Wearable active robot with spinal polyarticular chain

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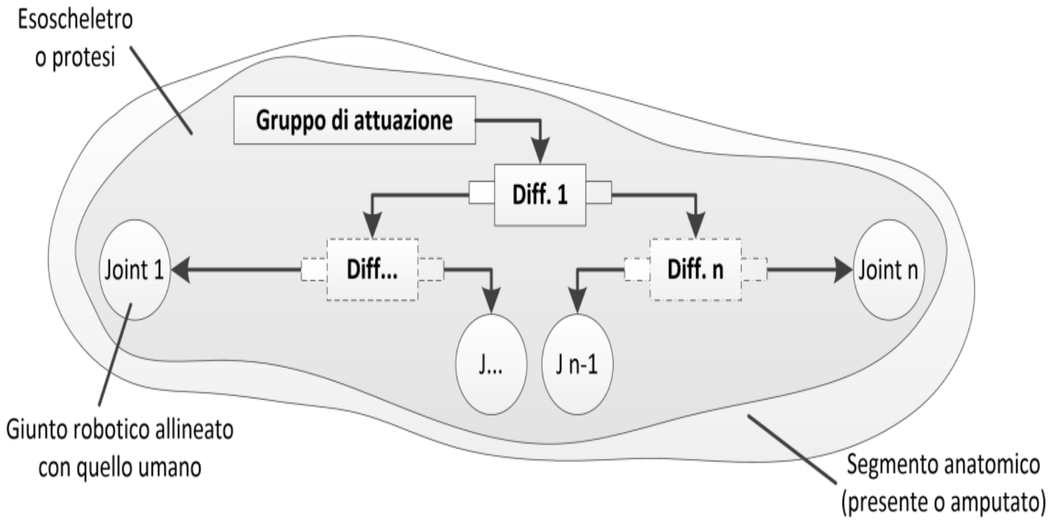
Invention

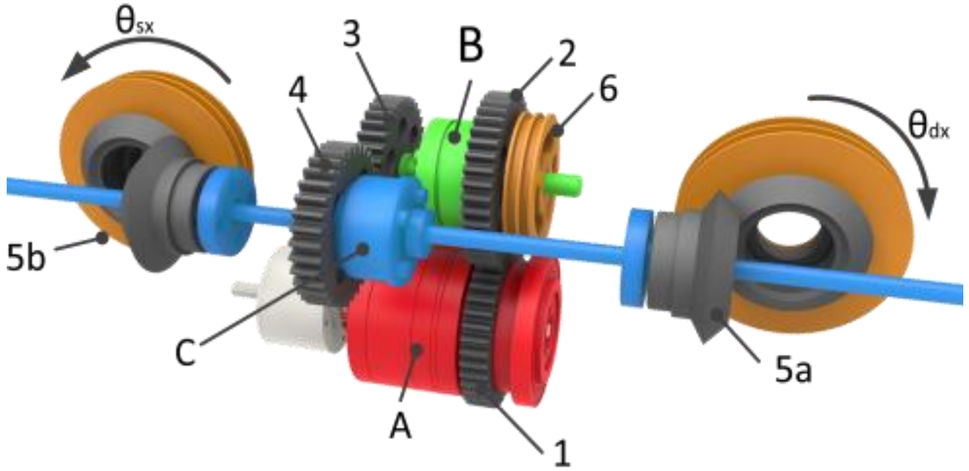
The new generations of exoskeletons are pushing more and more towards simple and functional solutions. There is a trade off between weight and footprint reduction and the ability to perform different tasks.

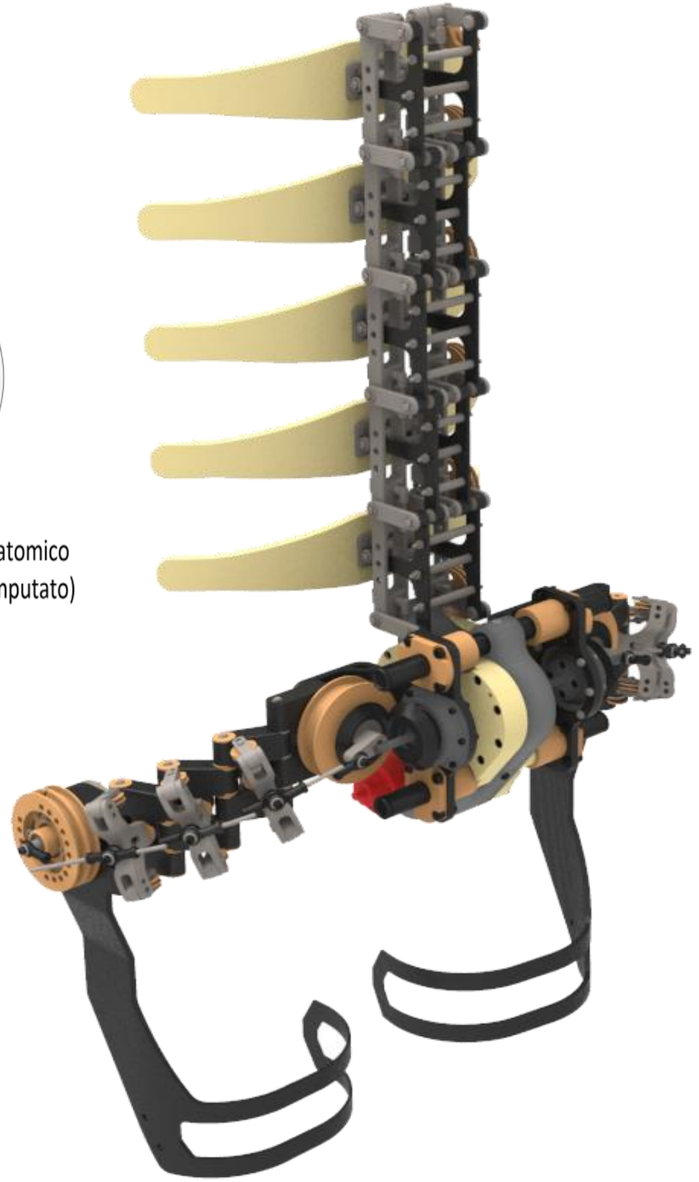
A much sought-after solution is under-implementation, ie a system in which the number of actuators is lower than that of the joints. This reduces weight but not joint mobility.

The invention proposes an actuation group that interfaces with a greater number of joints by means of a series of differentials.The invention is a transmission assembly of a hip exoskeleton associated with a back module.

Images


Esoscheletro
o protesi
Gruppo di attuazione
Diff. 1
Joint 1
Diff...
Diff. n
Joint n
J...
J n-1
Giunto robotico allineato
con quello umano
Segmento anatomico
(presente o amputato)


θsx
θdx
3
B
2
6
4
5b
C
A
1
5a



Applicabilità Industriale

The device has undoubted advantages that favor industrial applications: it is a light and compact robot, minimally bulky. The main purpose of this patent is to protect the use of a lower limb exoskeleton (ie: pelvis / hips) with one for the back implemented by a single central unit. The main fields of application can be:

- Wearable robotics
- Rehabilitation robotics
- Assistive robotics

Possible developments

The technology underlying the patent is in a development phase that is not yet fully mature for the market with the respective products.

The TRL is still to be considered low (eg: 2/3) suitable for experimental validation prototypes but has a great potential to enable the technology.

Still numerous other insights are needed by the research team to make the technology effectively applicable to a product.

For more information:

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