

## SYSTEM FOR INCREASING THE MOBILITY OF ARMS AND HANDS OF A USER

### EXECUTIVE SUMMARY

We offer a device specially designed to improve the quality of life of patients suffering from diseases affecting the nervous system that prevent them from moving their arms correctly.

It increases the mobility of the upper extremities of patients with asymmetric muscular or neurological deficiencies, allowing them to maintain greater independence and functionality in their daily lives.

#### **Key Features:**

- **Mechanical Design:** Uses counterbalance technology and articulated supports to use the capabilities of muscle groups that retain their capacity to compensate for the deficiencies of others. It also allows the prone-supination movement with a simple mechanism.
- **Energy-Independent:** Operates without batteries or external power by redirecting the user's natural strength and utilizing gravity-assisted movements with spring-loaded components.
- **Practical Impact:** Enables patients with conditions like hemiparesis or muscular dystrophy to perform essential daily tasks such as drinking water, eating and reaching objects independently.

This technology restores functional independence and dignity, significantly reducing caregiver dependence while improving patients' quality of life.

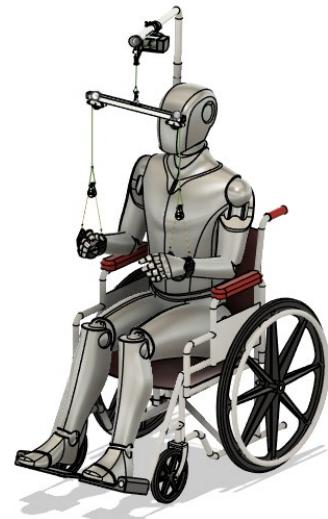
#### Reference TO

2026/001

#### Date of publication

13/01/2026

#### Representative image



### MARKET AND APPLICATIONS

The device is primarily aimed at people with reduced mobility in their upper limbs, offering them greater **control, autonomy, and independence** in their daily activities.

Its design allows for a high degree of **customization**, as it can be easily adjusted to the physical characteristics and functional needs of each user. This adaptability makes it suitable for a wide range of conditions such as **amyotrophic lateral sclerosis (ALS), muscular dystrophies, post-stroke rehabilitation, and other neuromuscular disorders**.

The device addresses a **growing global market**, driven by population aging and the rise of neurological disorders. Unlike robotic exoskeletons, it offers a **cost-effective, easy-to-use, and energy-independent solution**, making it accessible to a much broader audience.

It can also be used in rehabilitation exercises, particularly to perform the pronation-supination movement without the need to support the arm's weight.

The image shows a 3D design of the prototype in its working position, where the different assemblies and functional parts of the system can be clearly identified. It is specifically conceived for integration with a wheelchair without interfering with the user's field of vision.

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#### More technologies

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## TECHNOLOGY DESCRIPTION

This guidance system has been specifically designed to restore and support controlled movements of the upper limbs (lifting and pronation-supination). Its operation is entirely mechanical, energy-independent, and based on gravity and preserved muscle function. The device is simple, affordable, and adaptable to each patient if needed.

The mechanism is composed of three main assemblies:

### PULLEY-BASED ASSISTANCE SYSTEM

- Operates using gravity and the user's residual strength, reducing the effort needed to initiate or complete arm movements.
- Through a multi-pulley configuration, the system redirects the applied force, enabling smoother execution of arm movements with minimal effort.



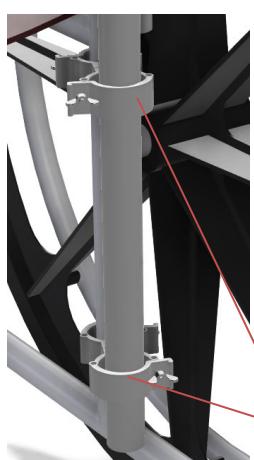
### HORIZONTAL BAR WITH PULLEY SYSTEM

- Contains the motion lock mechanism, which allows to regulate the working height.
- Provides the connection point for the arm support, linking directly with the vertical bar.



### VERTICAL BAR (ADJUSTABLE HEIGHT COLUMN)

- Supplies the necessary elevation of the mechanism to adapt to different users. Also acts as the main support structure, providing stable anchoring to the wheelchair or base system.
- Incorporates height adjustment positions, allowing personalization according to the patient's morphology and functional capacity.
- Fully detachable for transport, ensuring easy portability and storage.



Vertical bar attachment with wheelchair

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## POTENTIAL ADVANTAGES AND INNOVATIONS



### AUTONOMOUS OPERATION

Self-powered system requiring no external power supply, ensuring complete independence and mobility for therapeutic sessions.



### PRECISION MOVEMENT CONTROL

Engineered to enable controlled hand and arm movements with specialized focus on:

- Elevation and prone-supination movements
- Simultaneous displacement capabilities
- Multi-directional rotation functions



### ADAPTIVE HEIGHT SYSTEM

Features an adjustable working height mechanism that provides personalized configuration to meet different tasks to be performed.



### PORTABLE & USER-FRIENDLY DESIGN

- Lightweight construction for easy handling
- Modular detachable components for quick setup
- Simple assembly/disassembly procedure
- Cross-environment compatibility for versatile use, which implies use **in clinical rehabilitation centers and at home**, ensuring flexibility and convenience for patients and therapists.



### DEVELOPMENT STATUS

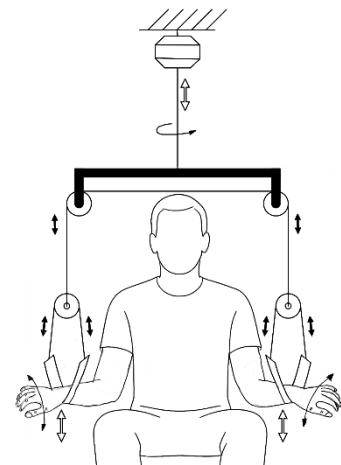
- ✓ A prototype has been already built and is fully functional.

#### Intellectual property status

Patent pending

#### Tags

- Pronosupination of the forearm
- Amyotrophic lateral sclerosis (ALS)
- Assistive technology
- Mechanical support system
- Daily living assistance (ADL)
- Upper limb mobility



#### Business opportunity

- Technology license
- Market advantage
- Commercial exploitation

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