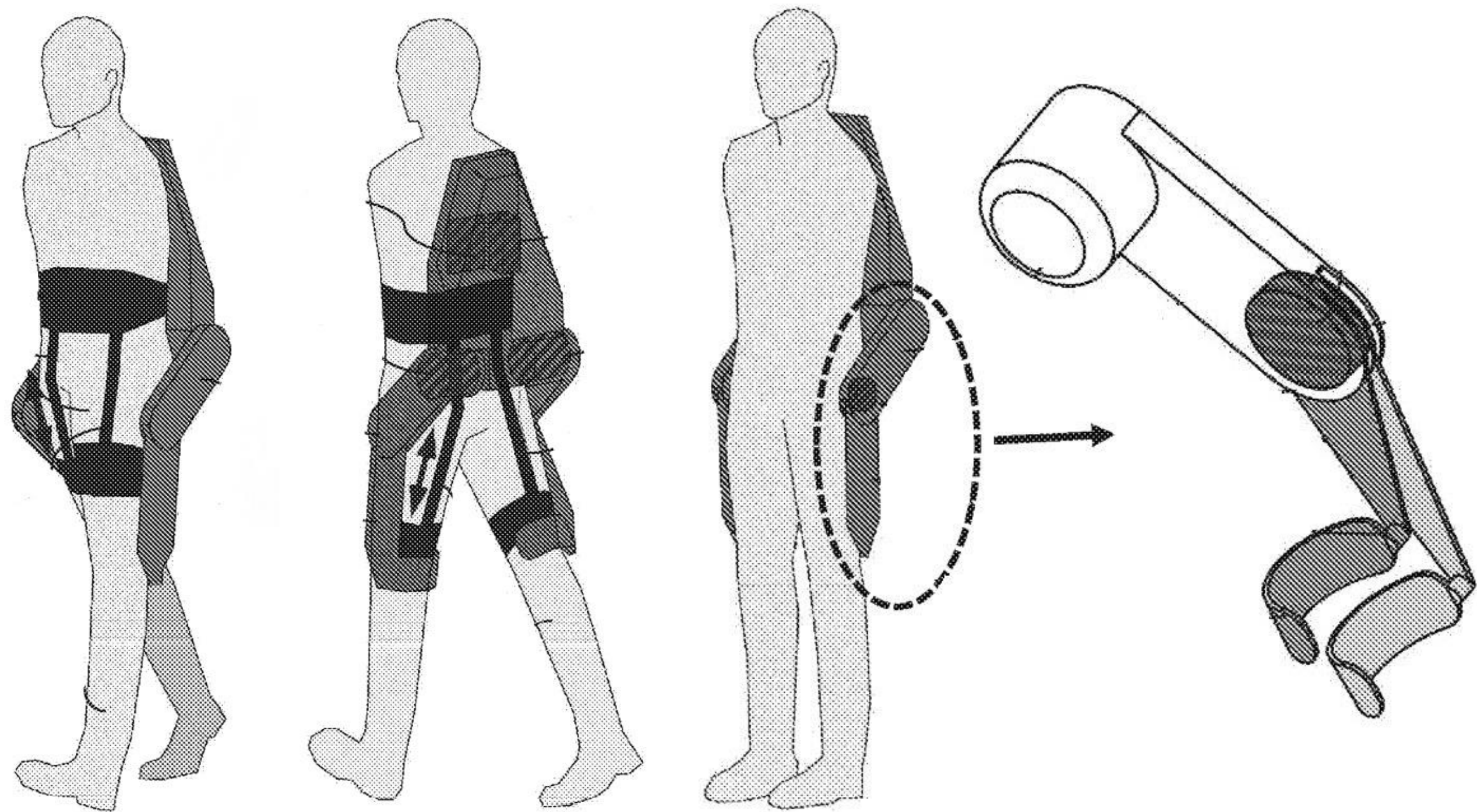


Wearable robotics find application in the assistive sector, e.g. the tasks performed by a care-giver in the daily life of an elderly person; or in the rehabilitation sector. A wearable robot is a mechatronic device that extends, integrates, replaces or improves the function of the limb or joint with which it interfaces. The invention is a mechatronic architecture that supports movement in an intelligent way, storing and processing information coming from the movement itself. A fundamental aspect in an assistance exoskeleton is the integration of an adequate assistive strategy. The system must deliver energy to the person in appropriate phases of the step and with adequate intensity. Real-time adaptability is given by gait monitoring sensors, an adaptive assistive strategy and an appropriate structure to allow effective transfer of mechanical power. The known solutions are affected by the misalignment of the human-robot interface at the level of the robotic joint and the anatomical one (hip), by slipping problems between the robotic segment and the body or viscoelastic interactions. The proposed mechatronic architecture is based on a sensor decoupled from the mechanical action of the robot, so as to provide a reliable measurement of the joint angle even in the presence of viscoelastic coupling between the robotic segment and the body segment, misalignment or slipping.

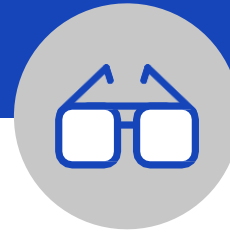
The main advantages are:

- Assistive strategy based on the joint angle that is not affected by the problems generated by a non-ideal physical coupling to the human-robot interface.
- Sensorial joint angle measurement system not integrated into the robotic joint
- No viscoelastic coupling
- High stability and assistance.

Drawings
& pictures



Industrial applications



Applications:

- Assistive robotics
- Robotic rehabilitation
- Orthotics
- Prosthetics

Possible developments



The research group is interested in obtaining industrial collaborations aimed at increasing the technological maturity of the present invention or industrial partners interested in taking the license of the technology object of this patent.

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