



# 超小形・軽量・安価な補助機器シリーズ⑤ 腕を下から支え追従する上肢補助器

Ultra-compact, lightweight, and reasonable assist device series 5:  
An upper limb device that supports and follows the arm from bottom



## 背景／課題 Background/Problems

- ◆ **背景:** 超高齢社会, コロナ以降も出不精, 脳卒中患者増加, 患者をケアする介助者・労働者・若手不足.
- ◆ **課題1:** 病院・リハ施設での腕を上げにくい患者の動作補助, 介護・工場・農業等各種作業者の負担軽減.
- ◆ **課題2:** モータ等の動力源があると, かさばり, 屋外や浴場, ビニルハウス, 冷凍室等の環境では使用困難.
- Super-aging society, unwillingness to go outside even after the coronavirus, increasing number of stroke patients, lack of workers and young people to care for patients.
- Motion assistance for patients who have difficulty raising their arms in hospitals and rehabilitation facilities,
- Reducing the burden on various workers in nursing care, factories, agriculture, etc.
- If there is a power source such as a motor, it is bulky and difficult to use it outdoors, in bathrooms, vinyl houses, freezers, etc.

## 概要／解決法 Summary/Solutions

- ◆ **概要:** 腕の重さ分の負担を軽減. 腕が角度を変えても追従, 体の側面からはみ出さず他と干渉しない.
- ◆ **解決法:** 遠隔運動中心 (Remote Center of Motion) 機構を用い, 補助したい肩周りには機構がなくても肩関節を中心とした腕を上げる動作に追従, 上腕の下(裏)から持ち上げるよう支持. 電源不要のガススプリング使用.
- Reduces the burden of arm weight. Even if the arm changes its angle, it will follow and will not protrude from the side of the body and will not interfere with others.
- By using a Remote Center of Motion mechanism, even if there is no mechanism around the shoulder, it follows the motion of raising the arm centered around the shoulder joint, and assists from the bottom (back) of the upper arm.
- Uses a gas spring that requires no power supply.

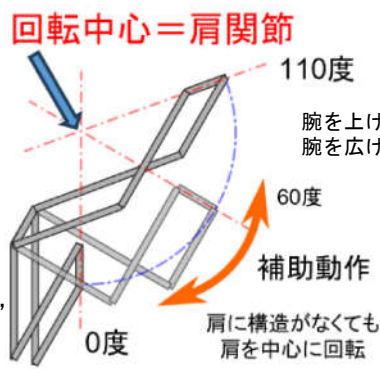
## 優位性 Advantages

- ◆ モータ不使用のため小形・軽量・安価に製作可能.
- ◆ 装着者の正面と側面に機構が来ず, ぶつからない.
- ◆ 健常者3名が装着し, 作業時の筋活動を筋電位の %MVC 平均値にて算出し, 非装着時と比較した結果, 三角筋前部: -38%, 中部: -31%, 後部: -11%を確認.
- Since it does not use a motor, it can be manufactured compactly, lightweight, and inexpensively.
- The mechanism does not come in front of or on the sides of the wearer, preventing collisions with other people or objects.
- The device was worn by three healthy participants, and the muscle activity during work was calculated using the average % MVC of EMG, and the results were compared to without the device: anterior deltoid: -38%, middle: -31%, rear deltoid muscle: -11%.

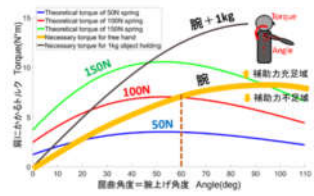
## ターゲット市場／製品 Target Areas/Products

- ◆ 病院・リハビリ施設 (患者の日常生活動作補助用)
- ◆ 介護・工場・農業等各種作業従事者および企業 (作業補助用)
- ◆ 特許出願中.
- Hospitals/rehabilitation facilities (for assisting patients with activities of daily living)
- For nursing care, factories, agriculture, etc. workers and companies (for work assistance)
- Applied for a patent

使用例:  
日常生活  
および  
各種作業に  
使用可能.



腕を上げるだけでなく, 外転: 0~115度  
腕を広げる動作も追従. 屈曲: 0~110度



100Nばね: 腕のトルクカーブに近い  
60度で腕の重さと釣り合う