

A DEVICE ATTACHED TO A HUMAN GARMENT INTENDED TO SUPPORT OR MOVE A PERSON'S UPPER LIMB

PhD.Student Marius Leonard OLAR
 PhD.Habil.Professor Monica LEBA
OSIM nr. A/00813/2021

ABSTRACT

This invention consists of a device for supporting or moving the upper limb of a person with an inability to use this limb. The device works at the shoulder and elbow joint levels to facilitate glenohumeral and forearm movements. This is useful for injuries to the shoulder joint caused by medical conditions, trauma or overuse, which can restrict the movement of the arm and forearm. The device can be used for any arm that has difficulty performing these movements.

RESULTS

On the back of the garment (1) (Figure 2) are:

- the controll system (5),
- the drive system consisting of four m1-m4 shoulder motors (6),
- (two m5-m6 forearm motors (7))
- and cable routes are formed by distributing and fixing on the surface of the medial layer (4),
- some small pulleys (14),
- which guide the cables (8a-13a) to the sockets (8b-13b) located on the arm sleeve (2)
- (and on the forearm sleeve (3)),
- detached from the garment, fixed on the user's arm.

The arm actuation motors work in pairs to execute front-to-back (motors m1 and m3) (Figure 1a) and up-down (motors m2 and m4) (Figure 1b), equivalent to natural movements with:

- rotation on the Y+ axis (V. abduction),
- rotation on the Y- axis (V. adduction),
- rotation on the Z+ axis (H. abduction)
- rotation on the Z- axis (H. adduction).

By continuing these combinations with horizontal-vertical-diagonal movements, the general circumduction movement of the arm (Figure 1c), 360°, on the surface of a cone, at an angle of 60° can be achieved.

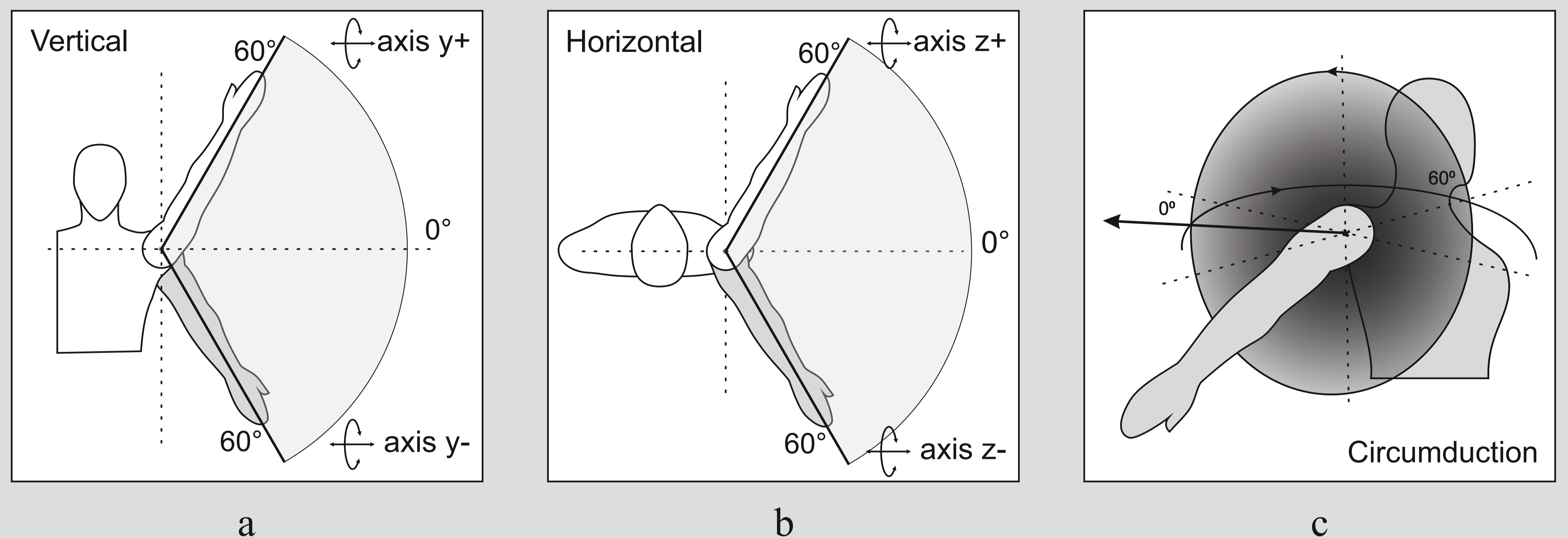


Figure 1. Types of movements of the upper limb, for the arm

KEYWORDS

Exoskeleton device,
 Upper limb,
 Human shoulder

CONTACT

Monica Leba
 Universitatea din Petroșani
 monicaleba@yahoo.com
 0736-980.865
 www.upet.ro

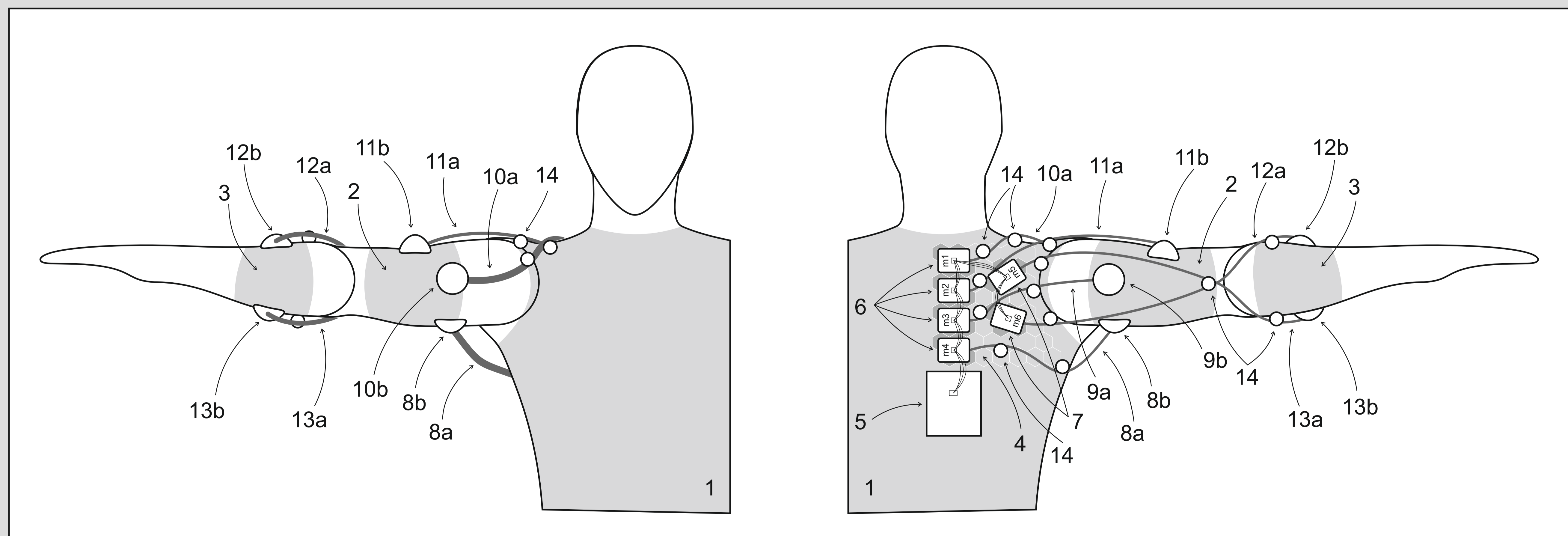


Figure 2. Device attached to a human garment