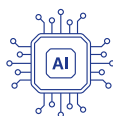


Pandhora®

Infrared Robotic Rehabilitation

Connect
Your
Sense

LIWALK®



EASY TO USE

Robotic Exoskeleton with Thermal Stimulation and AI for Gait Rehabilitation

INTERNATIONAL PATENT PCT/IB2020/055260 EUROPE-USA-CHINA

EUROPEAN PATENT NO. EP3982901

ITALIAN PATENT NO. IT202019000001812

DESIGN REG. NO. 402020000000841-402020000001342

TRADEMARK REG. NO. 302019000053934

About Us: Founded in 2016, Pandhora is a pioneering entity in the field of biomedical technology, specializing in the design, production, and distribution of cutting-edge devices for rehabilitation. Our journey begins with a dream: to revolutionize the world of rehabilitation through robotics, offering solutions that tangibly improve people's lives. At Pandhora, our mission is steadfast: to continually advance innovation in the rehabilitation sector, enriching the lives of millions of people worldwide.

Our Vision: We believe in a future where advanced technology and humanity seamlessly integrate, creating a healthcare ecosystem that is more efficient, accessible, and humane. Our mission is to be architects of this change, working tirelessly to develop innovations that raise the standard of rehabilitative care, making it more effective, efficient, and comfortable for patients.

Experience and Innovation: Our expertise in the fields of robotics and precision mechanics is the foundation upon which we build the future of rehabilitation. Through our deep knowledge in kinematic simulation and robotics, we have brought to life unique devices that are setting the standard for Robotic Rehabilitation. Our multidisciplinary approach, combining engineering and medical skills, enables us to tackle and solve complex challenges,

significantly enhancing the effectiveness of rehabilitative therapy.

Prestigious Collaborations and Research Support: ThankstothesupportofENTOPAN, the largest business incubator in Southern Italy, and backed by CDP Venture Capital as well as prestigious investors such as the Giomi Hospital Group and Santo Versace, we are at the heart of an exceptional network of excellence. This enables us to always be at the forefront of research and innovation projects in the biomedical and engineering sectors, thanks to our team of highly qualified experts.

Prestigious Collaborations and Research Support: ThankstothesupportofENTOPAN, the largest business incubator in Southern Italy, and backed by CDP Venture Capital as well as prestigious investors such as the Giomi Hospital Group and Santo Versace, we are at the heart of an exceptional network of excellence. This enables us to always be at the forefront of research and innovation projects in the biomedical and engineering sectors, thanks to our team of highly qualified experts.

Ph.D. Ing. Stefano Troncone
CEO & Founder

LI-WALK®

Infrared Thermal Stimulation, Robotic Exoskeleton, and Full Sensory Immersion with AI Support and Kinematic Analysis

Li-Walk®, the cutting-edge system that combines advanced technologies to optimize the recovery journey of patients affected by stroke, trauma, and other motor conditions. With a unique combination of robotic exoskeleton and infrared thermal stimulation, Li-Walk® sets a new standard of excellence in rehabilitation. This pioneering device is designed to offer innovative support in lower limb rehabilitation pathways, laying the groundwork for a new direction in treatment and physical recovery.

Device for Walking Training with Infrared Thermal Stimulation and Autonomous AI Learning Capabilities.

Li-Walk® is a robotic exoskeleton, driven by artificial intelligence, primarily used for motor rehabilitation of patients with lower limb disabilities, such as those caused by stroke, spinal cord injuries, or other neurological conditions. This device is crucial for gait therapy as it supports the patient's weight and guides their steps in a controlled and repetitive manner.

The exoskeleton is mounted on a treadmill and features a weight support system that alleviates some of the load from patients, making walking easier even for those with severe motor difficulties. Through the use of sensors and dedicated software,

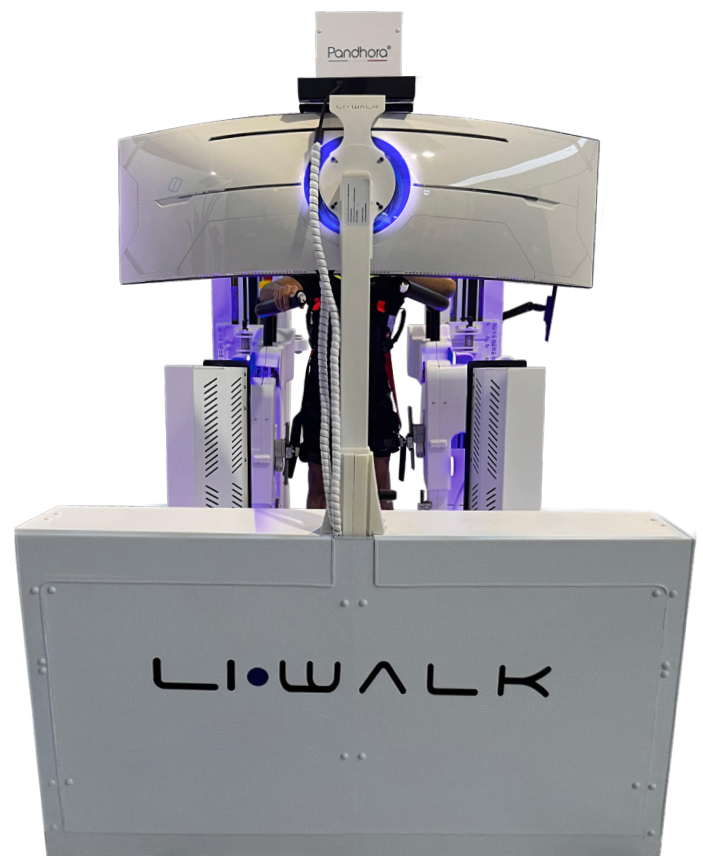
Li-Walk® ensures that leg movements follow a natural walking pattern, which can be customized to meet the specific needs of the patient.

Infrared rays heat and prepare the muscles for exercise, increasing biofeedback and comfort during therapy. Real-life scenarios displayed on a curved monitor stimulate patient motivation, making rehabilitation more engaging.

This type of robotic therapy allows for a high number of step repetitions, crucial for the motor learning process and the improvement of the ability to walk independently.

Innovation and Efficiency: Quick and Customized Connection System in the Rehabilitation Exoskeleton

Li-Walk® is equipped with a fast and advanced connection system, ideal for facilitating adaptation to different patients with maximum efficiency. Leg size adjustments are fully motorized, allowing for quick and precise calibration to accommodate the specific needs of each patient. Additionally, the leg attachment systems are equipped with sliding guides that automatically adjust to the size of the patient's femur and tibia. This mechanism not only reduces preparation time for therapy but also increases patient comfort, ensuring a perfect fit and optimal distribution of support during motor rehabilitation.



Li-Walk®: A Step Forward in Rehabilitation

Li-Walk® stands as an innovative partner in rehabilitation clinics, offering advanced technology that integrates infrared thermal stimulation. This combination represents a new horizon in rehabilitative treatment, aiming to provide optimal support and renewed hope for physical recovery. Li-Walk® is the embodiment of innovation serving the health and well-being of patients.

Infrared Thermal Stimulation

Li-Walk® harnesses the therapeutic power of infrared rays to stimulate cutaneous thermoreceptors, activating the nervous system and promoting neuronal plasticity. This mechanism not only facilitates brain reorganization and restoration of motor functions, essential for patients affected by stroke or trauma, but also offers numerous therapeutic benefits, including muscle relaxation, pain reduction, and improved blood circulation.

Immersive Visual Experience

Thanks to an integrated curved monitor, Li-Walk® provides an engaging visual experience, with real-life scenarios synchronized with the patient's steps. This visualization not only enhances the walking experience but also strengthens the mind-body connection, inspiring confidence and motivation in the rehabilitation journey.

Auditory Stimulation

Every step forward by the patient is accompanied by auditory feedback through integrated subwoofers, providing auditory stimulation that enhances the effectiveness of rehabilitation and makes the experience even more engaging and rewarding.

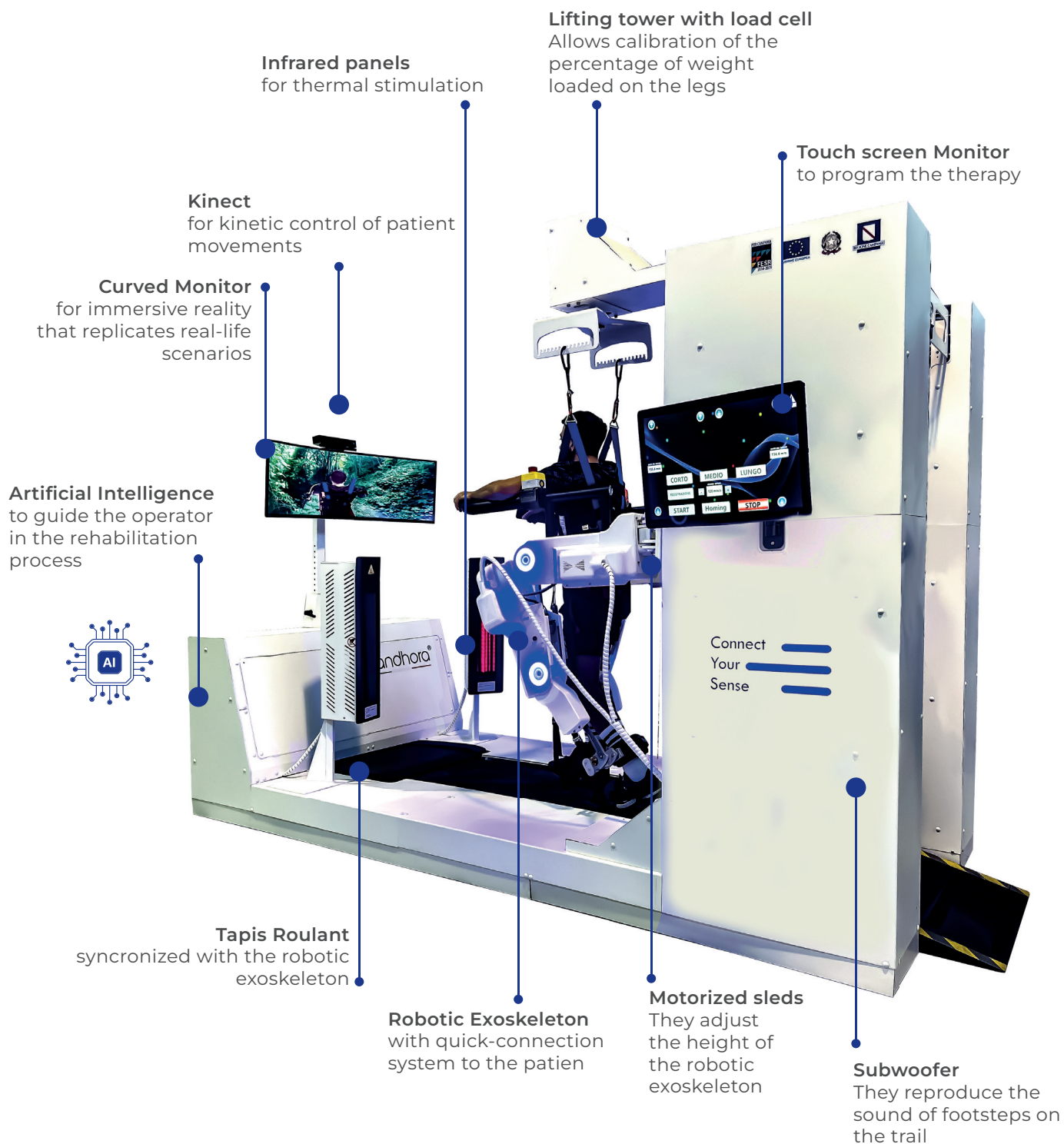
Integrated Artificial Intelligence

With the integration of artificial intelligence algorithms, Li-Walk® suggests personalized therapies to the physiotherapist based on the most effective outcomes observed in similar patients, providing objective insights. The final decision always remains in the hands of the experienced physiotherapist, ensuring a carefully customized approach.

Kinematic Analysis with Kinect

The addition of Kinect enables detailed analysis of the patient's movements, allowing for precise evaluation and more comprehensive interaction, including the ability to perform coordinated exercises between upper and lower limbs.

This device is the result of years of research and development in collaboration with universities and research centers, representing the pinnacle of technology in rehabilitation. Every component is designed to operate in perfect harmony, offering patients the best opportunity for recovery and an extremely engaging rehabilitation experience.



HOW DOES LI-WALK® WORK

BIOFEEDBACK

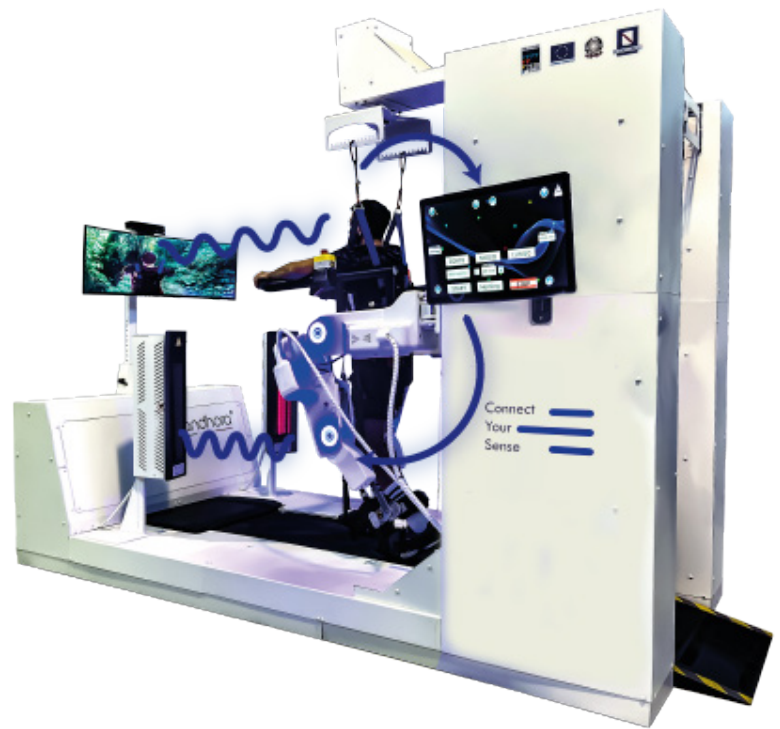
The patient, stimulated by virtual reality and infrared rays, will respond with a variation in the operation of the robotic exoskeleton.

PATIENT PERFORMANCE ANALYSIS

The computer analyzes the biofeedback and sends a command to adapt the operation of the robotic exoskeleton based on the response to the stimuli.

GATE CONTROL INTERACTION

The robotic exoskeleton adjusts operation in real-time based on the patient's response.



Customized Thermal Stimulation Modes

Li-Walk® utilizes three sophisticated modes of infrared thermal stimulation:

Impulsive Stimulation (low residual capacity)

Provides an immediate heat intensity as soon as the patient exerts force, facilitating the initial essential movements in recovery.

Pulsed Stimulation (moderate residual capacity)

Varies the frequency of lamp activation based on the force exerted, ensuring deep heat penetration and optimal muscle warming while allowing the skin time to cool on the surface.

Gradual Stimulation (good residual capacity)

Increases the intensity of infrared rays progressively with the patient's effort, promoting improved muscle control.

These modes of thermal stimulation, along with their therapeutic benefits, are key tools for customizing treatment, offering targeted progression toward optimal recovery.

TECHNICAL SPECIFICATIONS

VOLTAGE CA 220 V 50Hz 3,1 kW	TRAINING SPEED 0.1 ~ 3,5 km/h	INFRARED RAYS Short waves with variable intensity
SPASM MONITORING 3 adjustable levels	WEIGHT SUSPENSION Load adjustment on the legs	CUSTOMIZABLE REHABILITATION PARAMETERS Real-time display of resistance curves
USER SPECIFICATIONS	WEIGHT: Less than 135 kg HEIGHT: Less than 200 cm LEG LENGTH: Femur: 34 ~ 46 cm Shinbone: 30 ~ 40 cm	ARTICULAR MOVEMENT ANGLE: Hip joint: 30 ~ 50 ° Knee joint: 50 ~ 80 °

WHO CAN USE LI-WALK®

Li-Walk® can be used primarily in patients with the following conditions: stroke sequelae, stroke, traumatic brain injuries, paraplegia, cerebral palsy, multiple sclerosis, Parkinson's disease, and orthopedic indications.



SESSION DURATION

Average session time: 25 minutes, with 5 minutes for positioning the patient on Li-Walk and 20 minutes for the session.

- Intensive Therapy: 3 individual training sessions weekly over one month.
- Maintenance Therapy: 2 times a week for 3 weeks, to be repeated during the course of the year.
- Customized Treatments: Depending on patient cooperation and stage of the condition.

The duration of therapy is determined by the attending physician. Prescriptions are validated by specialized personnel following a detailed interview, tests, and patient analysis at the beginning and end of training.

€ SESSION COSTS

- Average cost per session: 100 - 300 €
 - Average package: 20 sessions from 2,000 to 6,000 €
- Costs vary depending on the duration and the rehabilitation center.

Pandhora®

Infrared Robotic Rehabilitation

Via Pizzone, 11/7 - 84085 Mercato San Severino Salerno, Italy
Phone: +39 089 820 15 04 E-mail: info@pandhora.it
www.pandhorarehab.it



Project co-financed by the European Regional Development Fund

