Titlepage

Theme: Master thesis

Title: Ugo

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Pages: 17

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This project focuses on the development of a new type of aid for children with Cerebral Palsy. The development is based on the user's needs in everyday life, and aims to develop a different aid that meets these needs. The project is made in collaboration with the producer of handicap aids, Meyland-Smith.

Synopsis

Reading guidance

The project is documented in two reports; a process report and a product report. The purpose of the process report is to describe the underlying work that has been done throughout the semester, ranging from the initial research and definition of focus areas to the development and detailing of the final product. The process report is addressed to supervisors and censor

The product report describes the final product and how it is intended to be used. The product report is directed primarily to the company Meyland-Smith and secondly to the end users.

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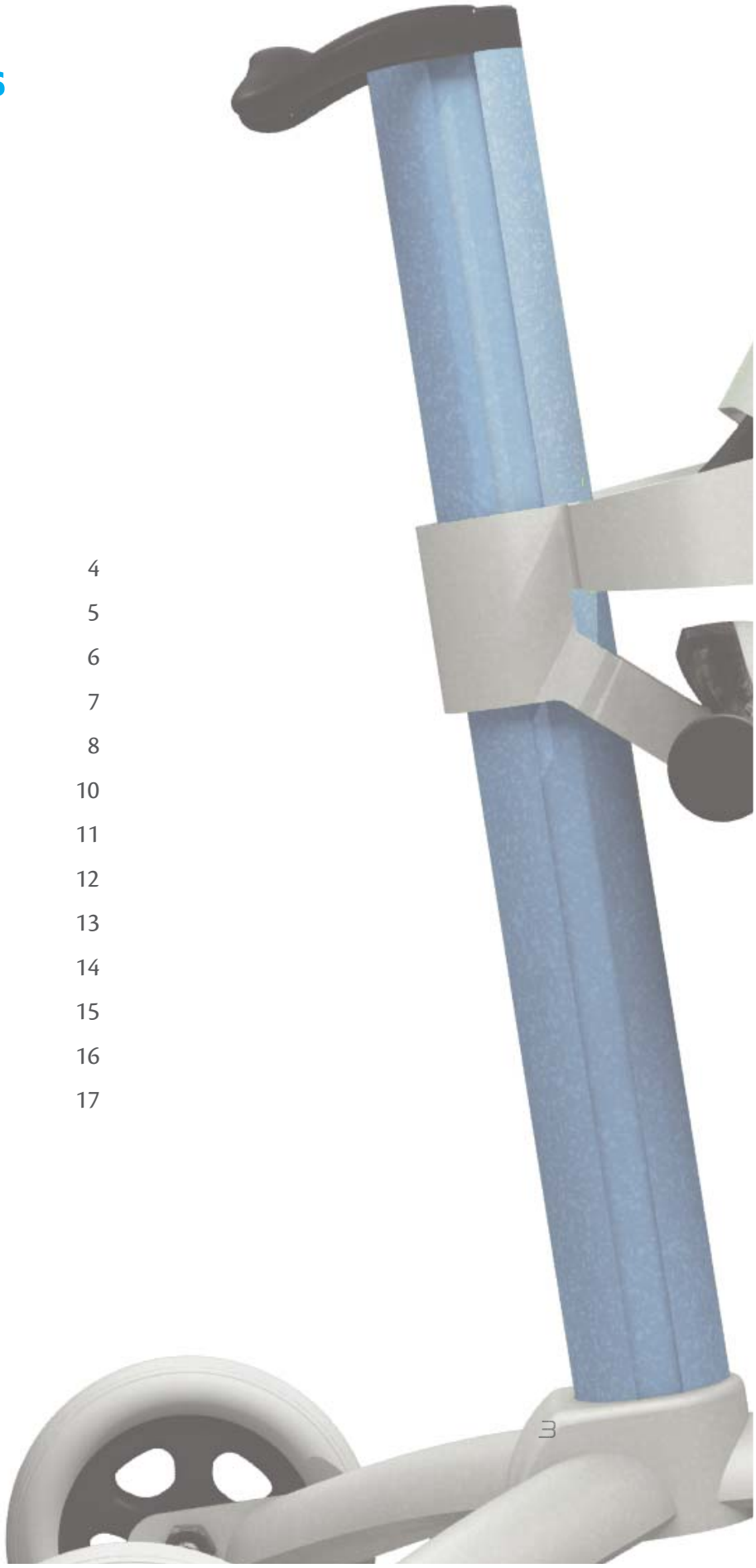


Users

Ugo is made for children with Cerebral Palsy from ages between 6 and 12 years. They have a medium level of physical handicap and none or little mental handicap.

Physical needs

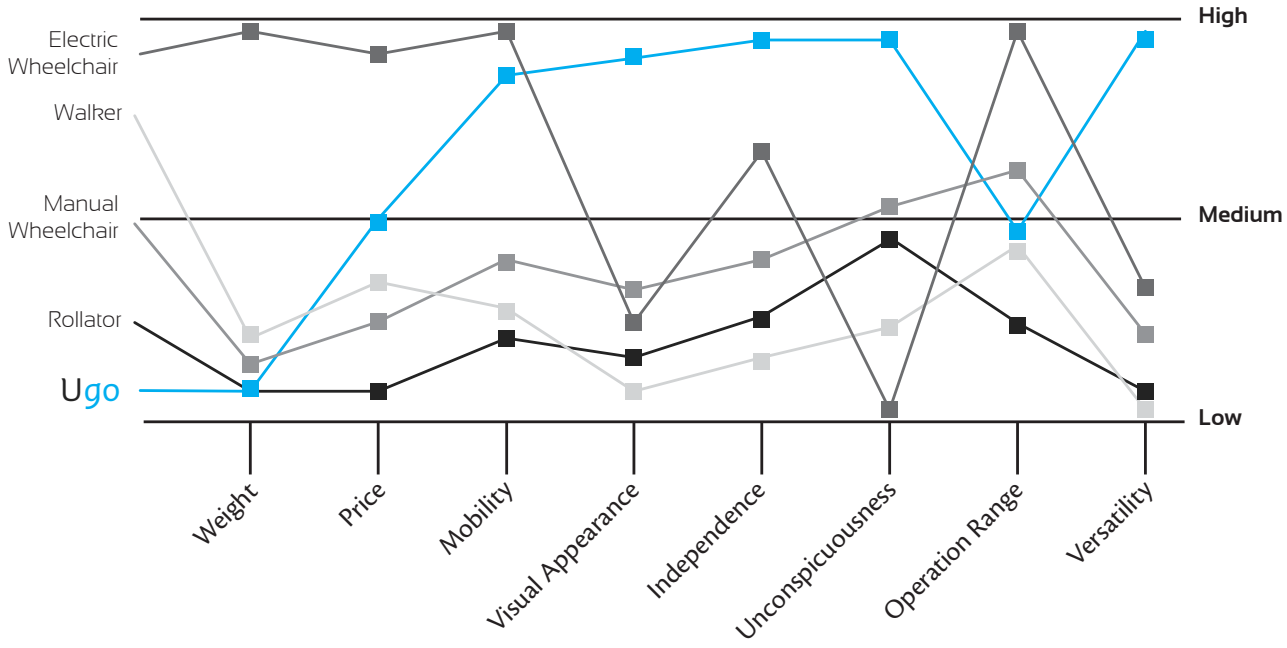
Because of the child's spasticity, the body needs support for functioning.

Need for developing

Like every other child, children with CP need to develop as persons, by acting more independently. Many actual aids interfere with this by limiting the child's movement.

Human focus

When the children are placed in an aid, the focus is often drawn from the child to the aid, because of its size. This means that they aid should be a simple, lightweight product promoting mobility and independency.



The aid offers new possibilities for the company. It changes the company profile, setting it away from training aids. Besides, it gives the company a "bestseller" that can be sold in the "wheelchair" category.
The products present on the market today are divided in very conventional categories.

Market Possibilities

Presentation

Ugo is an aid for the active child. Its main feature is to give the child the possibility to move around freely, in different seating positions. It also gives the possibility to change the height at which the child is seating.

Ugo is a simple looking aid, so the attention is drawn to the child, not the aid.

The aim of Ugo is to be "the most preferred aid of the day", making every day easier, thus the focus of use is at home –inside and the close surroundings, meaning the pavement and garden. At the care institution it is indoors and outdoors areas.

Ugo is easy and simple to adjust by the parents and caregivers as well as therapists.

Working table height

Walking height

Ground height

On Ugo, the child is able to get to the floor. This gives the child the possibility to play with others and to follow the play and change position without help from adults.

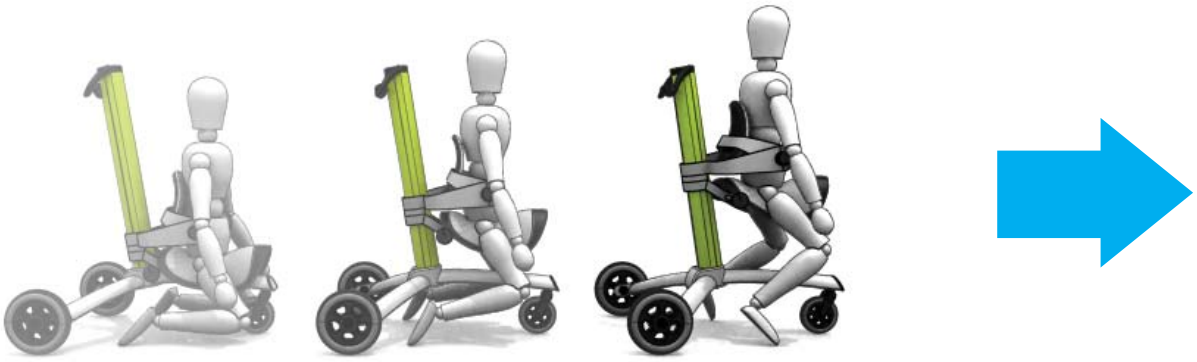
At the highest position, the child can participate in the family's daily doing, e.g. in the kitchen. At this height the adults have an ergonomic working height when helping the child. The footplate (accessory) should be mounted before the seat is raised higher that the child can reach the ground.

The seat can be adjusted to a position where the child can move around by itself, whether the best position is with the knees in a 90° angle or 180° (depending on the special needs for each child).

Changing Height

The child is able to play at a ground level.

The height is changed with a remote control



Scenarios

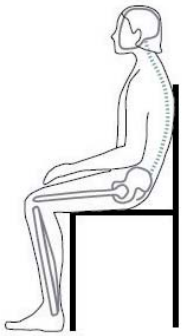
A normal day for the child involves a lot of different aids; hence the day is filled with many shifts between them. This is very demanding for the child as well as for the parents and caregivers, who are exposed to many heavy lifts. Besides, the child's independency is limited when relying on grown-up's help in order to move.

One aid, in many different situations.

The child is also able to move around more naturally.

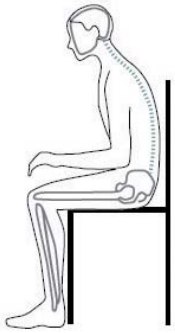
Ugo reduces the shifts between aids during the active time of the day. It can be used when playing, walking around and when working by a table –regardless of the table height. A change is only needed when switching to a training or resting aid.

Spinal Position on Saddle Seat.



Spinal Position on flat seat.

Spinal position leaning forwards on Saddle Seat; action takes place at hips.



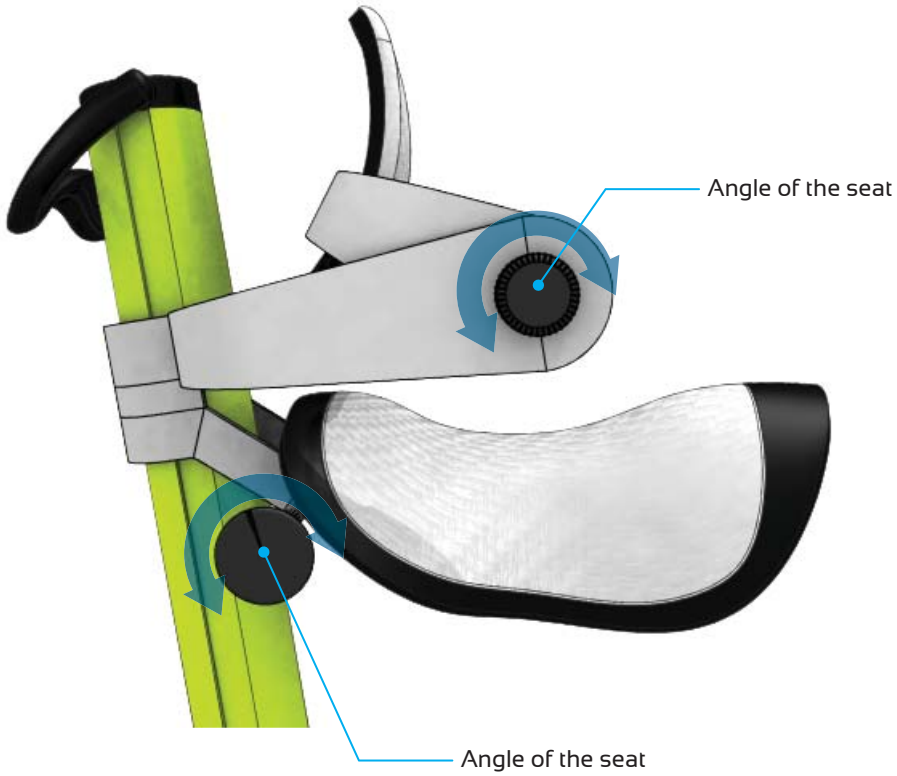
Spinal position leaning forward on flat seat; action takes place at waist.

Saddle Seat

The saddle seat has advantages, compared to normal seats. It forces the child to sit in an ergonomic correct way, also allowing the movement of the legs and at the same time it fixes the body, so it does not slide back or forth. The saddle seat is used in different solutions for office chairs, for accommodating an active and ergonomic sitting position.

The saddle shape also keeps the legs apart preventing the spastic muscles to cross the legs.

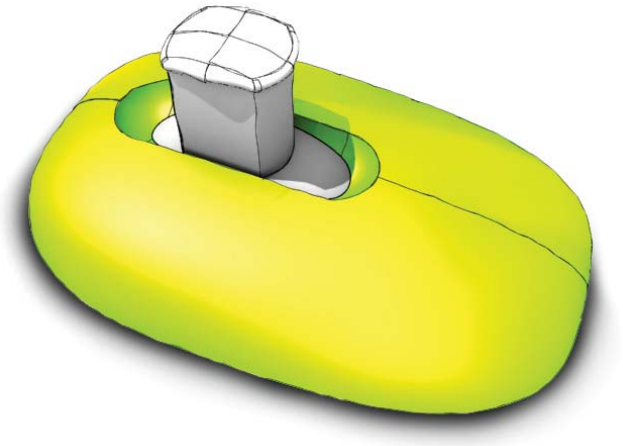
The position of the wheels –backwards- leaves space for the feet, when the child is walking around.

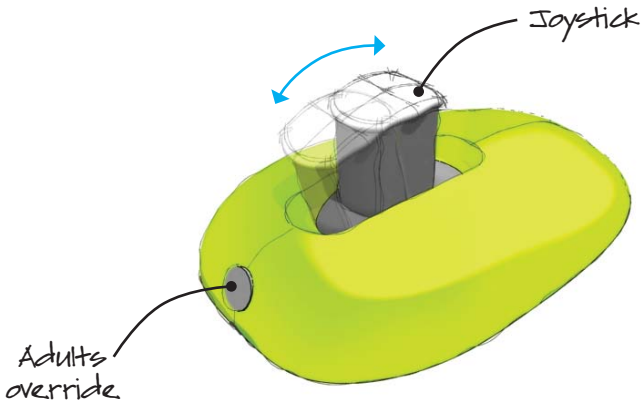


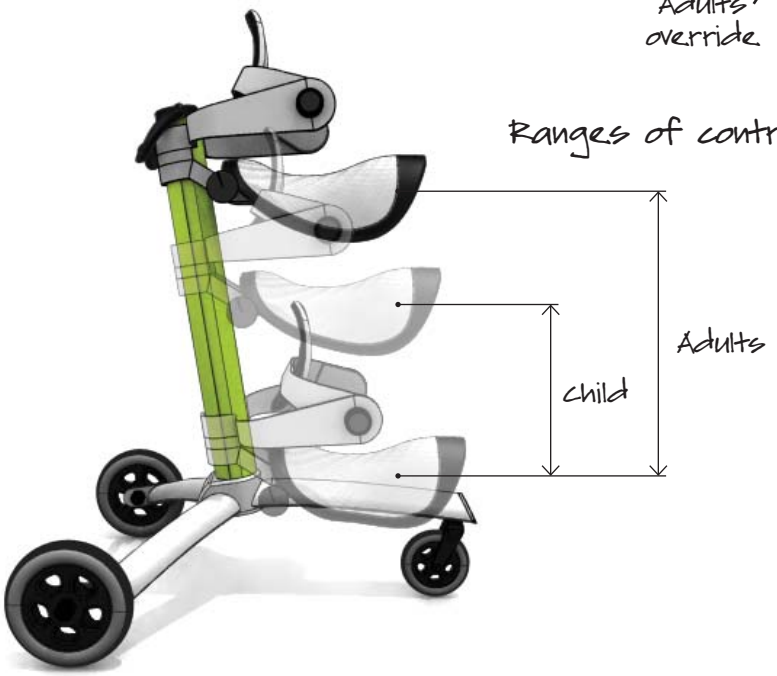
Adjustments

The back support forces the body to keep positioned correctly by supporting the lumbar area of the back. The side supports prevent the child from falling sideways off the saddle seat. Since some of the children have epilepsy as an additional disorder, extra support is needed in these cases. The side support is placed at the hips rotational point, giving the best ergonomic fit for the child.

The angle seat and the back support can be adjusted to facilitate a correct sitting posture.

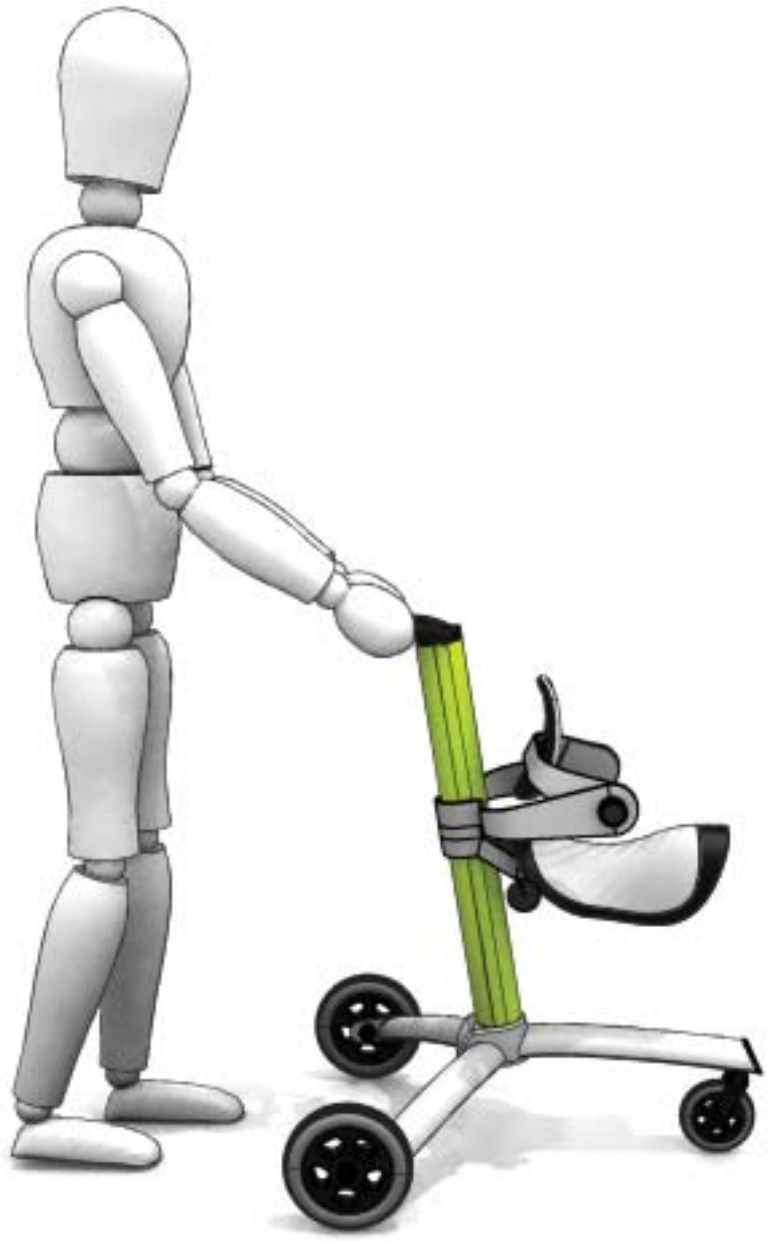


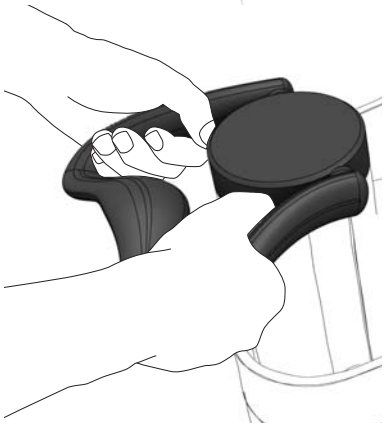




Remote Control

The remote control can be used by either the child or the parents and caregivers.
The child is using it to move the seat from floor height to walking height, including all heights in between. The remote can be attached to either the seat or to a place on the body where the child can easily operate it.
The remote has an adults override function, so only the adults are able to elevate the seat, after mounting the footrest, high enough to lift the child's feet off the ground. The override function is an integrated button on the remote, which demands fine motor control to be pushed.

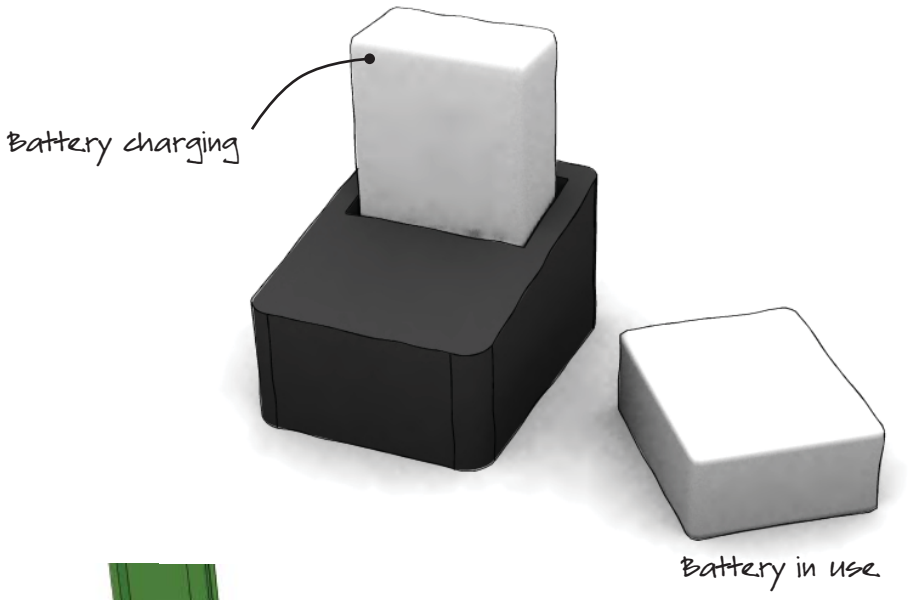


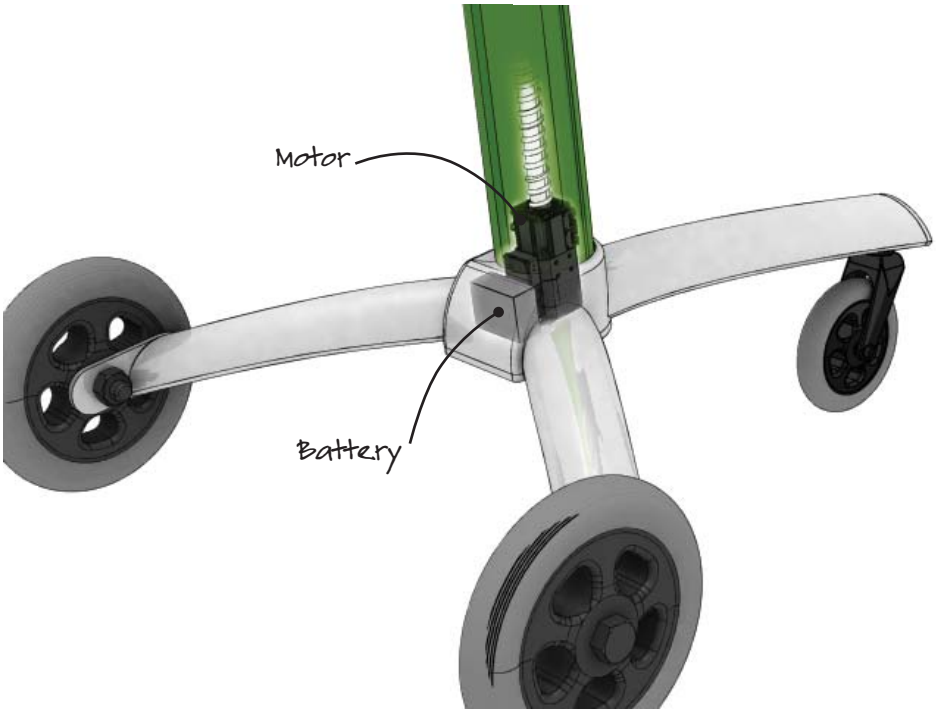


The handlebar allows three different ways of hold it, becoming more comfortable for the adults and giving a more natural interaction with the child.

It is possible to walk by pushing the chair or even walk to the side of it, so the child gets more attention by having an aid which is not intrusive.

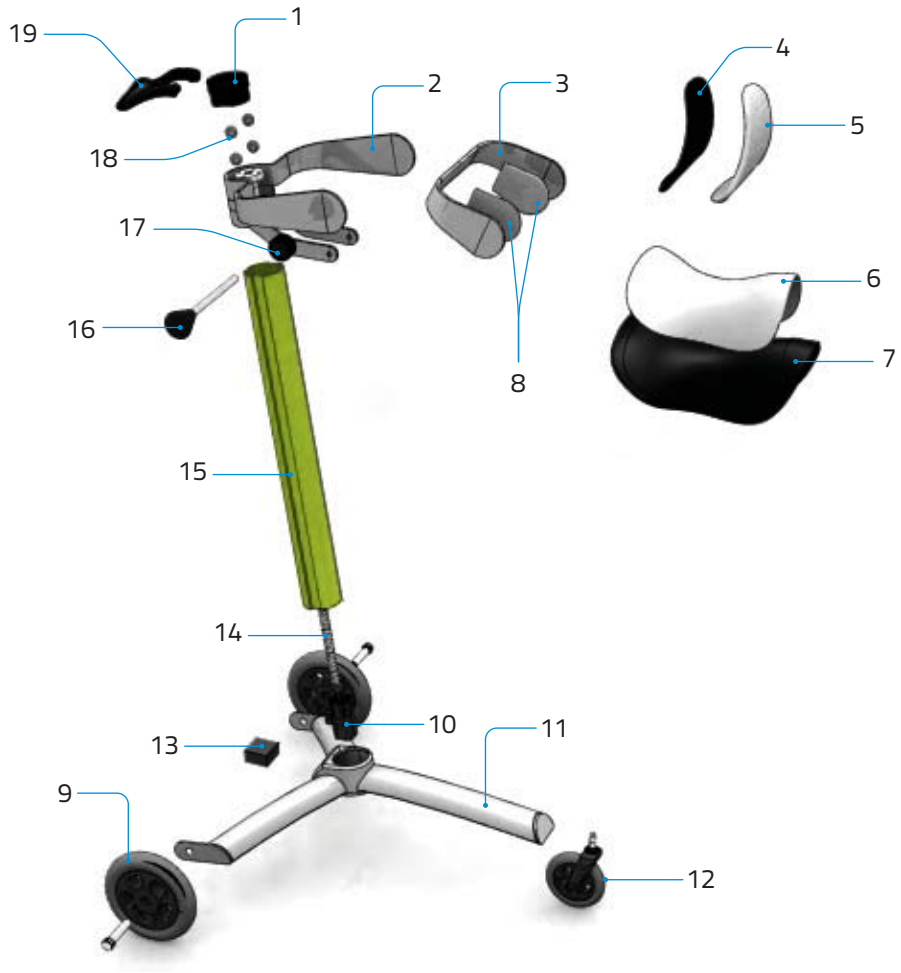
Handlebar





Changing batteries

The movement of the seat is powered by a motor and a battery. The battery is a lithium-ion battery, thus it does not discharge over time. If the battery runs flat, it can be replaced by the battery stored in the charger. In that way there is always a charged battery ready for use..



#	Piece
1	Profile Tap
2	Seat unit joint
3	Backrest support
4	Backrest
5	Backrest foam
6	Seat foam
7	Seat
8	Side support
9	Back wheels
10	Motor
11	Wheelbase
12	Front wheel
13	Battery
14	Bolt
15	Profile
16	Angle-seat grip
17	Angle-backrest grip
18	Stabilizing wheels
19	Handlebar

The production was very much considered, aiming at making an aid which could be easy to manufacture as well as trying to keep it low cost.

The table shows the main pieces of the Ugo.

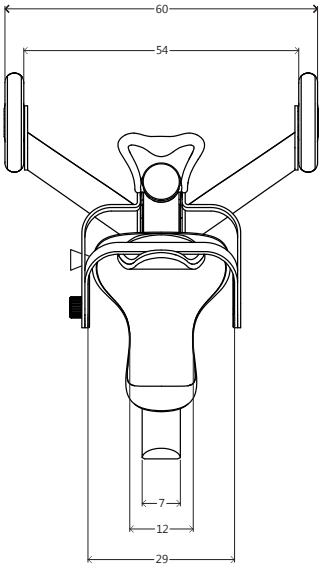
Pieces

Variations

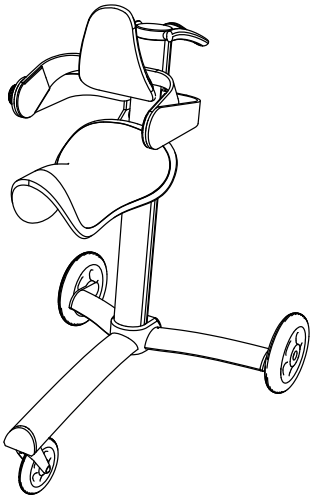
Mostly made of anodized alluminium, the Ugo can be presented in several colours.

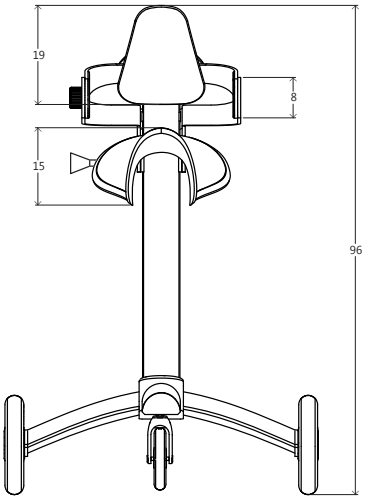
Here some combinations, either by changing the colour of the alluminium or the foam.

The appearance of the anodized alluminium makes it a more attractive aid, which becomes an important issue for children at these ages.

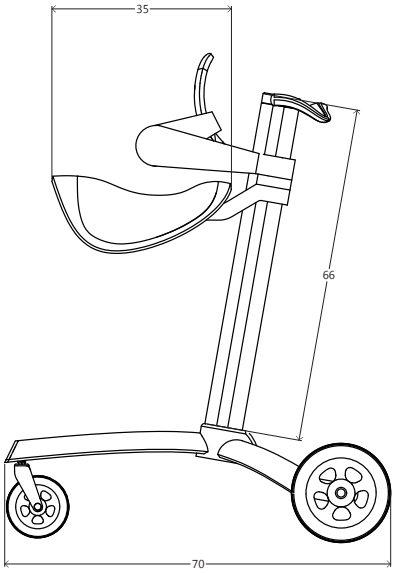


Top View





Front View



Right View

These are the general measurements of the Ugo. The complete set of general views can be found in the Product Detailing Phase from the Process Report.

Technical Drawings