Sarah Frix

Industrial Design

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Website Portfolio
https://www.sarahfrixdesigns.com/

Professional Statement:

As a designer specializing in the health sector, I am dedicated to identifying subtle yet impactful opportunities that significantly enhance user health outcomes. My focus lies in developing solutions that not only fulfill immediate objectives but also tackle broader and critical challenges.

Experience

Custom Design Incorporated
1 Yrs
Jun 2023- Present

Role: Lead Designer

I work directly with our in-house engineering and sales teams, as well as with our plant manager. I begin by creating rendering designs tailored to the clients' needs, and then proceed to manage any necessary design and engineering revisions. Additionally, I play a crucial role in the production phase by completing graphics and laser-cut materials required for the production units

Rhode Island School of Design
2.5 Yrs
Aug 2020- Dec 2023

Role: Shop Monitor

Description: Servicing and monitoring our Industrial design Model shop and CAD Labs. This involves safely aiding and demonstrating woodworking, metalworking and model making machinery to students as well as operating and maintaining 3D printing and laser cutting machinery.

Education

Rhode Island School of Design
Providence RI 2023

BFA Industrial Design
Honors Bachelor Degree

Brown University
Providence RI 2022

Sociology and Psychology
Focus Groups for Market Research Course

Skills

Computer
Soldiworks/ Rhino/ FormZ/ Keyshot/ Blender/ Adobe Suite/ Figma/ Miro

Fabrication
Quick Prototyping and Modeling/ High- Fidelity Model Making/ Metal working/ Advanced Wood working/ Ceramics and Pottery/ Mold making

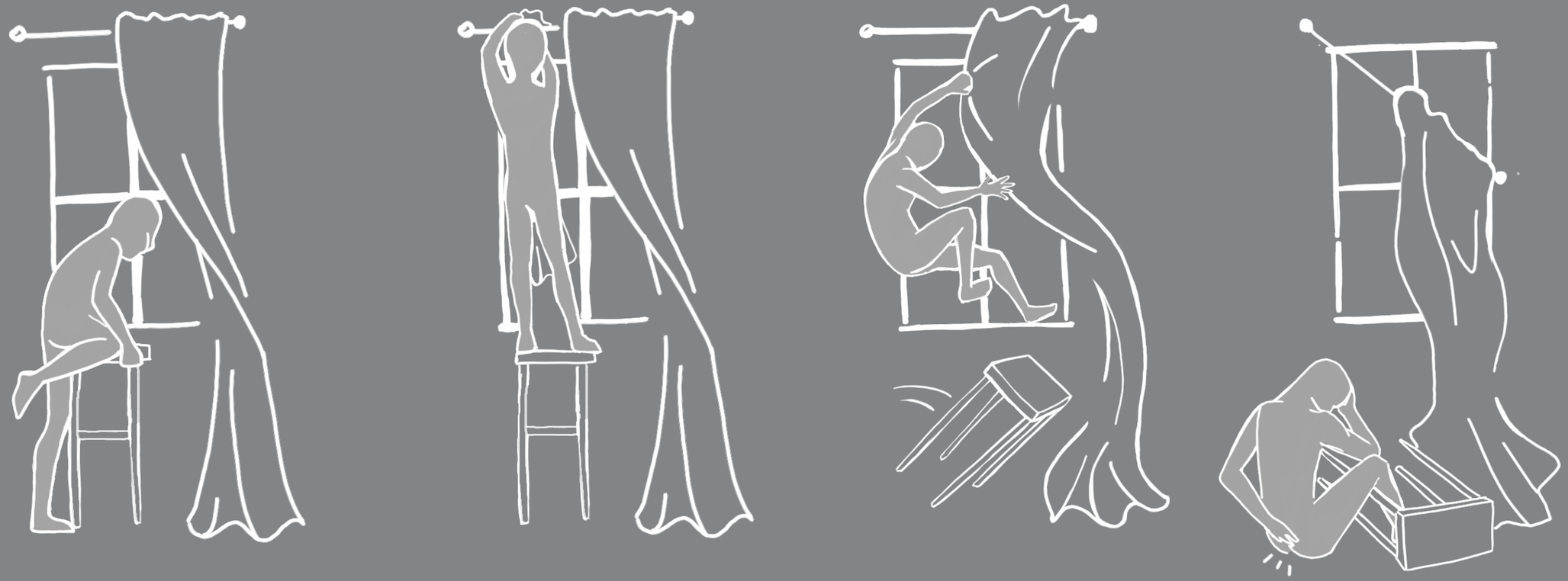
Soft Skills
Manufacturing Techniques/ User Research/ Ergonomic Study/ Quantitative and Qualitative Interviewing / Hosting and Organizing Focus Groups / Creative problem solving / Interaction with clientele

GeMick Stool

2022

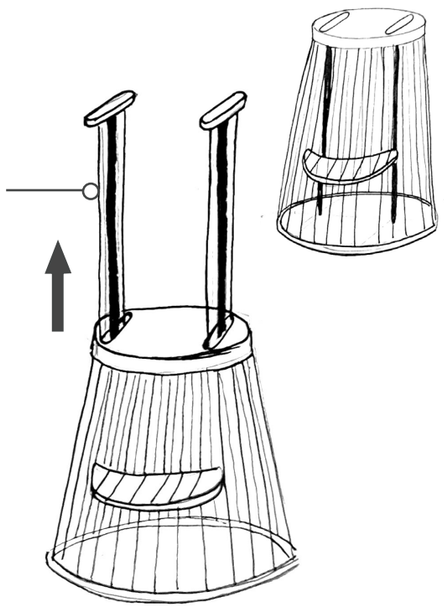
A counter-top stool that converts into a step stool.

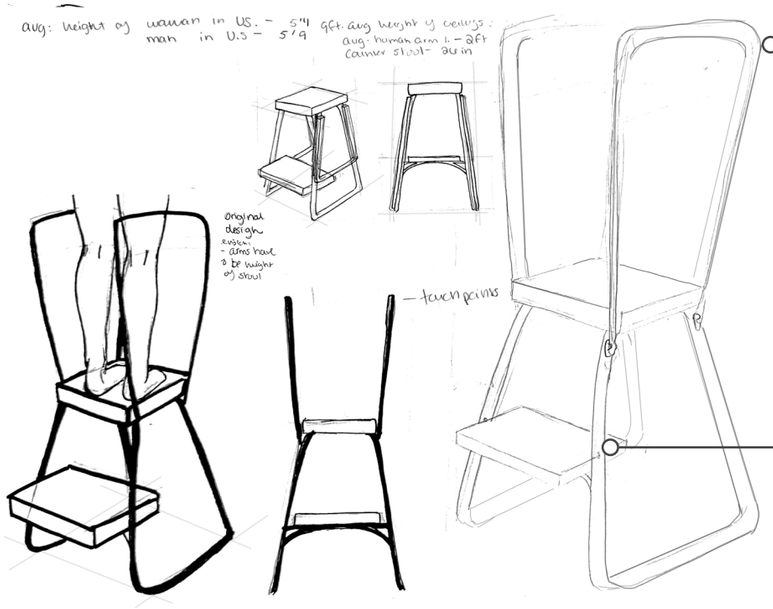
Unfortunately based on a true story...



Sketches

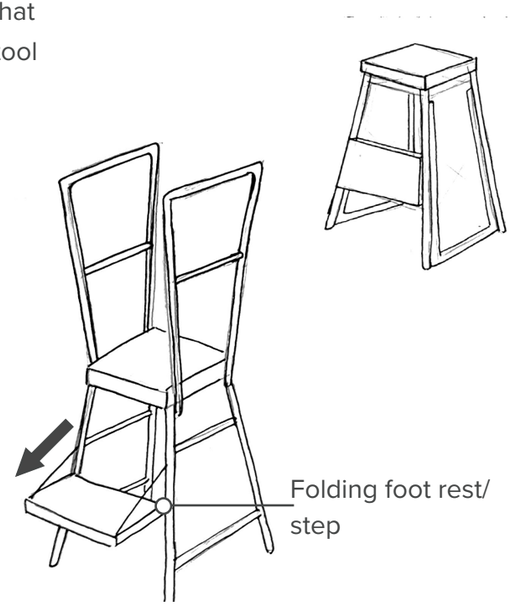
Submerged supports



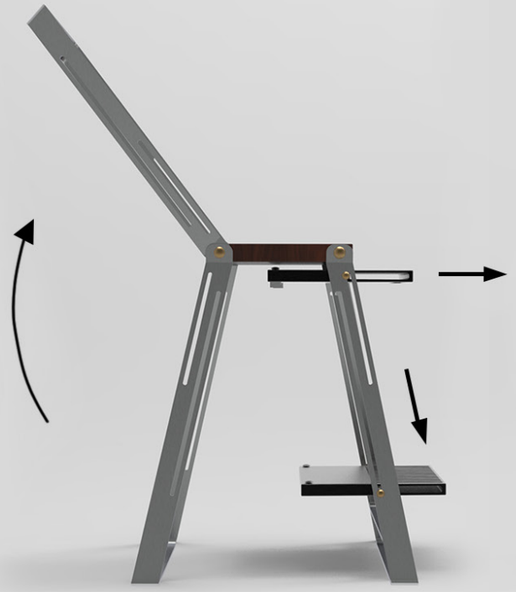


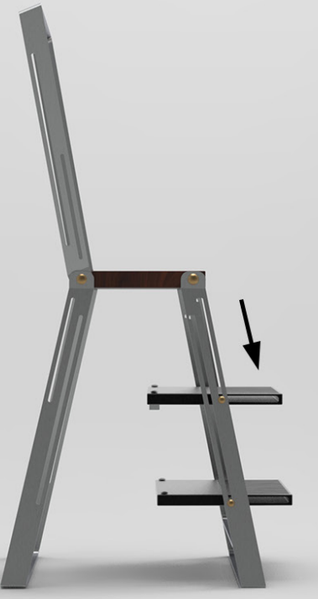
Folding hand rails that return to sides of stool

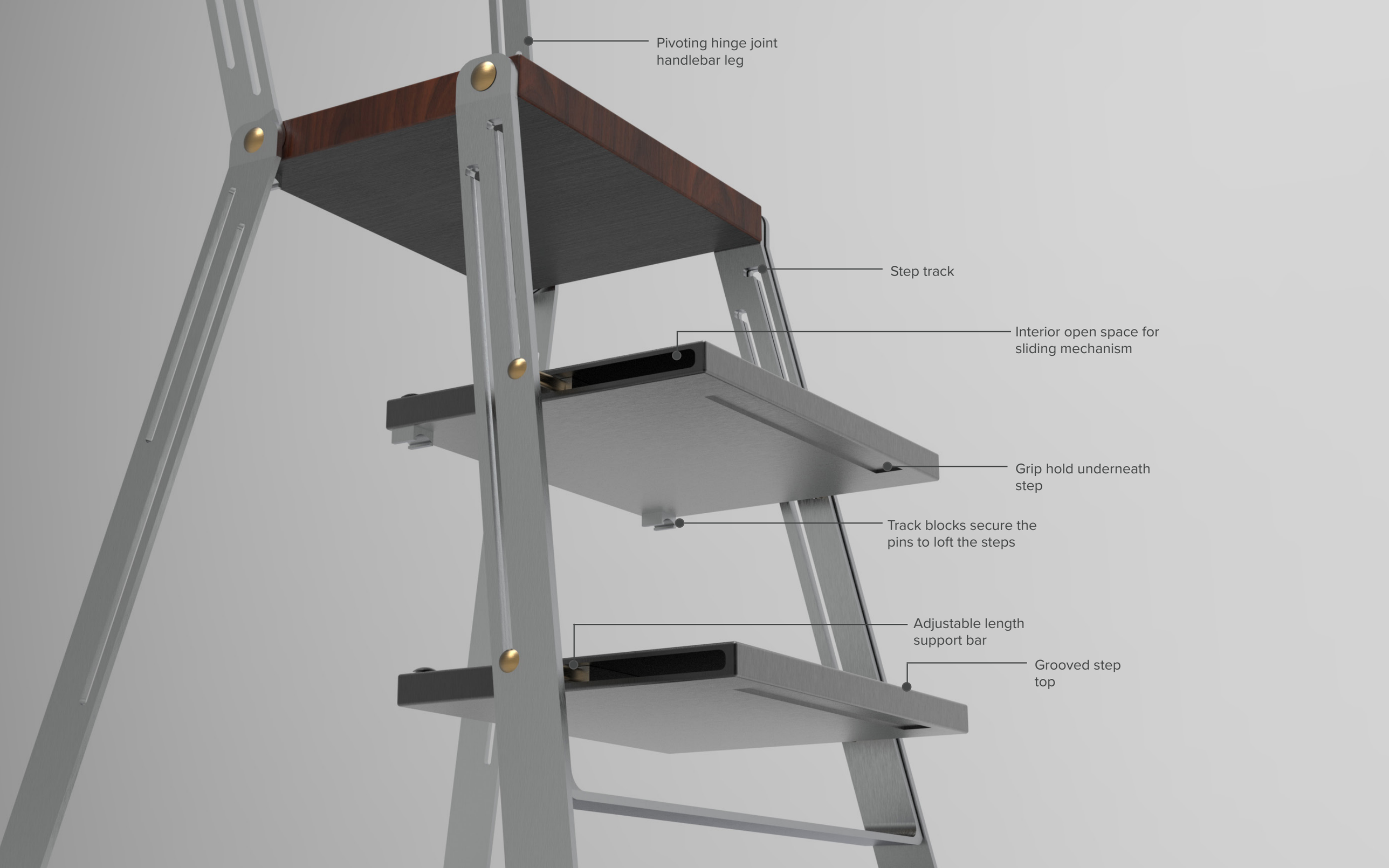
Stationary foot rest/ step

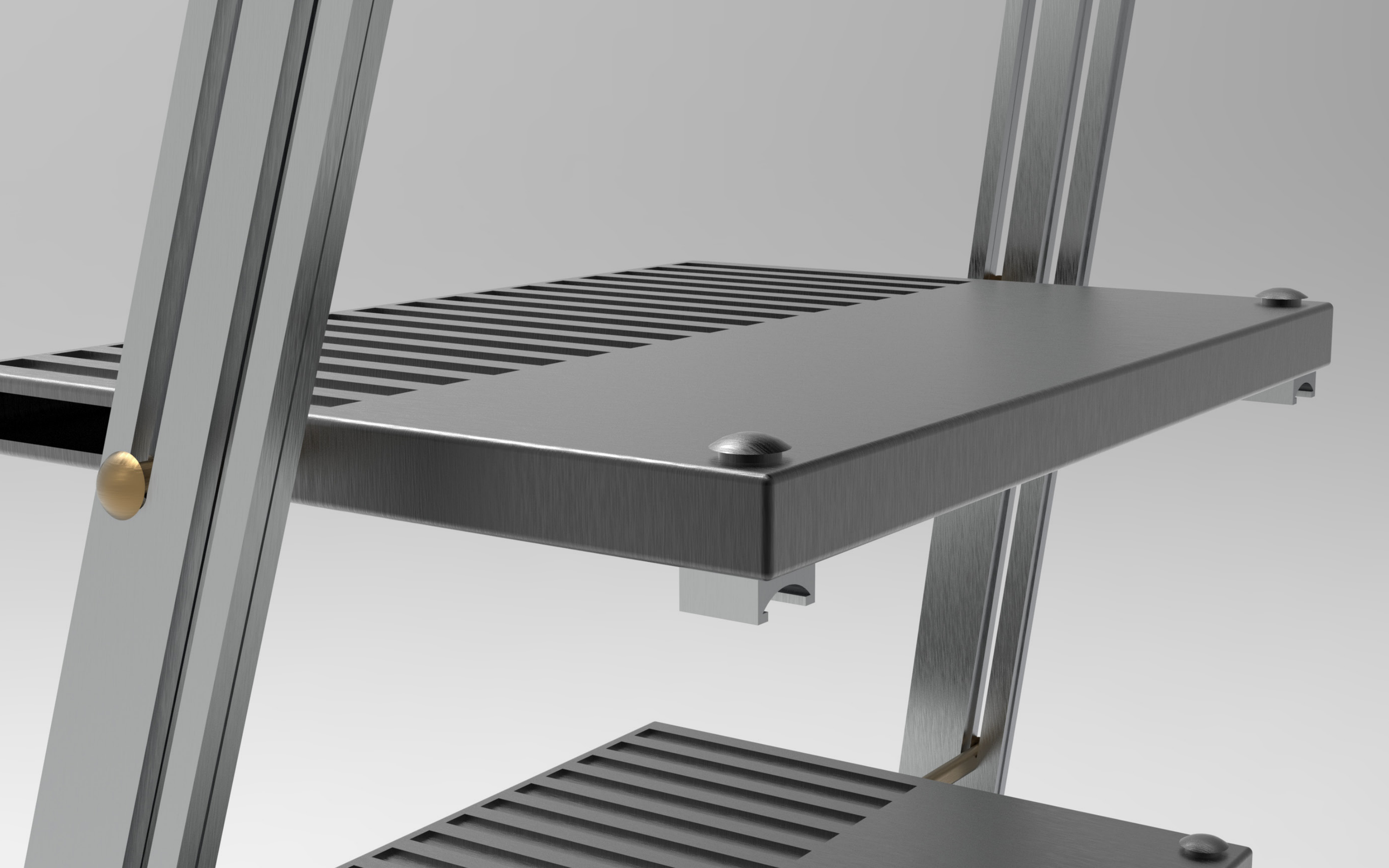


Folding foot rest/ step

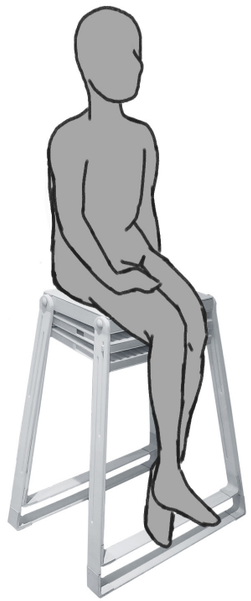




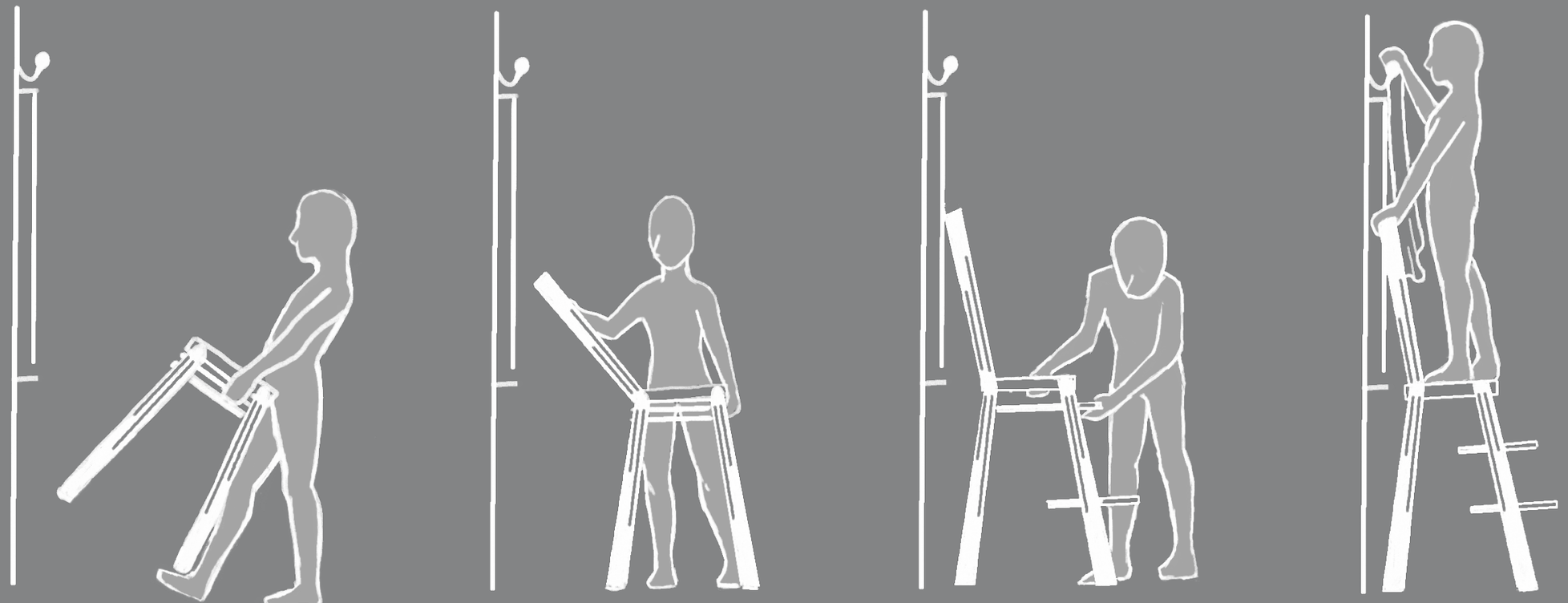

Pivoting hinge joint
handlebar leg
Step track
Interior open space for
sliding mechanism
Grip hold underneath
step
Track blocks secure the
pins to loft the steps
Adjustable length
support bar
Grooved step
top



Scale Model



Someday a true story...



Nobelt by Nofus

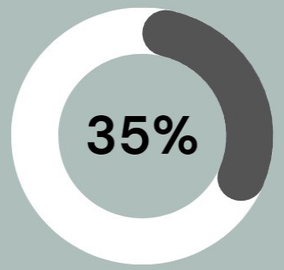
2023

The Nobelt explores an easy quick release system that allows the wearer to take off their pants quicker and with less pain points. Our research shows that one of the leading causes of elders' transition to assisted living is incontinence accidents at home. The Nobelt will save those vital seconds before the accident. Sometimes, seconds is all it takes to make the biggest differences.

Hear Dave's Story

Before retiring, Dave practiced many years as a lawyer. So by habit and preference, he always preferred to dress nice and wear his casual professional clothing. However, Dave suffers from severe Parkinson's resulting in jerking wrists and forearms. He mentioned this particularly makes it very difficult to go the bathroom in a timely manner, and has since had to sacrifice his usual pants and belts.

And he is not alone.



Of senior adults suffer with Incontinence or Urinary Leakage

Of adults 75 and older suffer from either Rheumatoid Arthritis or Osteoarthritis

As of 2023 over

500,000

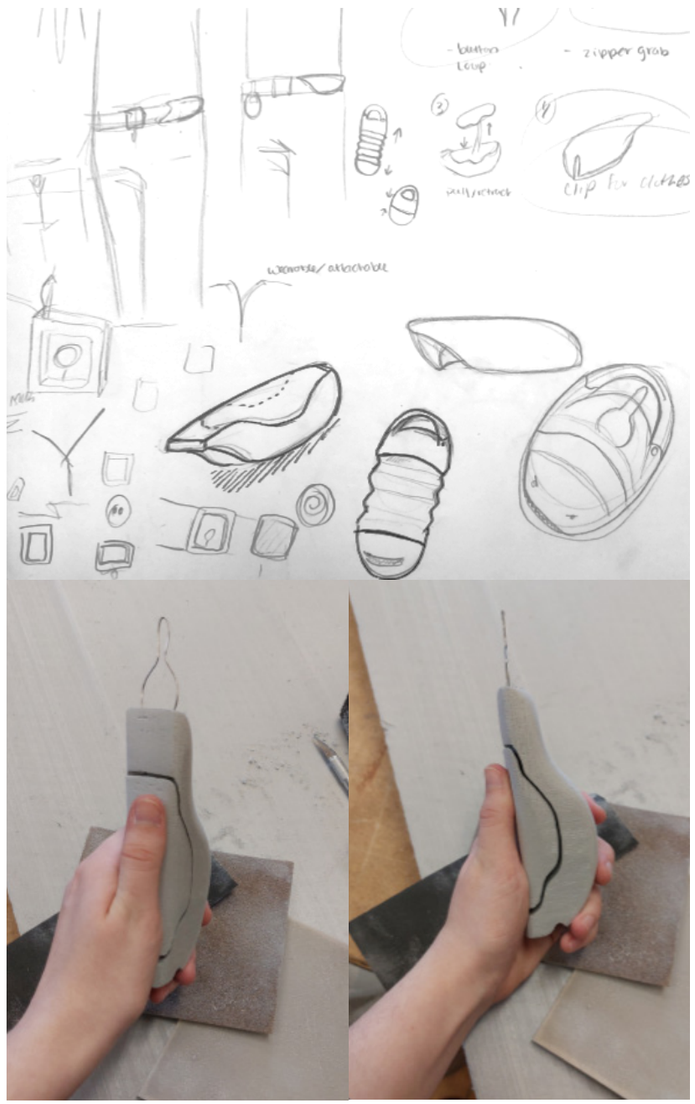
In the United States have Parkinson's Disease

- Unmeasured urinary accidents that are happening at home
- Unknown number and % of falls related to urinary accidents

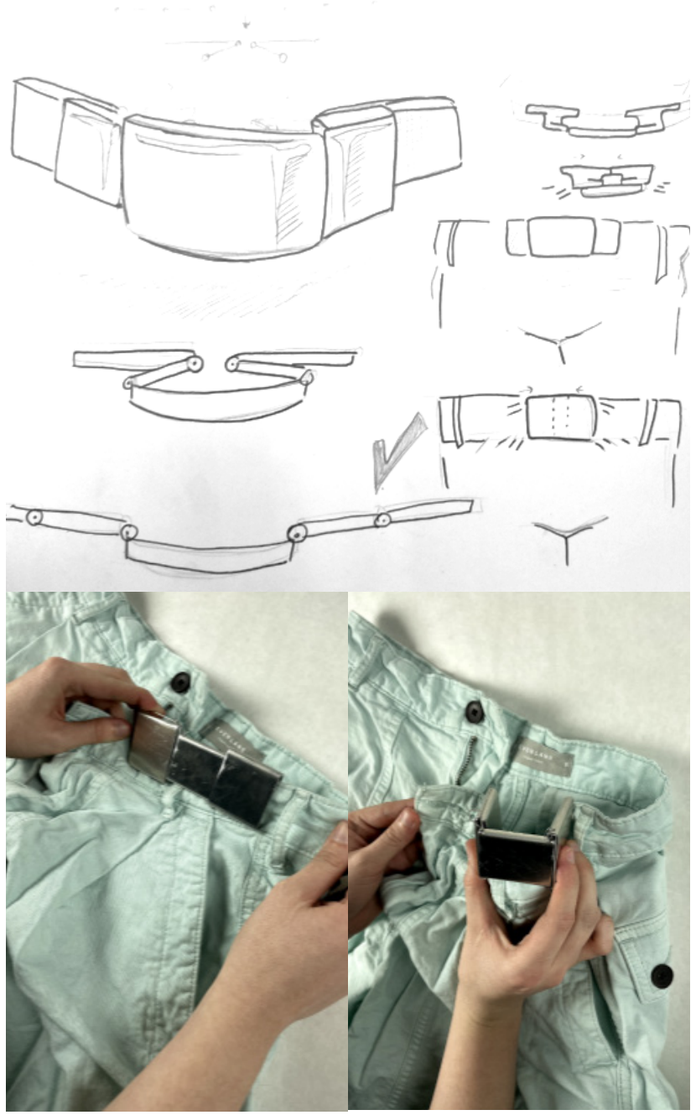
How might we create a simple fashionable tool that allows for the users to remove their pants quicker and with less pain points?

Sketches

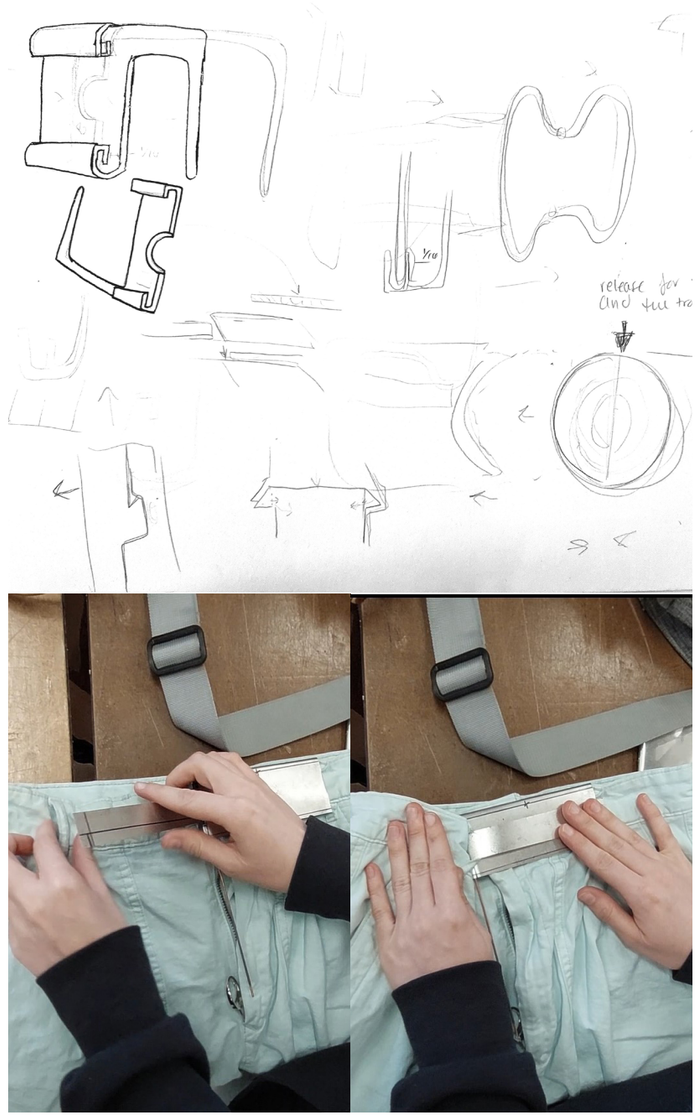
This version focuses on a wearable multi-tool that adjusts in size based on the wearer's needs. We designed it to clip onto a belt loop for convenient access, featuring components such as button loops or grab clips to assist in removing pants efficiently



This explores a device aimed at folding the pant material instead of cinching. Rather than a multi-tool, we delved into methods to speed up and improve pants removal, including exploring fast, mechanical releases.



Although not the final design, we persisted in testing to enhance cinching and releasing mechanisms. We experimented with various intricate button mechanisms and fabric folding techniques. In this phase, we revisited our focus groups to conduct user testing on this concept.

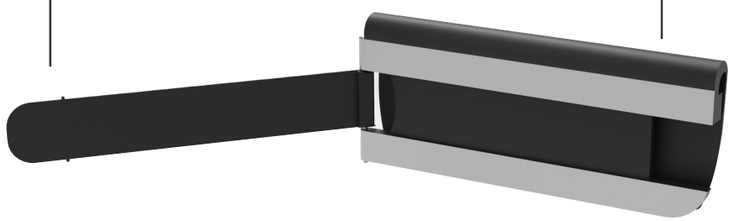


Further Iterations and Takeaways

V1

Hinged “arm” that loops through pant loops and cinches material

Locks into place with a click and is pushed out to release

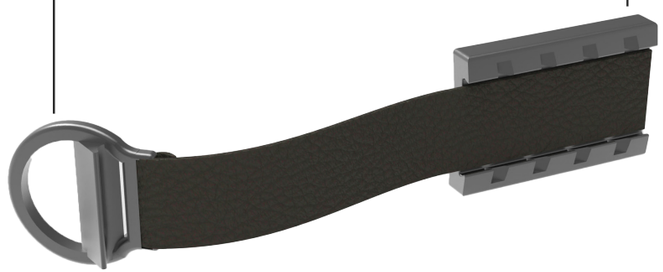


Take away:
- Product too bulky
- Continue focusing on how to cinch the fabric

V2

Looped “buckle” has a hook design that clips into the ridges along the main body.

Main body hooks through the button loop and has a ridged design

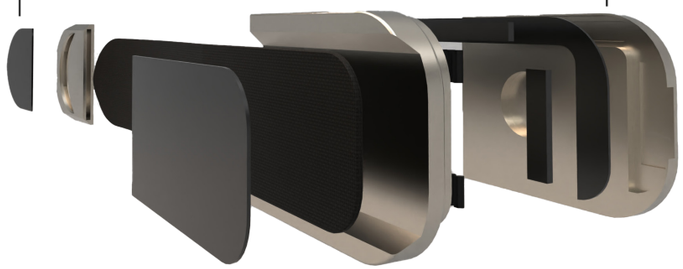


Take away:
- Product not stable enough on the user
- Continue to use a soft material to cinch the fabric

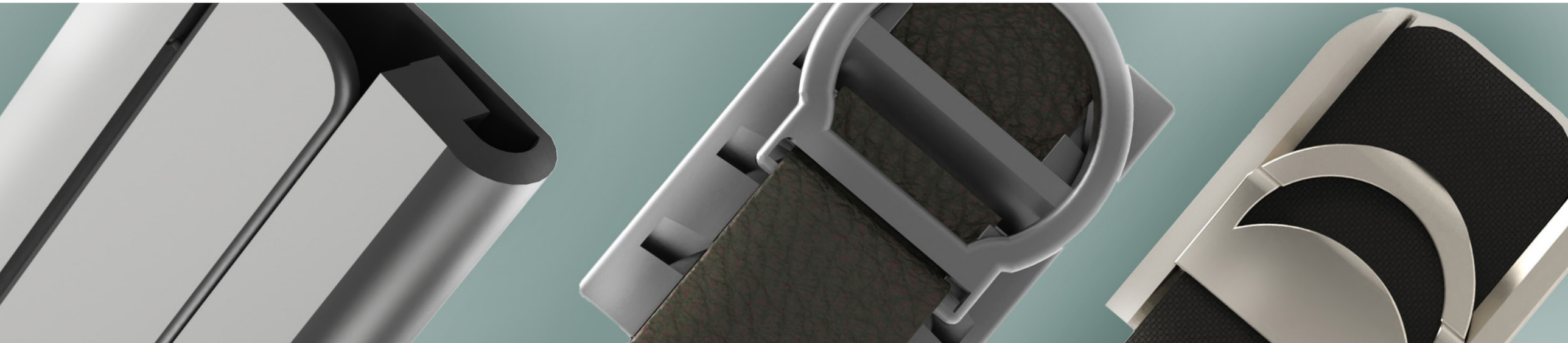
V3

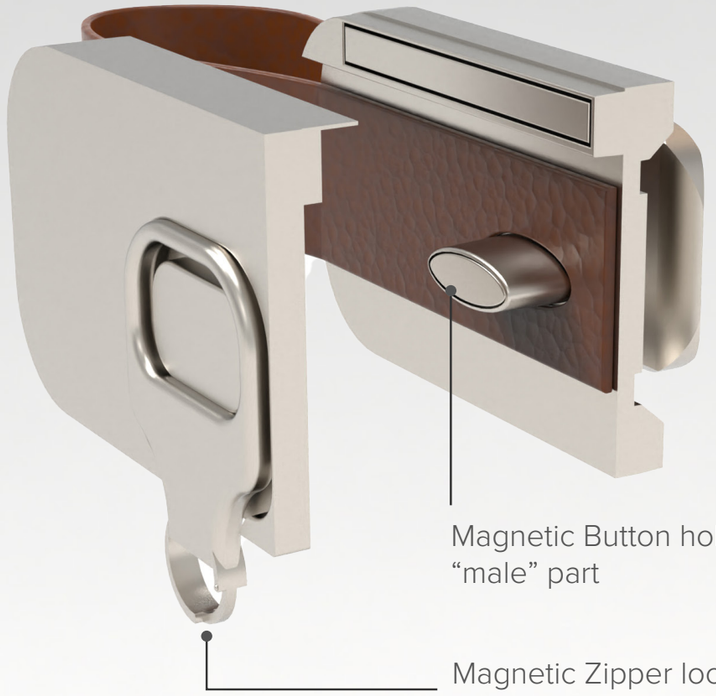
Magnetic loop that attaches to magnetic back

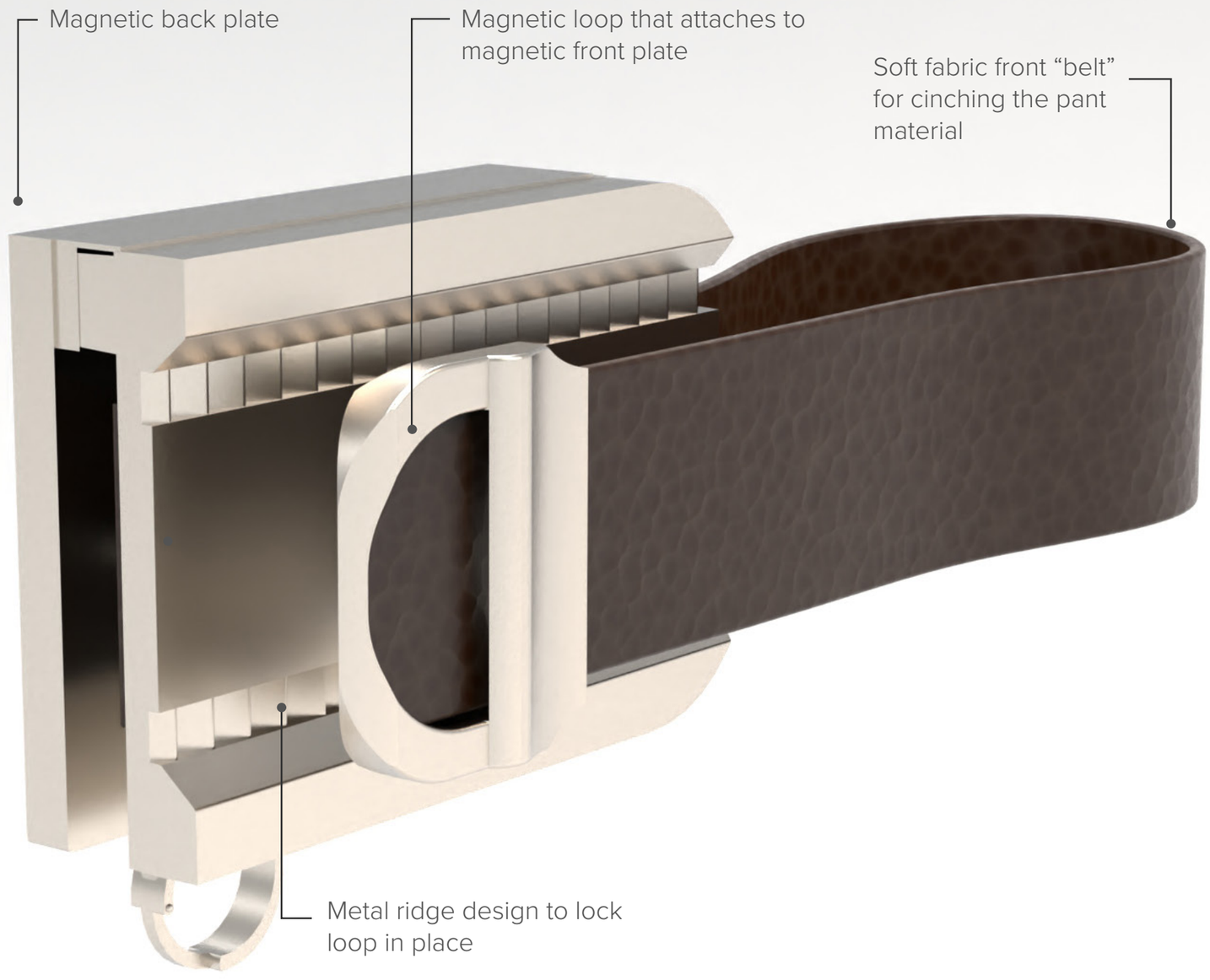
Back component that magnetically attaches to front body through the button loop



Take away:
- Magnetic loop slips on surface, will return to ridged design
- Continue with a front and back magnetic build

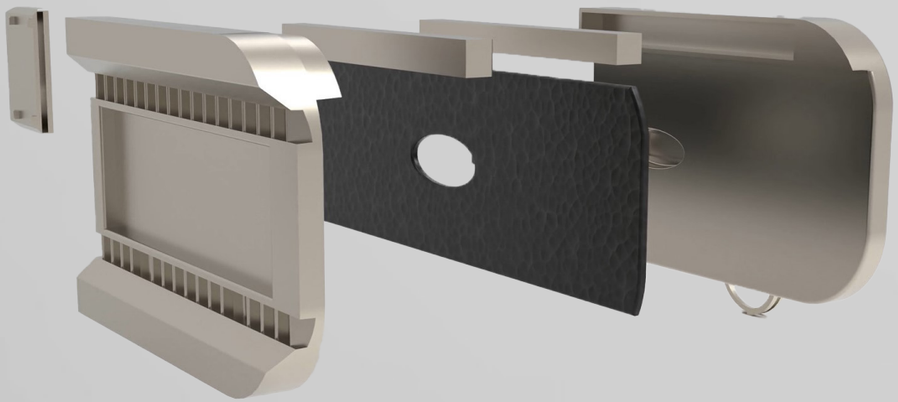




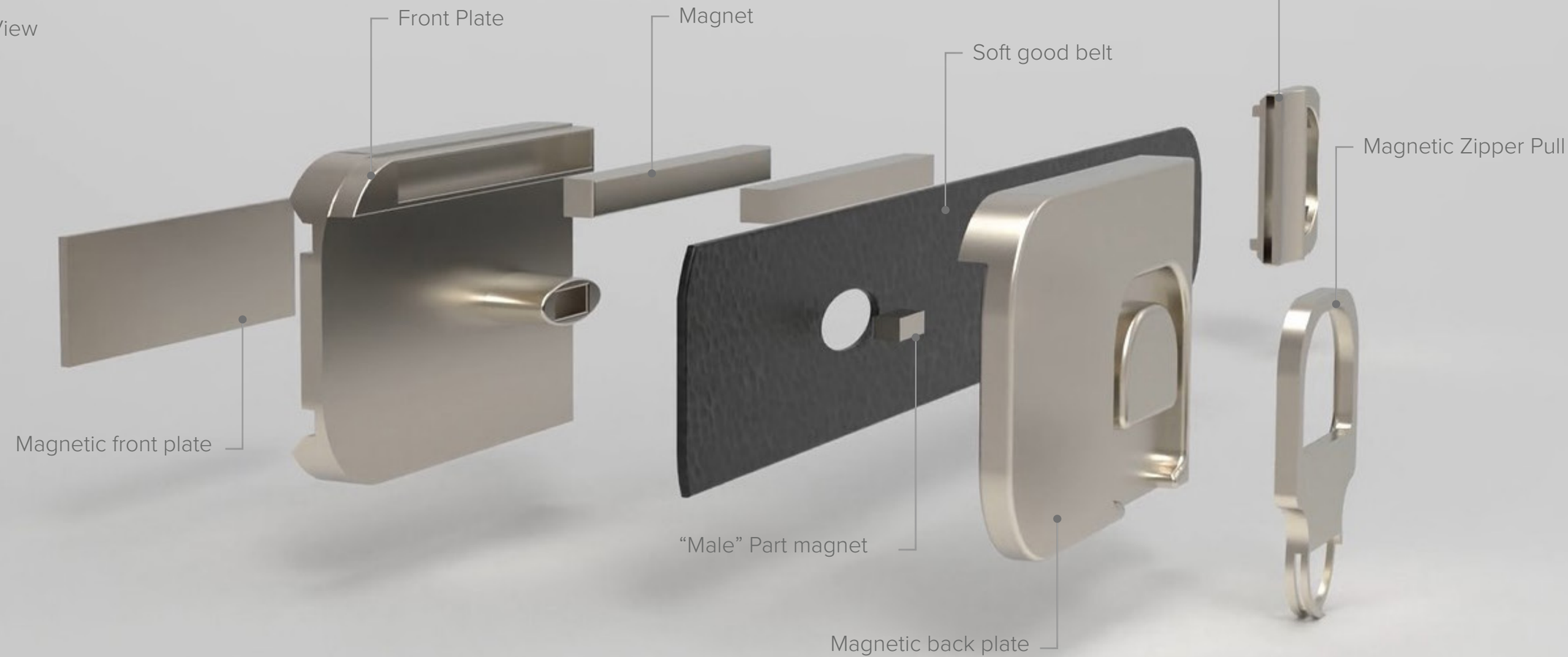


Final Model

The final version of the Nofus is a two body part that has two points of contact to attach to the pants. The first is looping through the button hole with the magnetic male and female component, and then over the top of the pants with the top connecting magnet. The ridges on the front of the device prevent the front buckle from sliding once the product is in use. And lastly, the product comes with a custom Zipper pull that when in use, keeps the zipper up and then allows for an easier grip when needing to unzip.



Front Exploded View

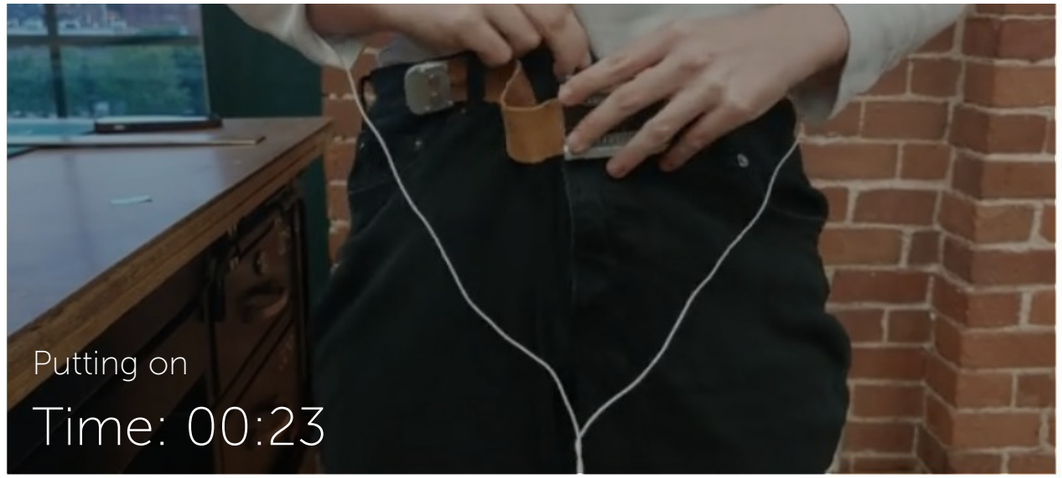


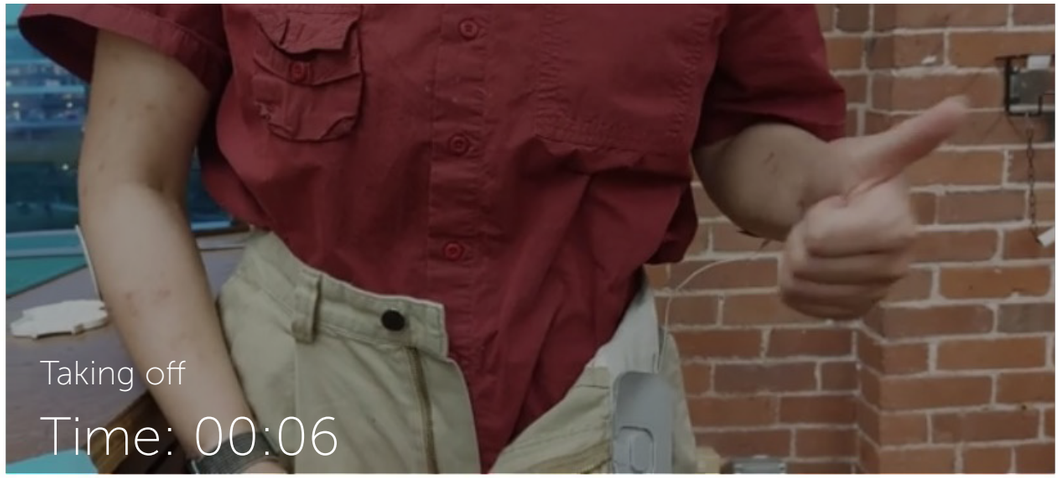
Testing Phase 1

Controlled Testing Phase

Using a device that forced muscle contractions and uncontrolled jerking, we simulated the experience of our user with sever Parkinson's. We testing both our product and belt and found that our product cut down the time of both taking off and putting on in half.

Nobelt





Belt

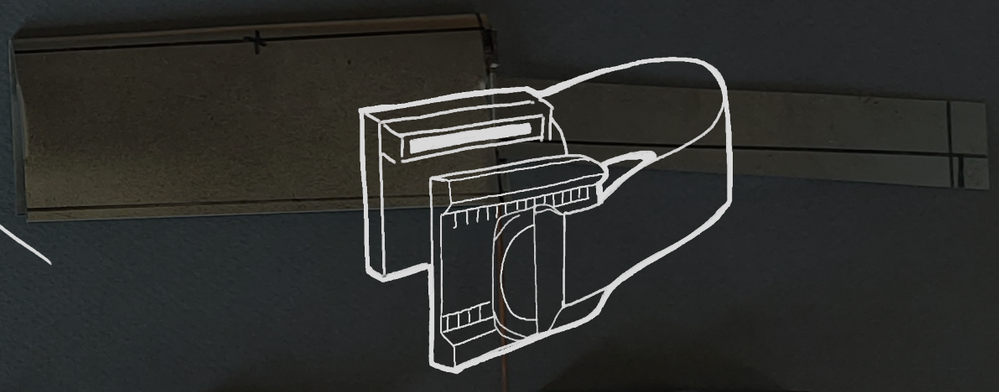
Next Steps

Testing with Users

Return to our users and observe their use and interaction with the product. Take note of any pain points with the product or the experience.

Data Collection and Analysis

Cite and collect findings from user tests and interviews, make note to any changes to be made in the hardware.



Hardware Redesign

Iterate and redesign touch points based off of the response from users.

Urinary Incontinence Alert System

2023

The UIAS is a small handheld device that addresses the issue of nighttime incontinent accidents. This easy to use device will be the tool that stops not only the unnecessary night time checks, but potentially saves our elderly from other disastrous accidents. A quick response from caretakers is the key to reducing deadly nighttime falls when incontinent accidents happen.

Hear Pam's Story

Pam is a nurse at a large nursing home in Narragansett RI where she has worked for the last 5 years. Pam finally has the chance to sit down after her first round of check-ins with the patients on her floor.

Pam loves the people she cares for and always tries to be optimistic and energetic around them. However, due to short staffing, Pam gets moved to the night shift, and her tasks and overall work environment changes.

She will have to be managing twice as many residents as well as covering all of the incontinence check-ins. She hates having to unnecessarily wake up her residents every two hours to make sure there has not been an accident. The people she knew to be cheery during the day were often displeased and irate when woken up.

This had begun to strain her relationship with them and she noticed that with several getting poor sleep, their health had also declined. There must be a better solution, checking on patients every 2 hours disrupts their much needed rest and takes up her valuable time.

Pam is a persona, who's based off of real stories in the Geriatric Care System.

For our incontinent residents we do night checks every 2 hours to see if there has been an accident. We are required to wake them up and get a verbal confirmation from them, and then take care of them should the need it

For your incontinent residents, what are your nighttime care routines and protocols?

What do Stakeholders and Professionals in the care system need?

Donna O.
RN at Wingate Assisted Living

As a
Nurse, Rn or Aid

I need to
Access simple, easy tools to detect patient incontinence

So that I can
Refrain from unnecessarily waking them.

Dr. Nicole Jennings
MD
Primary Care at FJC

As a
Medical Doctor,

I need
my nurses and aids to be available

So that I can
ensure my patients receive the best care.

Kevin McKay
CEO at Tockwotton Assisted Living

As a
Nursing Home CEO

I need to
Find affordable, effective solutions and tools for the needs of my staff and residents

So that I can
grow my care facility to house and treat more elderly patients

How might we create a simply, accessible tool to detect Urinary accidents in real time?

Usage of Body Safe Moisture Sensing Technology

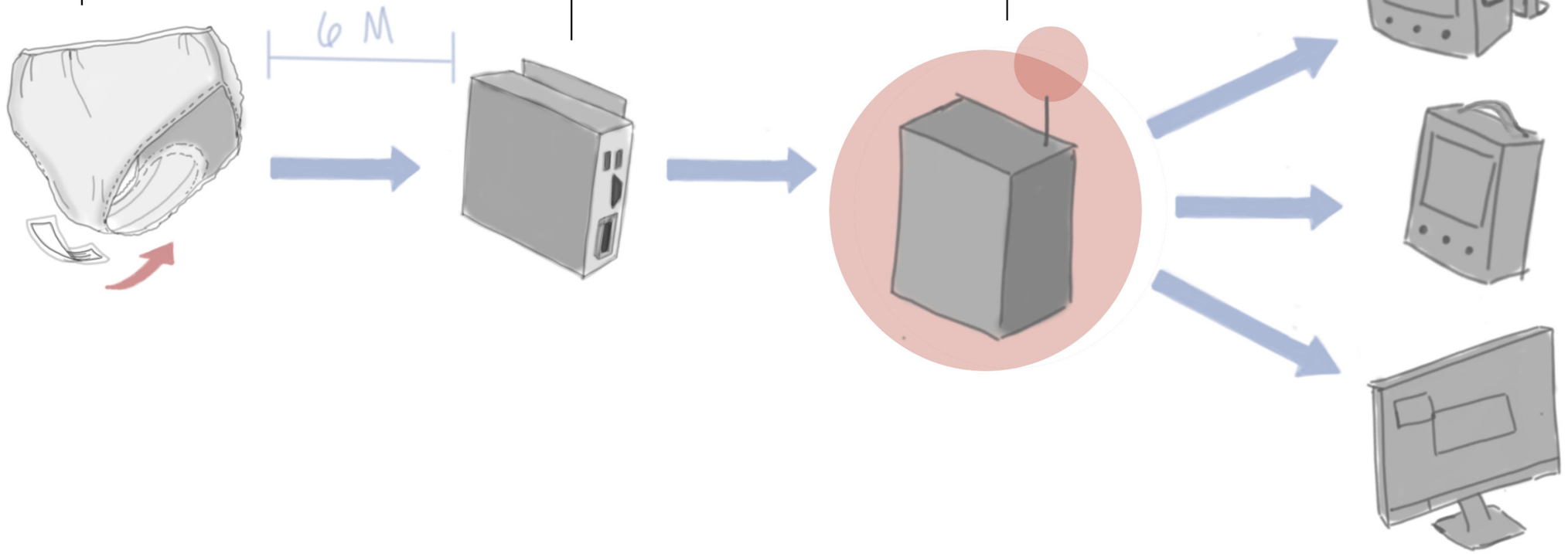
To address bladder leakage in real time, I first started researching existing moisture sensing technology that could be used on the body. This company, AXZON, had already developed a proposal on this using their product, but upon further investigation, the report had many “holes” .
Read the proposal and learn more about Axzon’s product and specifications on hardware here.

1. The Axzon body safe adhesive moisture strip is placed on clothing around the groin area, it does not need to be touching the skin to work

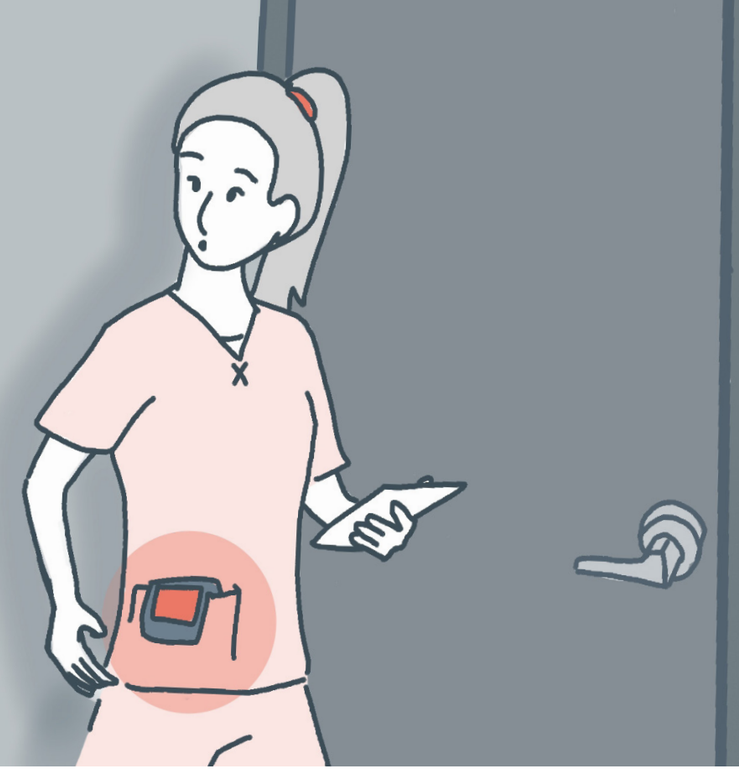
2. Each room with a patient will require a reader that communicates to the sensor strips via HRF. This must be within 6 meters of the strip to work.

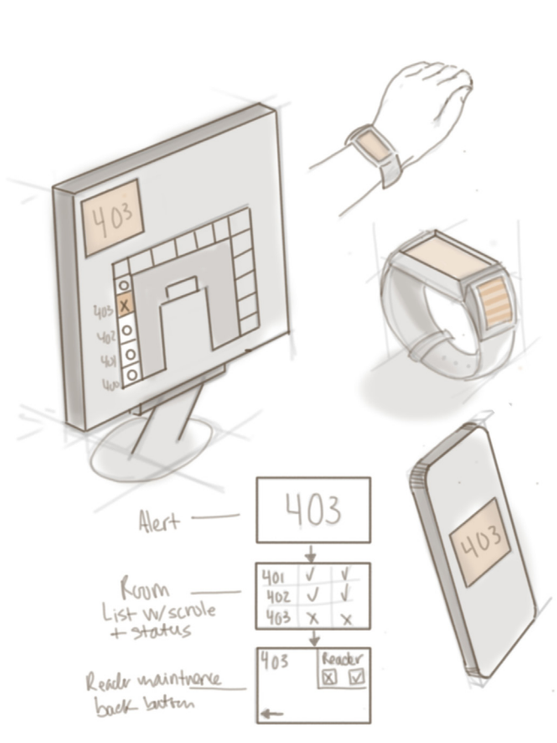
3. Once a sensor detects moisture, the reader if connected to a facilities network, will send out a signal

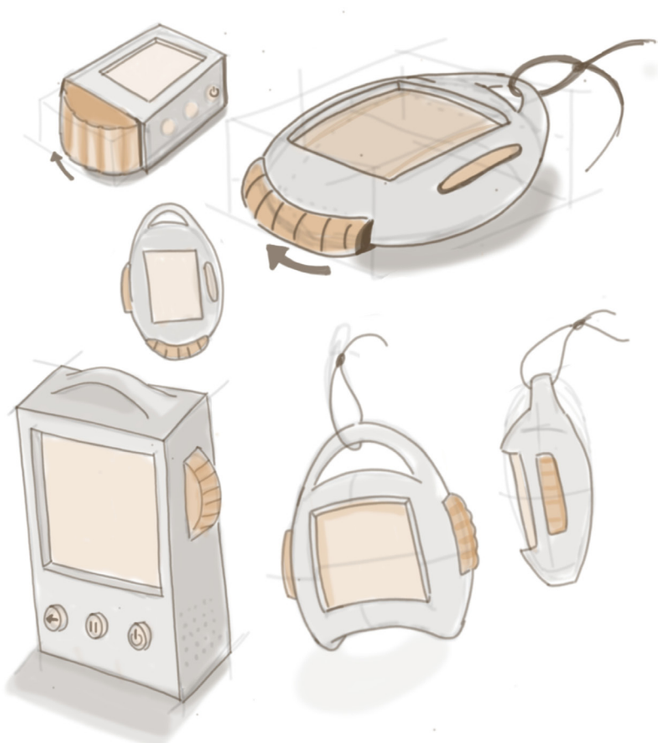
4. Then, whatever devices are on the network connected to the reader, will receive an alert of a real time incontinence accident.

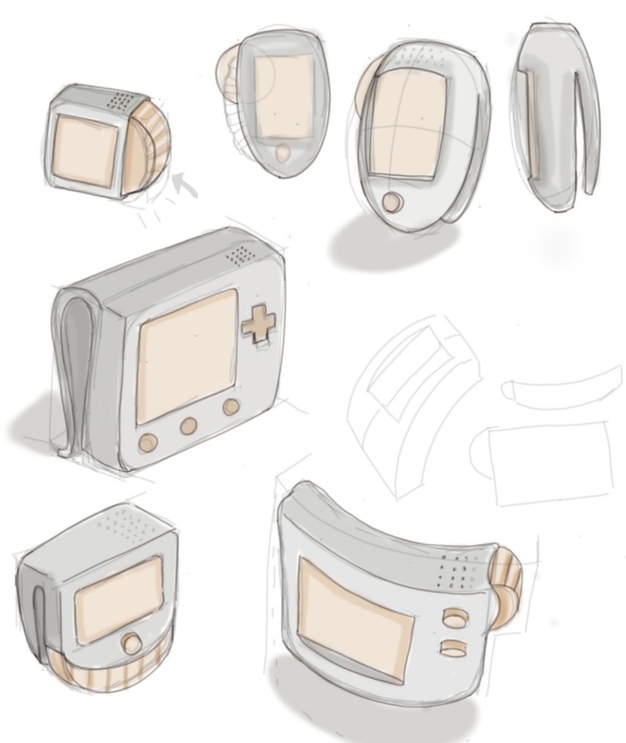


Use Cases and Sketches

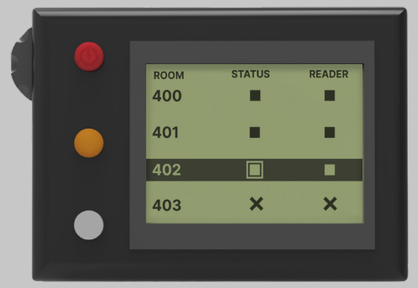








Action 1: The Alert



1

The UI will show a basic list of connected rooms and show their status. This active alert is show an active status in room 402

2

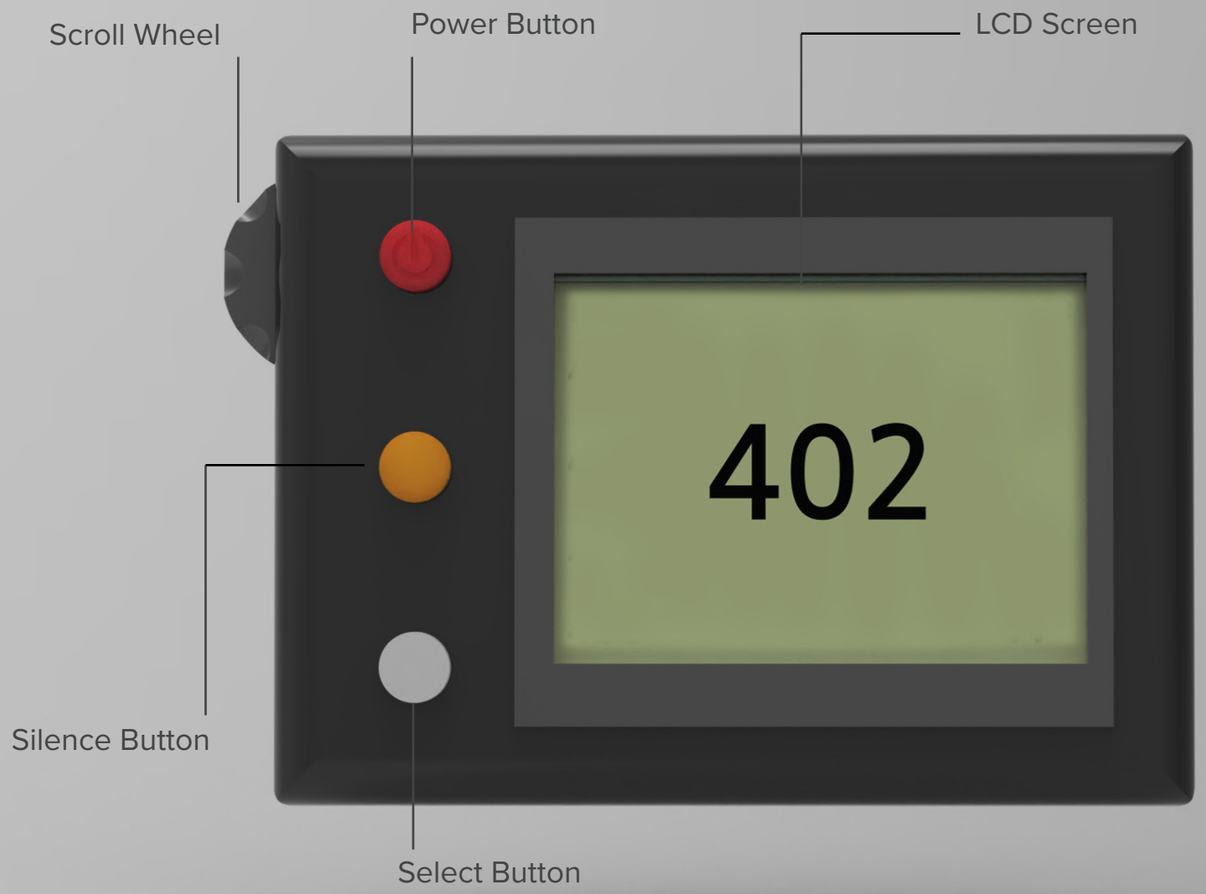
Once the room is selected, the screen will show that there is a positive moisture status meaning the sensor has been activated

3

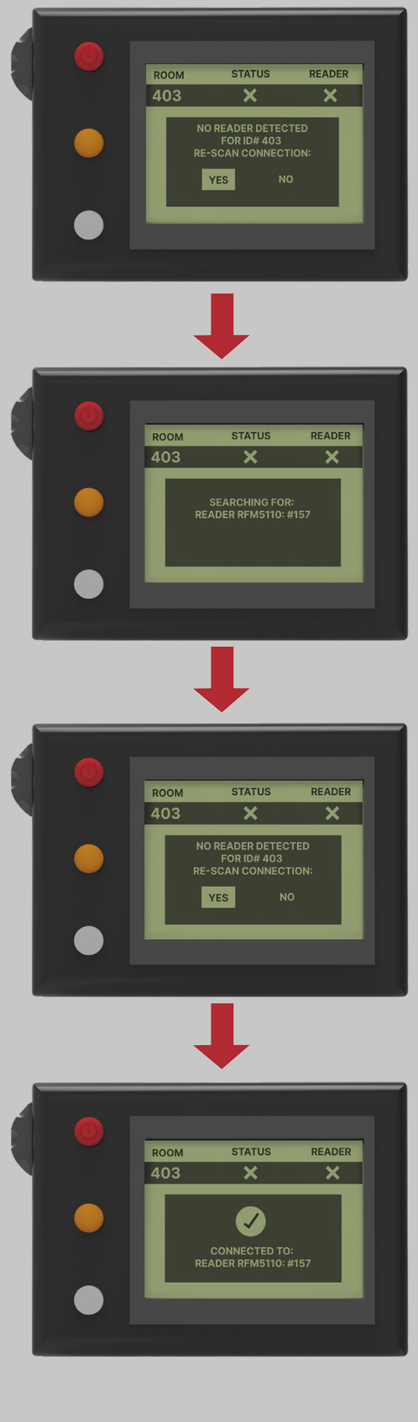
Once the patient has been addressed, the user can select the top bar to clear the positive sensor status

4

Once everything is reset, the user can go back to the main screen by hitting the back arrow



Action 2: Hardware Status

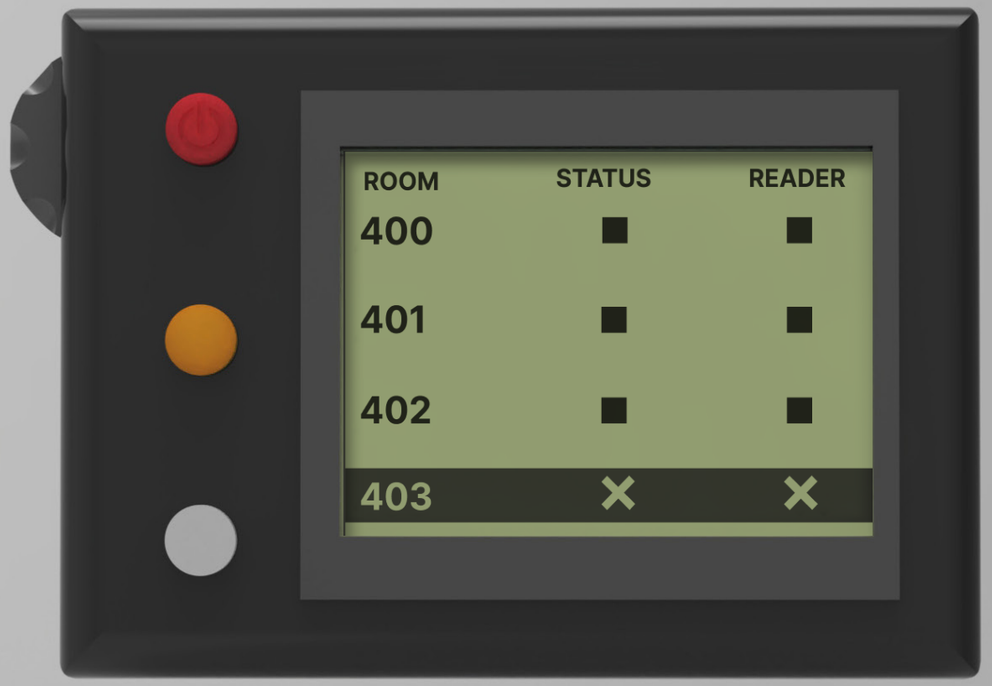


1. When the screen shows a reader is off line, the user can select that room to view and reset the reader and device

2. Select for a rescan of the reader in the room to make sure the reader is connected to the network

3. This device can be used to indicate when maintenance may be needed on the hardware

4. When the reader is fixed and back Online, the device will pick up it's signal and that room's sensors will work again.



Now that Pam uses the UIAS...

“Beep Beep” Pam hears her UIAS pager go off, she then knows she is needed to address one of the patients.

She hits the orange button once to silence the alarm sets aside the pile of forms she was able to finish. She checks her UIAS and sees the blinking 375, and begins to quickly make her way there.

Knocking and alerting the patient to her presence, she enters and goes to the bed to assist. Once the patient has been successfully cleaned, she places a new adhesive sensor in a new brief for them. She takes a moment to clear the patient alert from her UIAS.

She checks that the patient is well and has put on the new brief before letting them return to sleep. Pam is happier she now has a more pleasant experience during these incontinence checks. Only having to wake and address the patients when needed has given her more time to do other tasks and allows her patients more time to have healthy rest.

Reviews from the Users

Once a UI test and a small scale model were developed, the product was brought back to the assisted care facilities and was tested with Nurses and Nurse Aids for their review.

“Being able to help the matter of incontinence is one thing, but addressing the root of why someone might get up at night and fall in the first place is the bigger issue this device is addressing. It’s not just saving sleep and underwear, it’s saving lives.”

Measurement

Each of the Interviewed nurse staff were asked to rate the device on understanding, ease of use and installation and

8.5/ 10

Average score when asked on a scale from 1 to ten how easy it was to understand the interface. 1 being difficult and unintuitive and 10 being very easy.

Process of Installation

Rated highly for how accessible and easy the installation could be into their facility.

90%

Said they could see immediate use for the product at their facility.

Thought that a third function, which gave the nurses the ability to “bump” their alert to another if they were unable to attend, was a good idea.

Next Phase

The next phase would begin with another round of interviews for patients that would be interacting with the product. Out of scope next steps would be to establish a protocol for any sensors that are faulty, as well as begin thinking about more sustainable approaches to addressing real time incontinence accidents.

Faulty Sensors

Prepare a protocol for potentially faulty sensors

Sustainability

Incorporate more sustainable, less disposable methods to the system

Test with Patients

Bring patients into the ecosystem and get their thoughts on the product

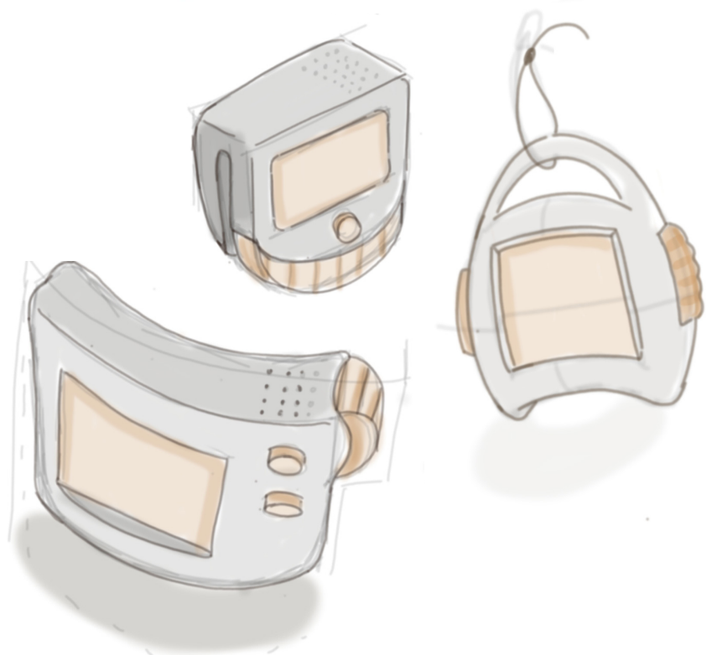
Explore Patient Sharing

Ability to send alert to another nurse if you're unable to tend to the patient

Revisit the Form

After testing the concept with the users, the next immediate step is to revisit the form of the product and hone the user interface. Establish touch points and finalized necessary features.

The next step following would be to establish a UI for the task of the Patient "bumping" feature discussed in interviews with the users.

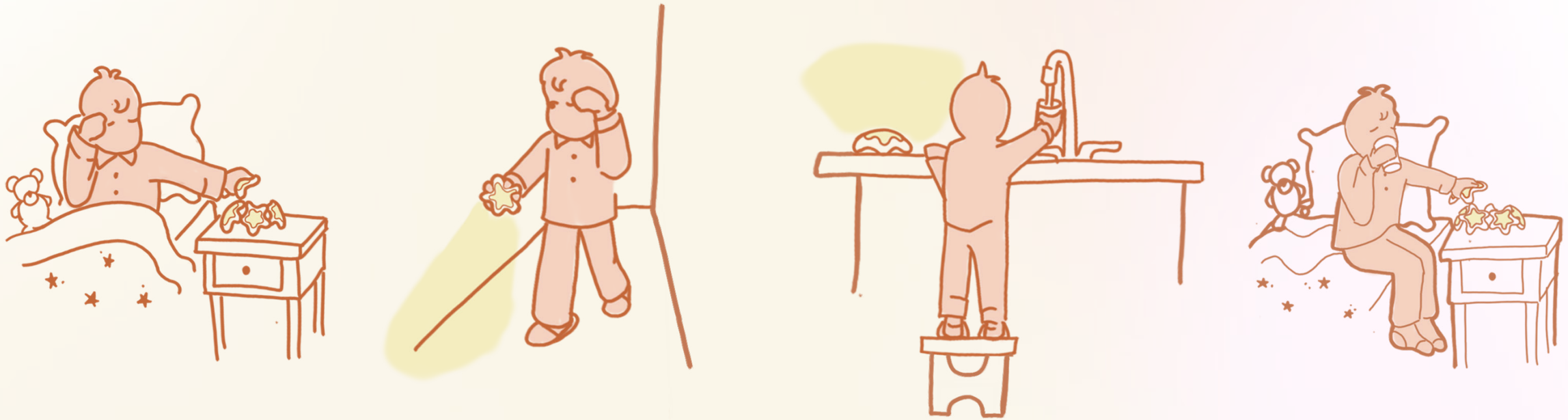


Twinkle Tots

2021

Twinkle Tots brings comfort, safety, and play to a child’s nighttime routine. This six star module light when all connected together creates a warm, dim nightlight to provide a feeling of warmth and comfort to the dark bedroom. However, when the need to wander in the dark arises, one of these stars can be removed from the group automatically becoming a bright guide light.

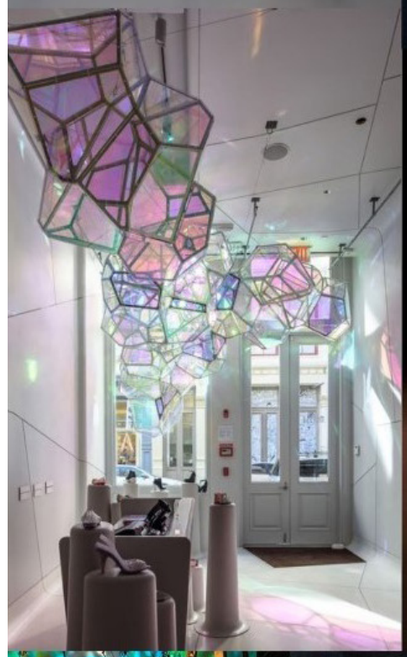
A little something for the nighttime adventure...

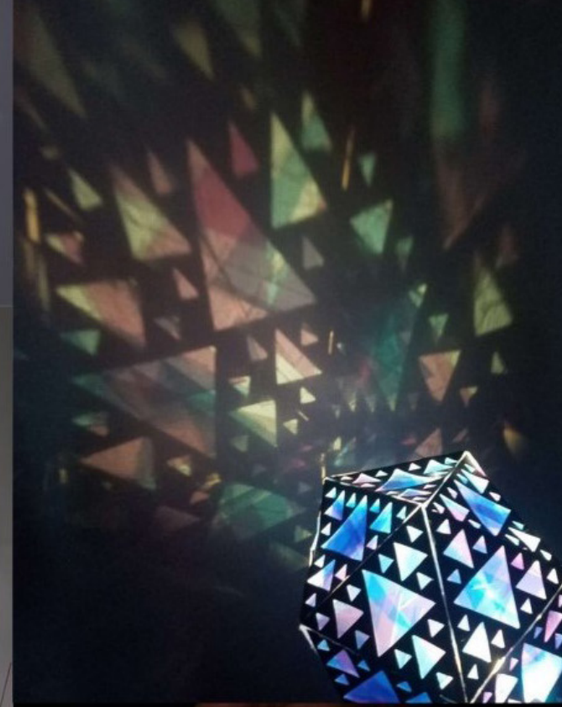


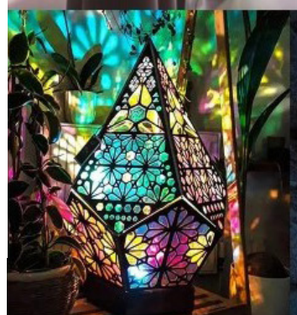
Sketches and Mood Board

Themes:

Linearity/ Modularity/ Reflection
and Shadow/ Geometrical Fit



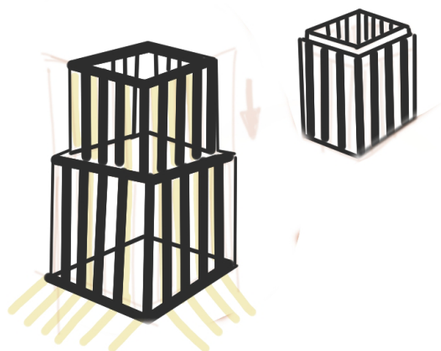




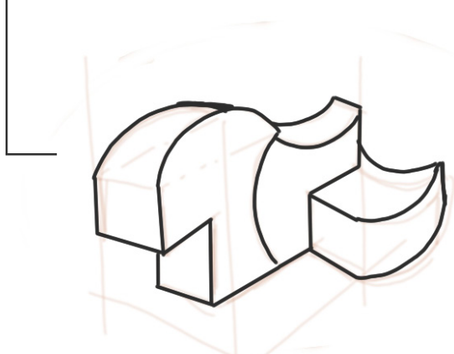
Sketch Models

Linear design interior lighting to create out-glow effect

Nesting and folding back into the form

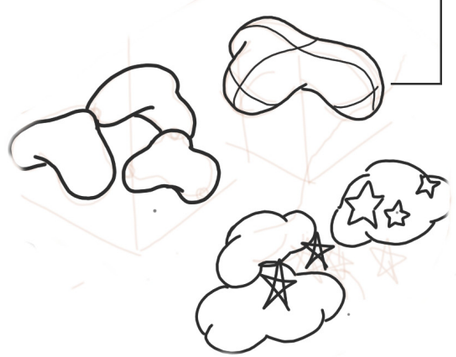


Single repeating module design



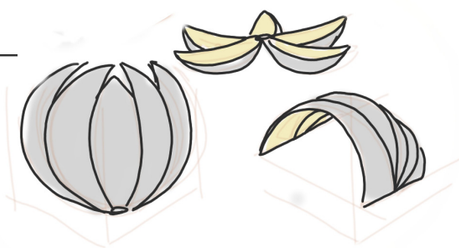
Geometric shape that could come together to create a cohesive shape

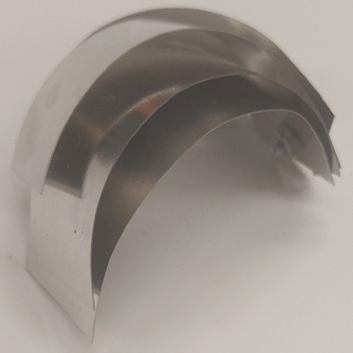
Explored a star shape design



Floral petal design with interior lighting to create out-glow effect

Unfolding and hinge adjust-ability



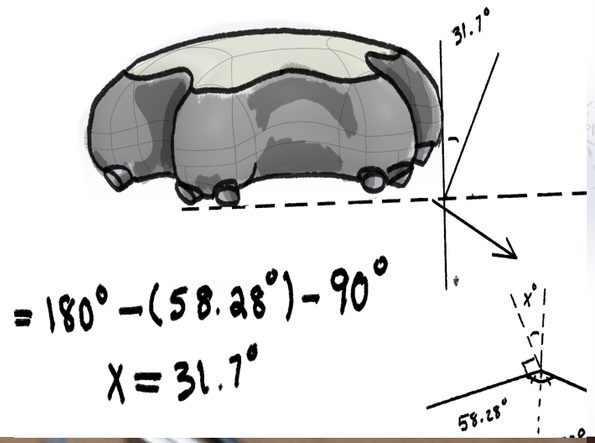


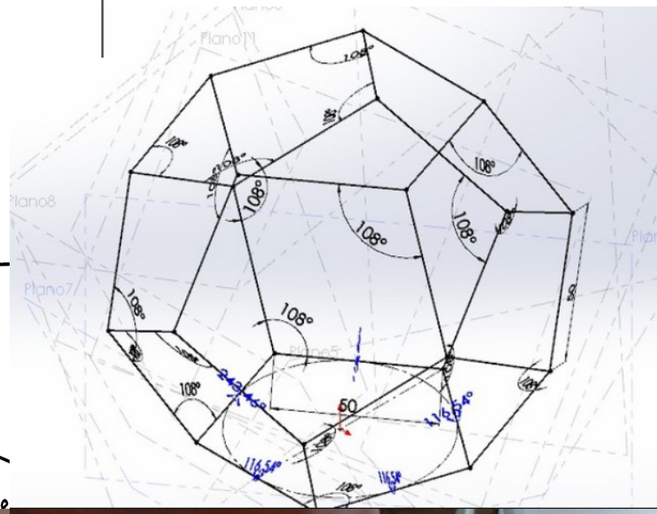
Building the Product

After deciding to move forward with the star design, I wanted to have all the parts fit together to sit in a half dome shape.

In order for all the modules to fit together as intended, geometrical study was a big part of the model making process. I had to come up with a formula for calculating the correct angle at which each star would intersect in order to essentially create a dodecahedron. After that, the magnets used inside the model had to be placed very specifically in order for each to match together.

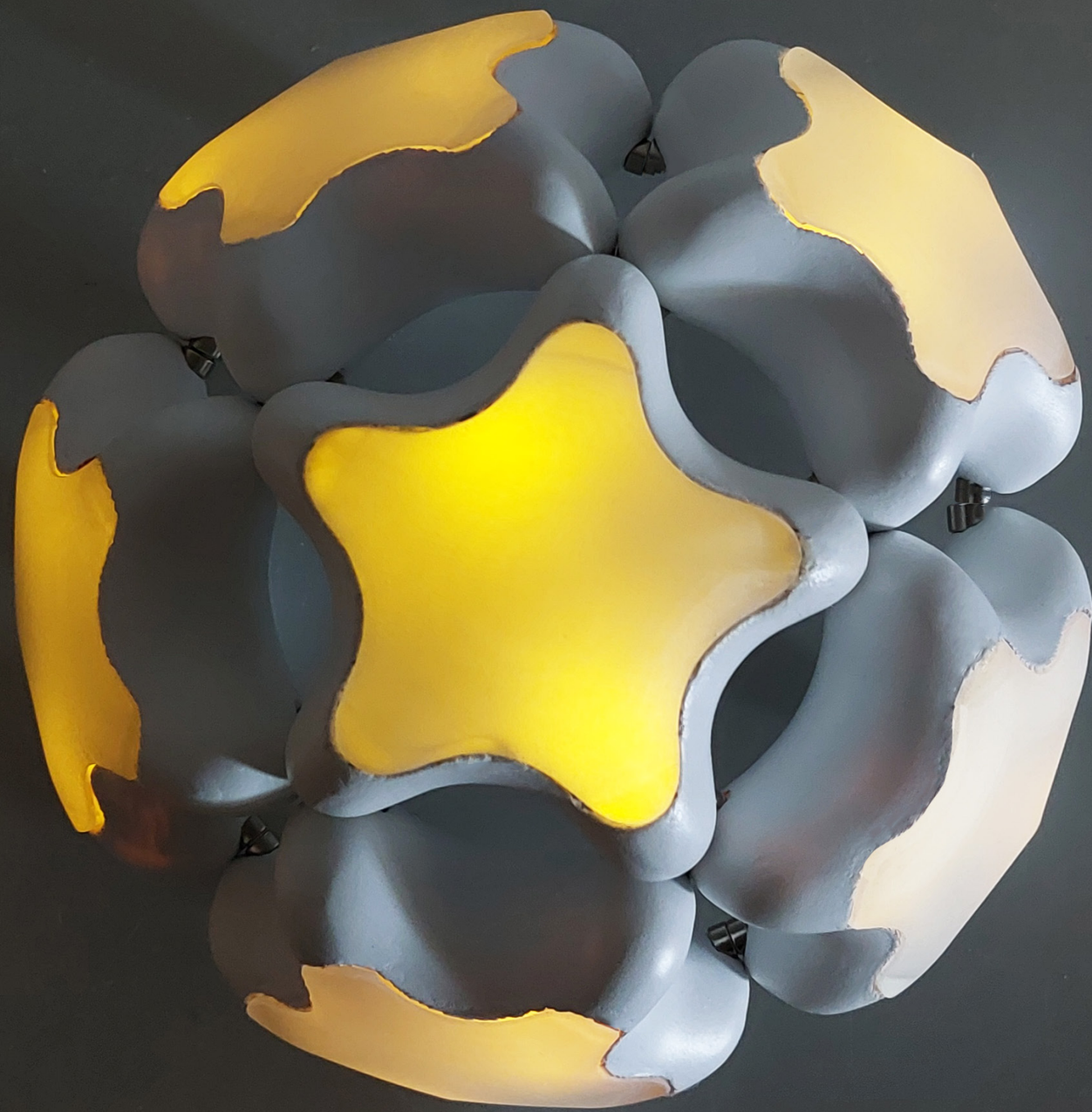
Dodecahedron shape allows for 5 pointed hexagon star to create a domed shape





Final Product

The Twinkle Tots light is a small night light that comes together in 6 modules. All connected, the lights dim to a cozy night light, but once one is removed it becomes a bright hand light to be used for practical use.



END