

Og week

Overview

Things to do 3

- keep drawings concepts

- to help consider the CFM considerations, ergonomics, user experience, needs and wants of product - try prototyping and try out the shape - especially for hand held device

- need to apply different 'detail considerations' to the concept sketching - iterate concepts

Questions to Ask 3

- how should i incorporate the reminder device

- how should different functions interact and impact each other

- how can i best adopt 'context' - considering home context, kitchen, fridge, and bathroom

Lecture

Symmetry

- need to think about what your target demographic wants and what would suit them

Aesthetics

- material selection is pivotal to the final aesthetic outcome of the design
- form, proportions, material, surface finish, colour, edges/ transitions
- texture - CMF

User needs, wants, experience

- consider user comfort - material considerations- look at the softness of the components that touch the face

Words to consider

Emphasis	unity / variety
Pattern + rhythm	Contrast

Form details are important

- consider what kind of cord you want to use and what that will look like

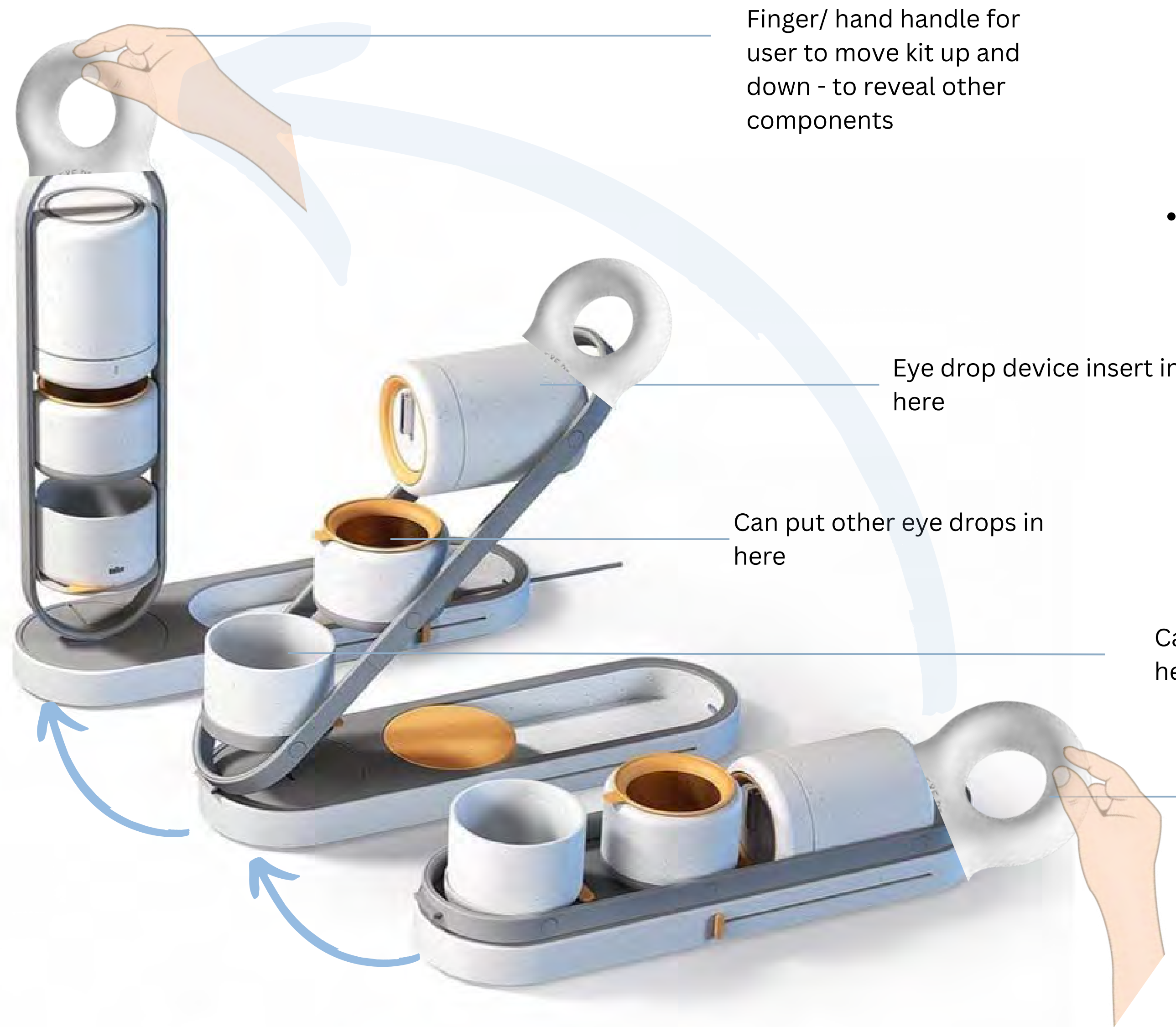
different detail concepts

- buttons, hinge, lights,
- blues, greens, whites - medica context

Form Aesthetic



Concept - Context Consideration



Finger/ hand handle for user to move kit up and down - to reveal other components

i like that it doesnt look medical

- makeup look - familiar

- there can even be another component to put in user's other pills and medication

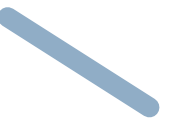
Eye drop device insert in here

Can put other eye drops in here

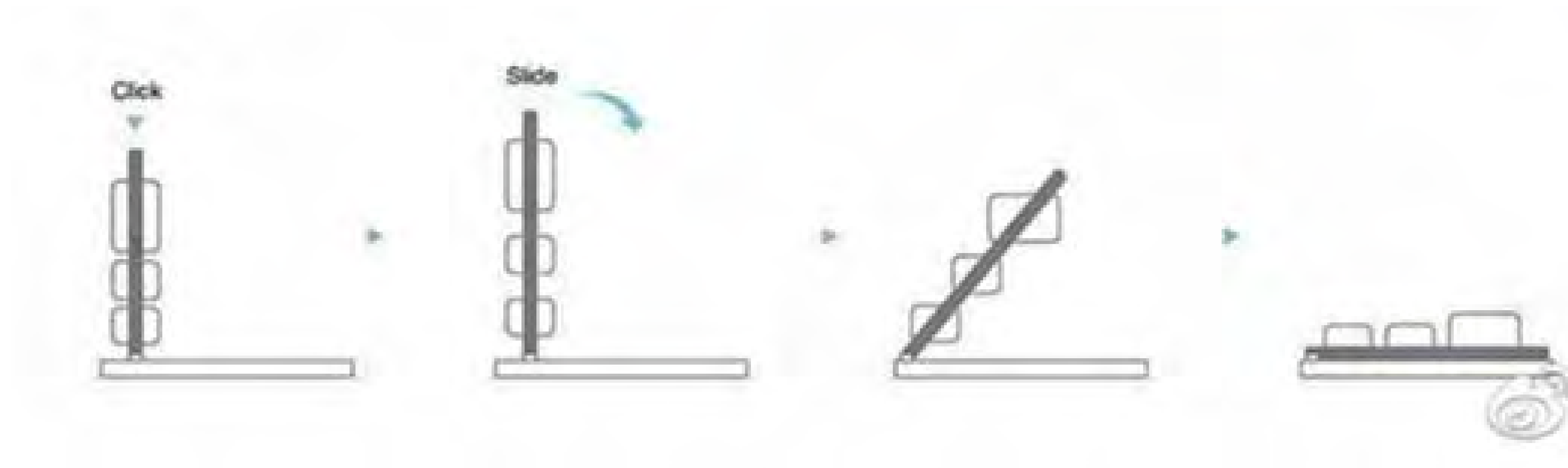
Can be reminder clip in here

this component can hang in bathroom and kitchen context too - can hang on fridge, near tooth brush etc

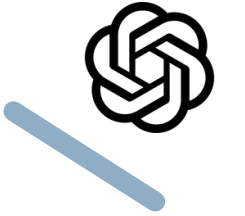
Concept - Context Consideration



Movement form of kit to
avoid looking clinical



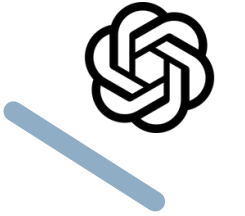
Concept - Context Consideration



CHAT GPT - SCREEN ITERATIONS



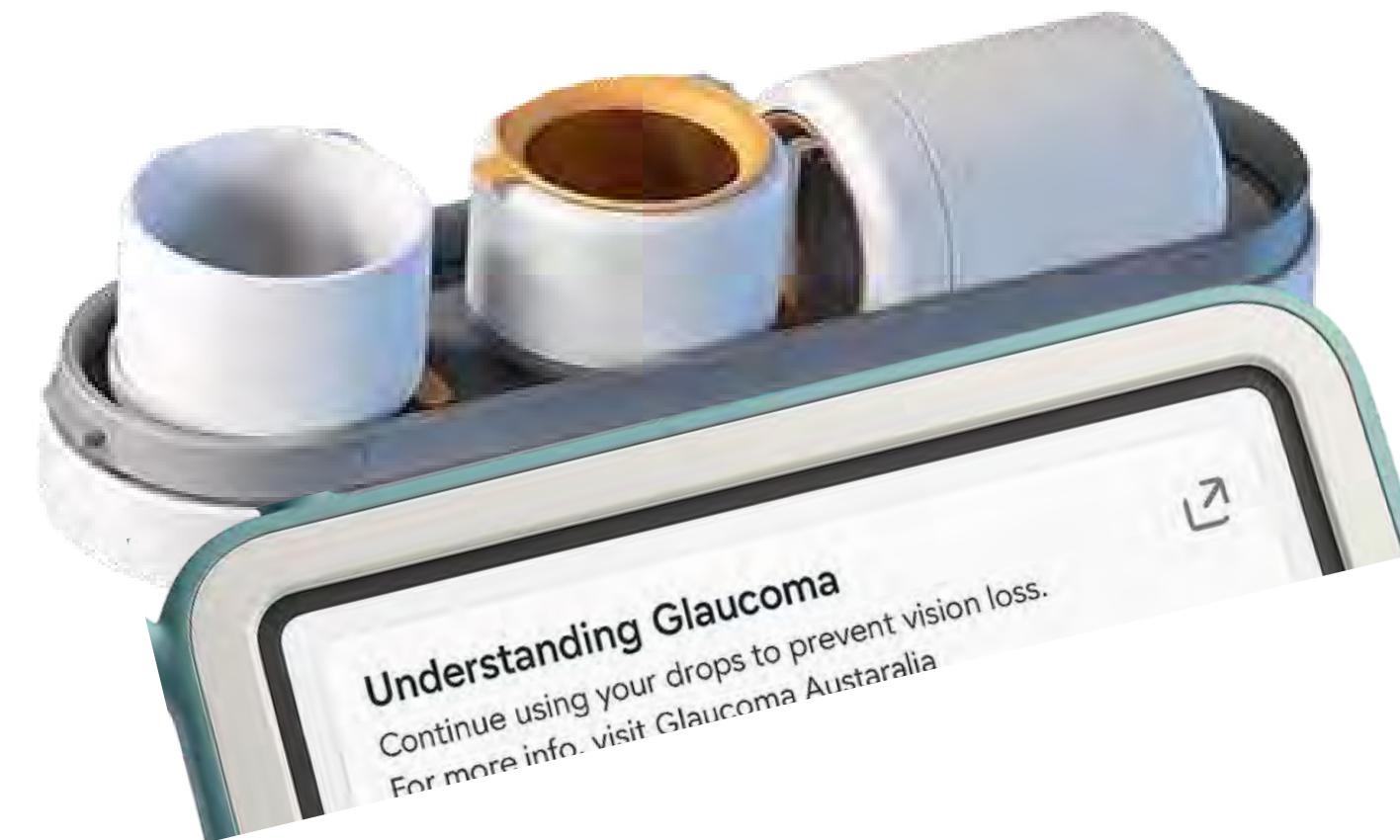
Different Eye Drop Bottles



1.IDEA 1 - WITH SCREEN



1.IDEA 2 - WITH SCREEN



1.IDEA 3 - WITH SCREEN



Material - Silicone for Eye Cup



ergonomic positioning of the
eye the goggle cup has



Material & Familiarity



position
movement is
easy and
functional for
user -
familiarity
design
principle

Material - Silicone



ergonomic positioning of the eye the goggle cup has

- comfort
- functional
- silicone material choice
- familiar to user

Eye Shape

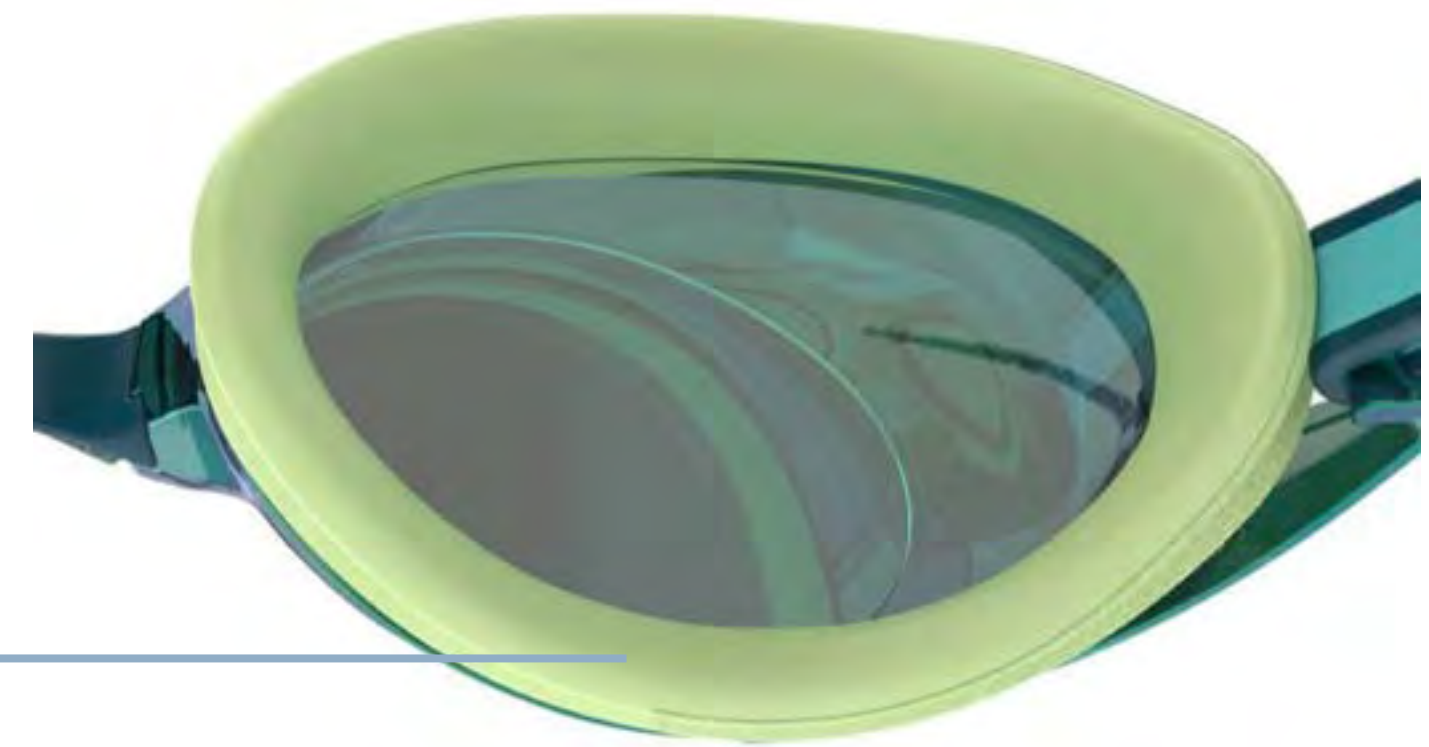
**Speedo Adults Biofuse 2.0
Polarised Goggles**



Thicker
support of
the eye



**Speedo Adults Vanquisher 3.0
Mirrored Swim Goggles
Emerald OSFA**



Thinner
support of
the eye



Ergonomic Eye Shapes and Goggles



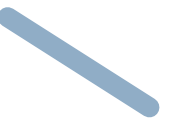
Eye goggle cup suit
different male face
shapes with comfort

Ergonomic Eye Shapes and Goggles



Eye goggle cup suit
different female face
shapes with comfort

Ergonomic Eye Shapes and Goggles



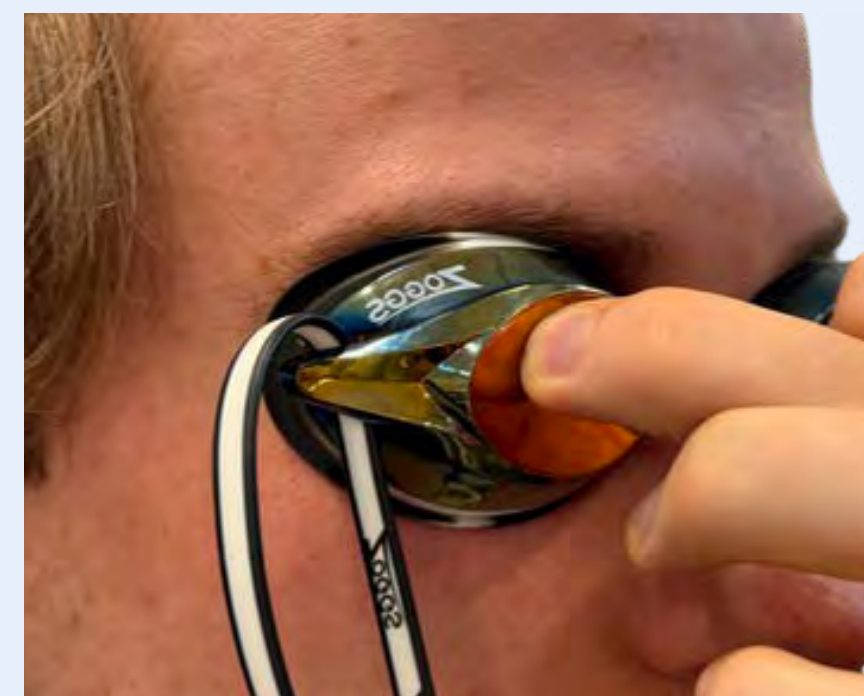
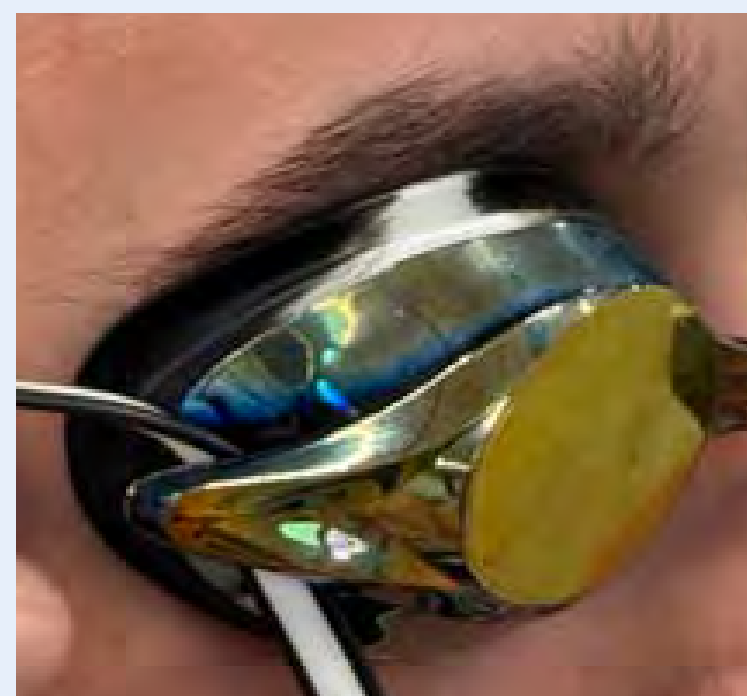
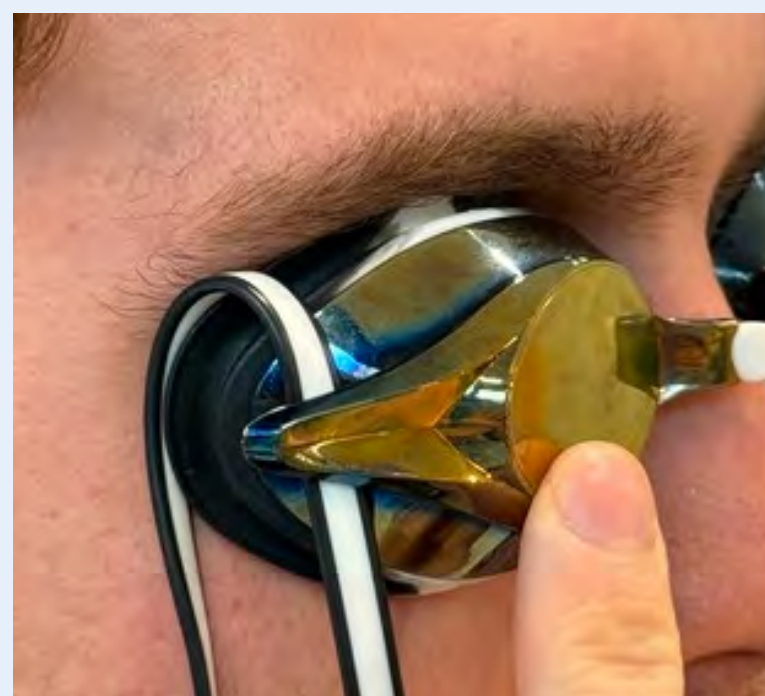
Eye goggle cup suit
different male face
shapes with comfort

Ergonomic Eye Shapes and Goggles

Female



Male

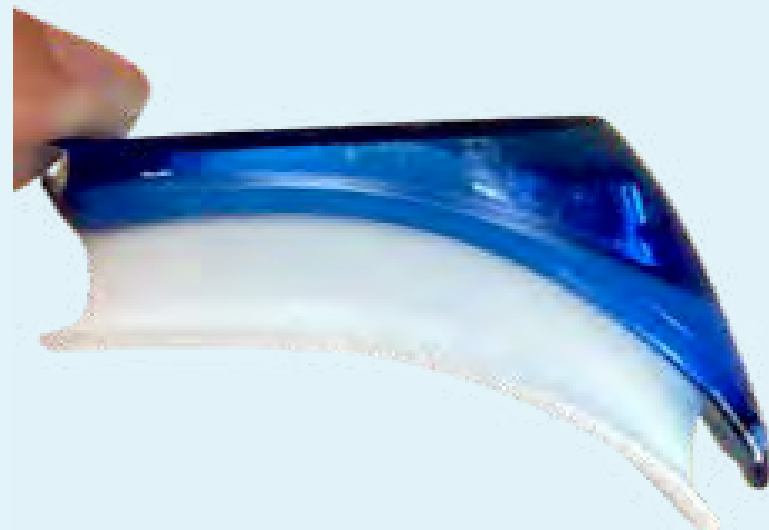


Goggles Eye Shape

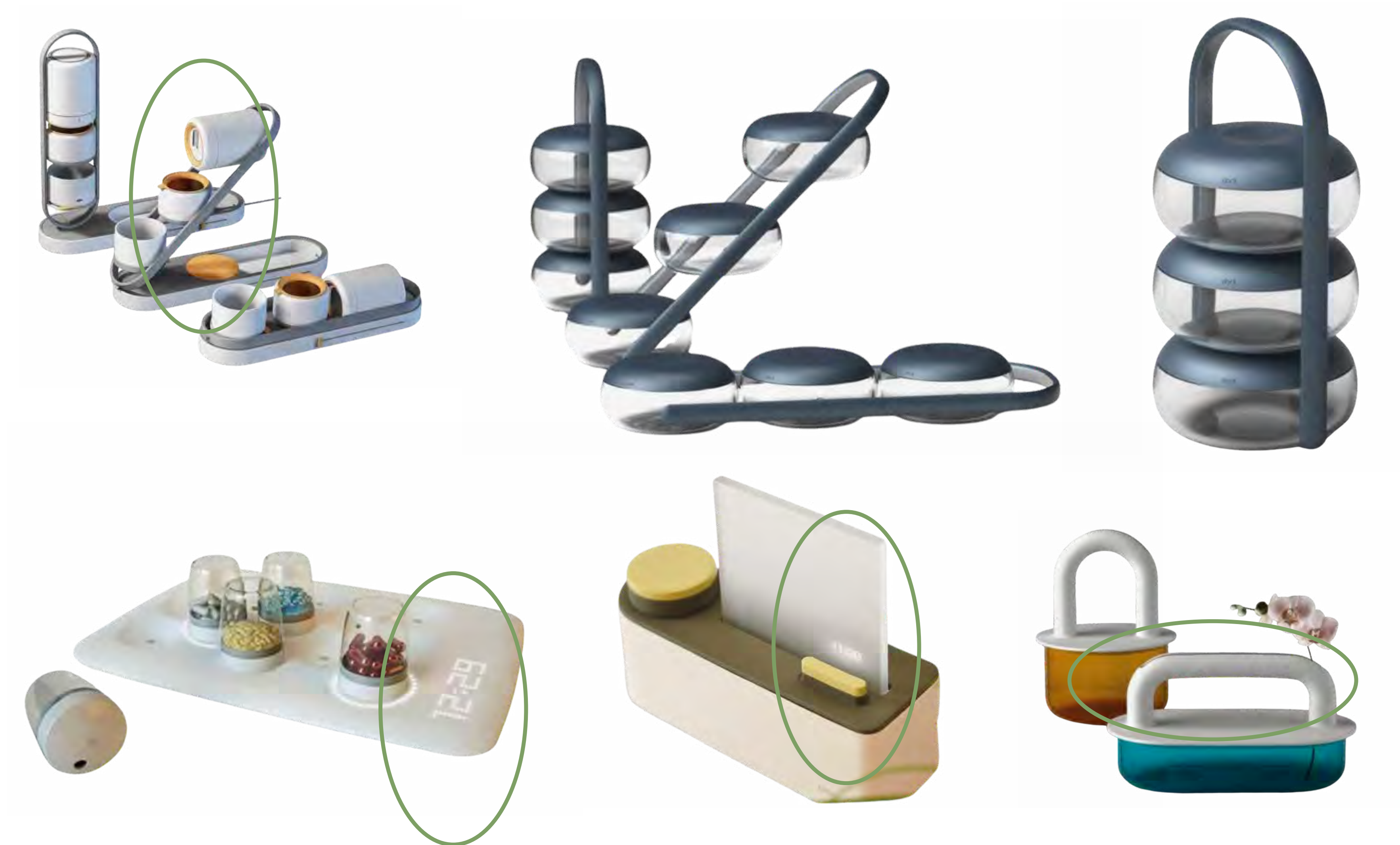
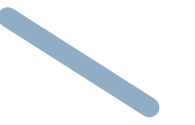
goggle shape 1



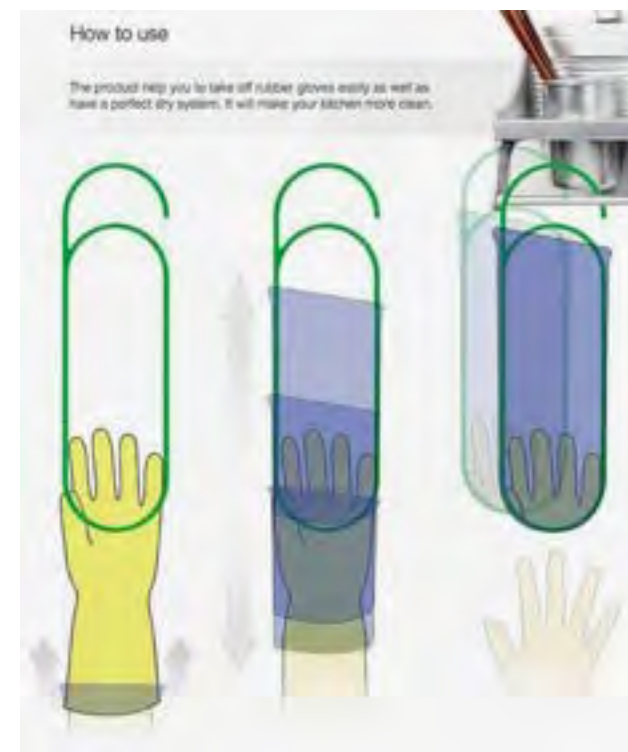
goggle shape 2



Kit Experience & Shape



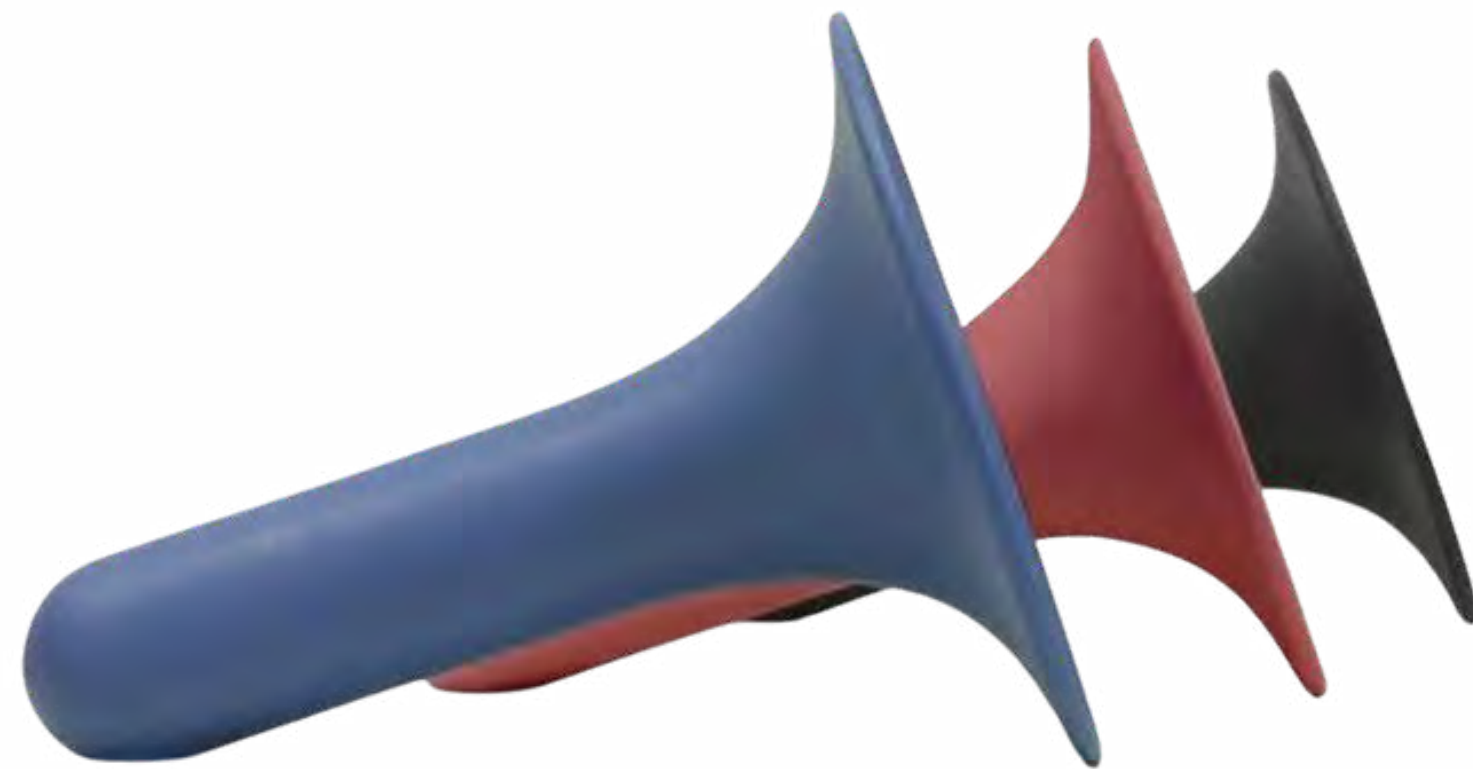
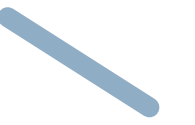
Kit Experience & Movement



Administrator Handle



Administrator Handle



Administrator Handle



Administrator Hand Support



Summary of Features & Adherences

Emotional & mental adherences	Physical Adherence
-------------------------------	--------------------

Reminder -forgetfulness - scheduling	Vibrational reminder device • can attach to the back of the administration device Reminder to discard the drop once it expires Progress chart
Trusting process - Side-effects - Self-care - Shame	Streak count of how many times eye drops have been administered • how many eye drops have been adminstered, if eye drop has not been administered and future eye drops that need to be adminstered for the day
Education - Confirmation - Communication with optical professional	Education reminder/screen • communication to the healthcare provider • reminder of the symptoms of eye drops regime - e.g the glaucoma eye drops will sting • send the patient to the gluacoma dry eye website • provide tips for administering eye drops in more accurately and at what angle • a poor understanding of their condition (eg. lack of symptoms and not understanding the potential blinding impact from glaucoma; misunderstanding that the drops “cure” glaucoma and that they can therefore stop using them once they have a positive response in intraocular pressure • “Poor adherence to administering eye drop medication means increased eye pressure and risk of progressive loss of your sight.” • Stay motivated and take your glaucoma treatment and medications seriously.
Empowerment/ Dignity - Empowering - Encouraging -Embarrassment	Context of the product • designed for kitchen and bathroom use Praising the user • reminding the user that eye drops are a journey and help their vision and prevent blindness

Summary of Features

Emotional & mental
adherences

Physical
Adherence

Useability - Seamless - Squeezing Strength - Simplicity - grip	Grip of handle comfortability of support thing on eye rubber support handle on the device for users with low grip strenght, arthritis, parkinsons
Accuracy / stability - Stability - Shaking - Success rate	Ensuring to the user that they are positioning handle at the correct angle • light display -1/3 of light around the eye drops, then goes 2/3 then goes 3/3 and that allows the patient time to get the eye administer at the right angle - and what it is at the right angle then its ready to administer
Aesthetic and Function - context design (e.g. kitchen, bathroom, fridge magnet)	Kit to store everything • e.g. kitchen, bathroom, fridge magnet) Travel • being able to disconnect and package just the administration of eye drops device
Multiple Eye Drops - interchangeable mechanism	Interchangable mechanism to allow patient to swap out different eye drop bottles

Breakdown of Products



A. Eye drop Adminstrator	1. Ergonomic Handle shape 2. Eye resting component 3. interchangeable eye drop bottle mechanism (pivot twist open to refill) 4. eye drop bottle push mechanism - to extract eye drops from the bottle 5. Lights surrounding the eye drop bottle for the patient to see when the eye drop is ready to be administered 6. touch button for altering and administering push of the eye drop bottle - with administering symbol as signifier 7. soft rubber texture of handle to signify to user where to hold 8. Soft rubber band that wraps around hand and attaches to administer for stability and gripability
B. Context Kit	1. Acrylic Screen with LED light - Progress chart - Reminder to discard the drop once it expires - communication to optical professionals - education on the condition and side effects of eye drop medication - encouragement words - day by day administration of eye drops streak 2. Home Decor Case - hangs on a clip in the bathroom - ring shape for the handle - flat bottom surface to put in the bathroom - ring shape on the edge for the user to open the case kit - magnetic attachment so that the patient can remove the administrator device from the kit and use it as a travel component - top component is for the handle administrator, second is the different eye drop bottles, third is the wearable reminder vibrational device
C. Reminder clip	1. Vibrational reminder device can attach to the back of the administration device

A. Hand Holding Types & Sizes

Width = 4cm
Lenght = 2cm



Width = 5cm
Lenght = 4cm



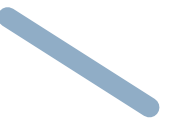
Width = 5cm
Lenght = 2.5cm



Diameter = 6.5cm



Eye Drop Anxiety



How to design for reducing a patient's anxiety with administering eye drops, considering blinking and allowing things to go into your eye is a natural reflect to close them and blink. how to i design for this experience to reduce someone's anxiety with blinking

Upcoming Challenge - for patient experience

- reducing the amount of times a patient blinks when puttin in eye drops

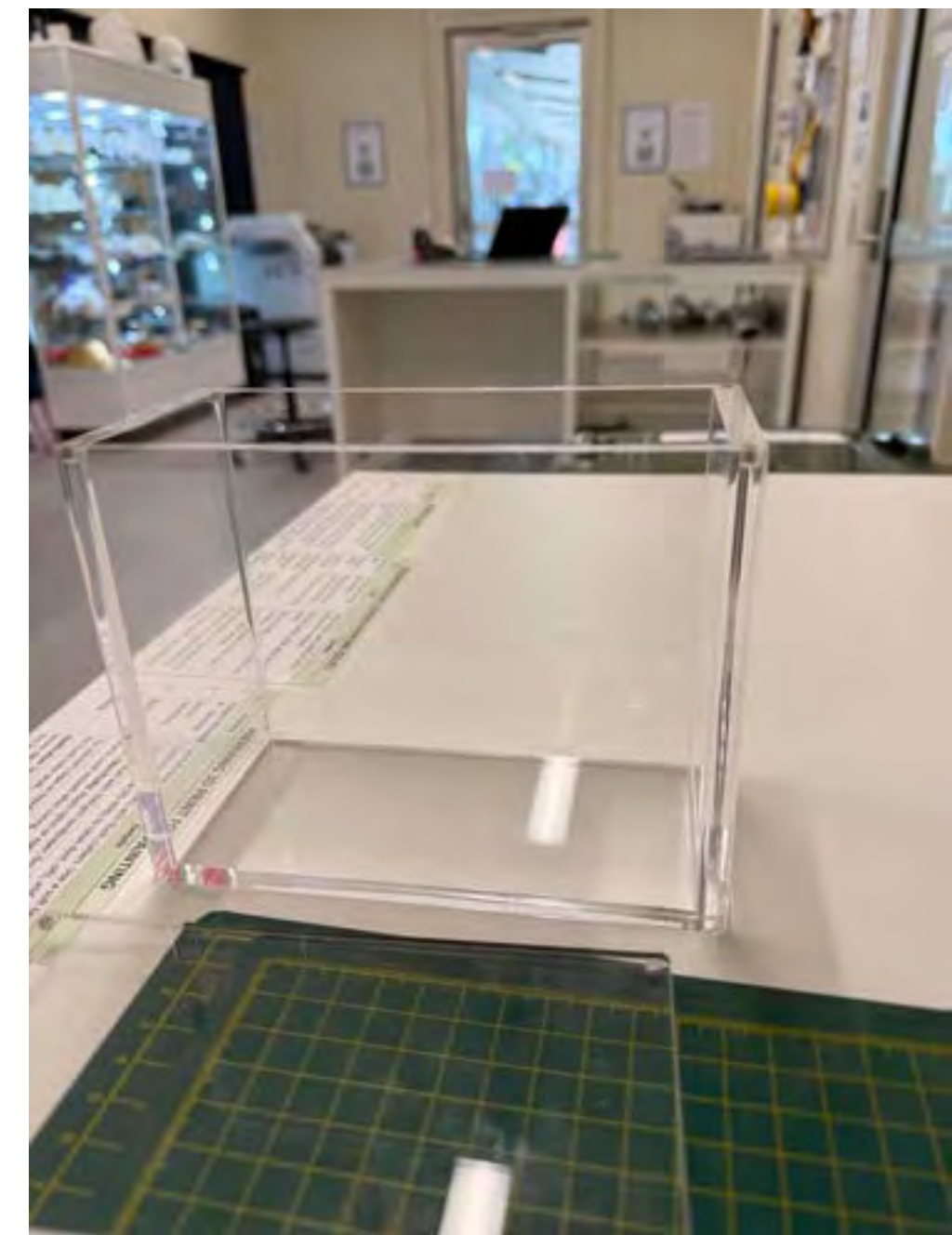
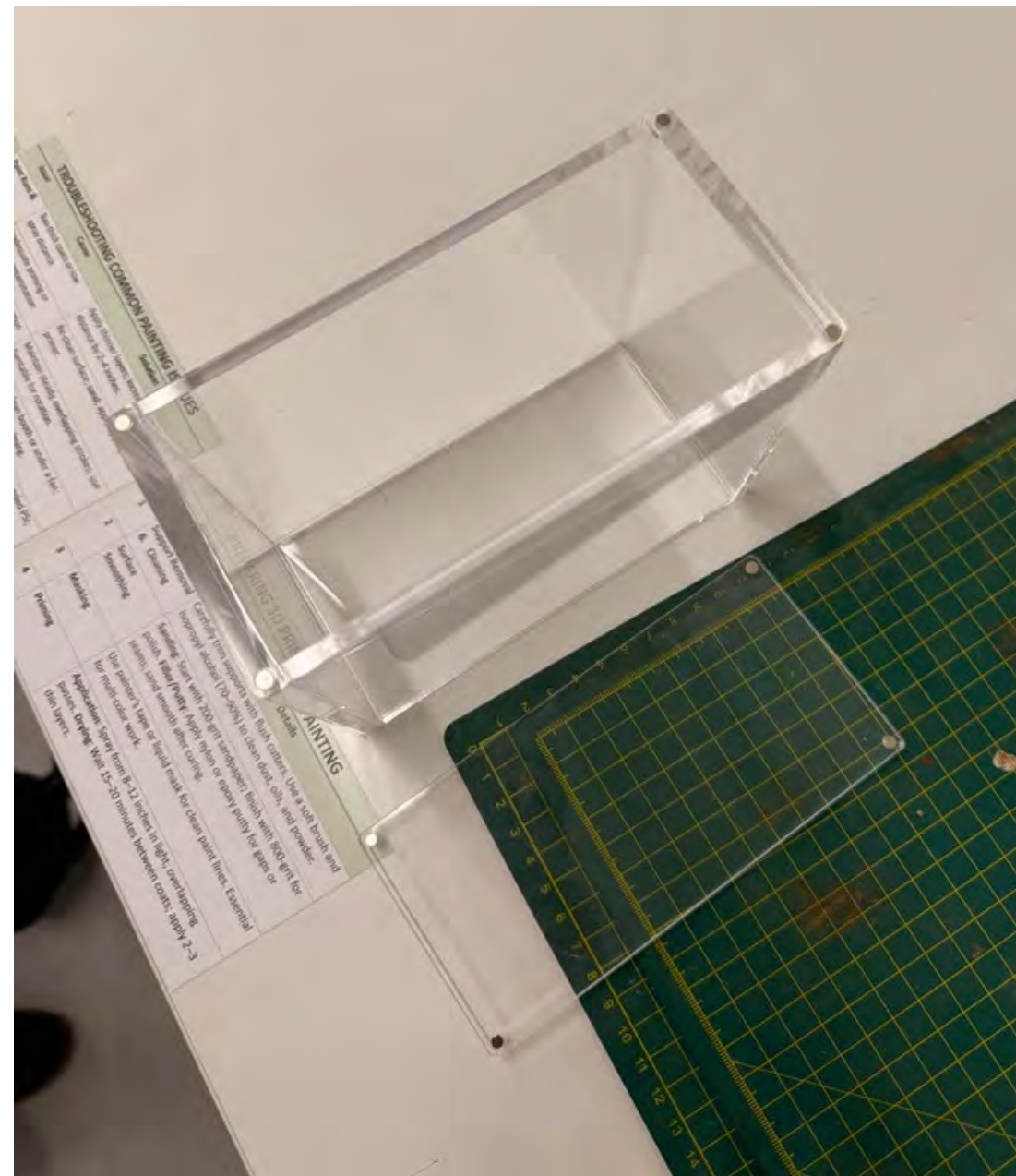
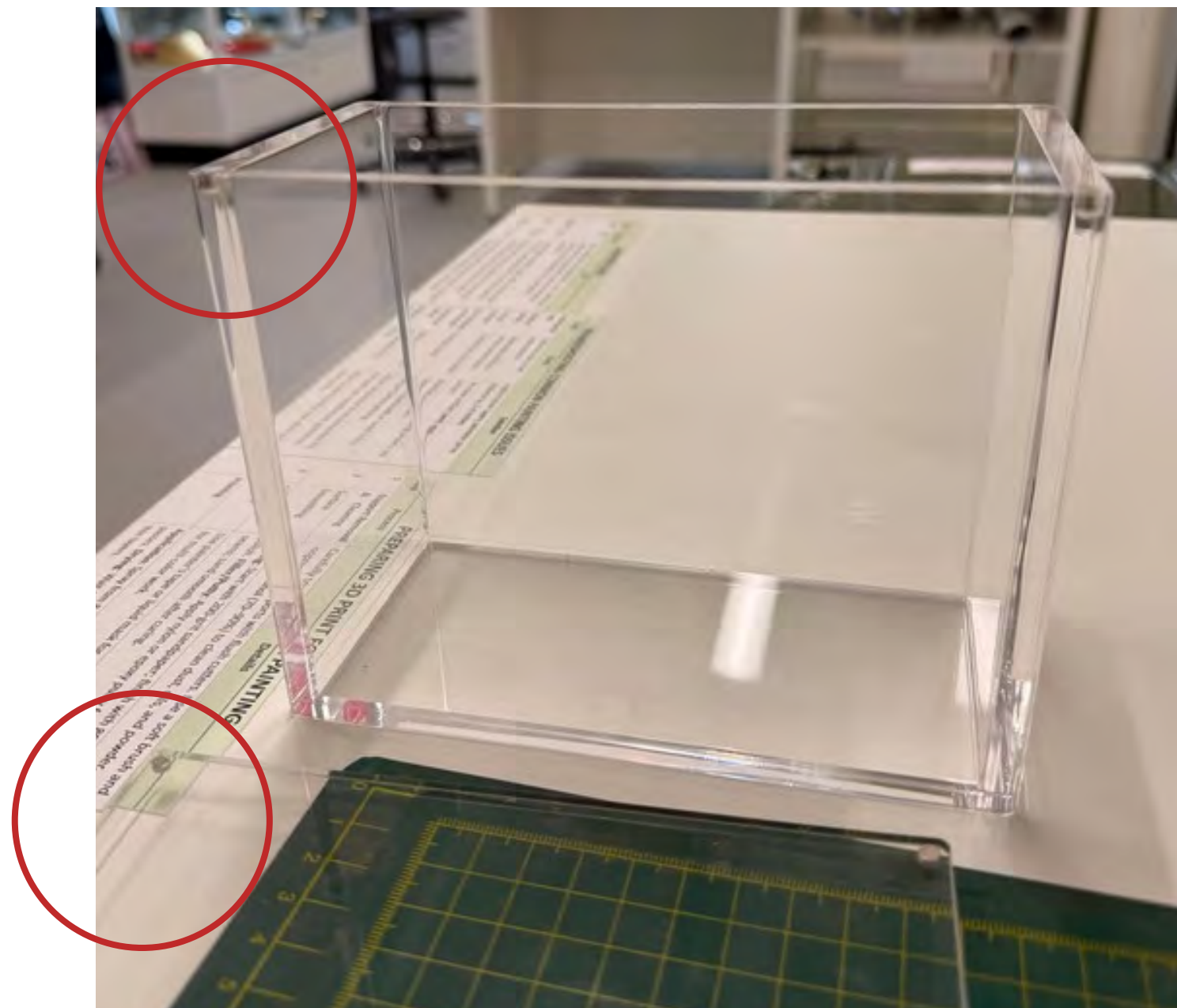
Solutions

- Provide a countdown for the patient so they are ready for the eye drop
- The device somewhat pries the eye open so the eye drop can get in
- Micro-haptic cue: a gentle pre-drop vibration primes the user; then a distinct “click” when delivered (clear start/finish).
- Alternate technique option (for high-anxiety users): closed-eye inner-canthus delivery (place drop at inner corner while closed, open to let it flow in). Label it clearly and advise users to confirm with their clinician.

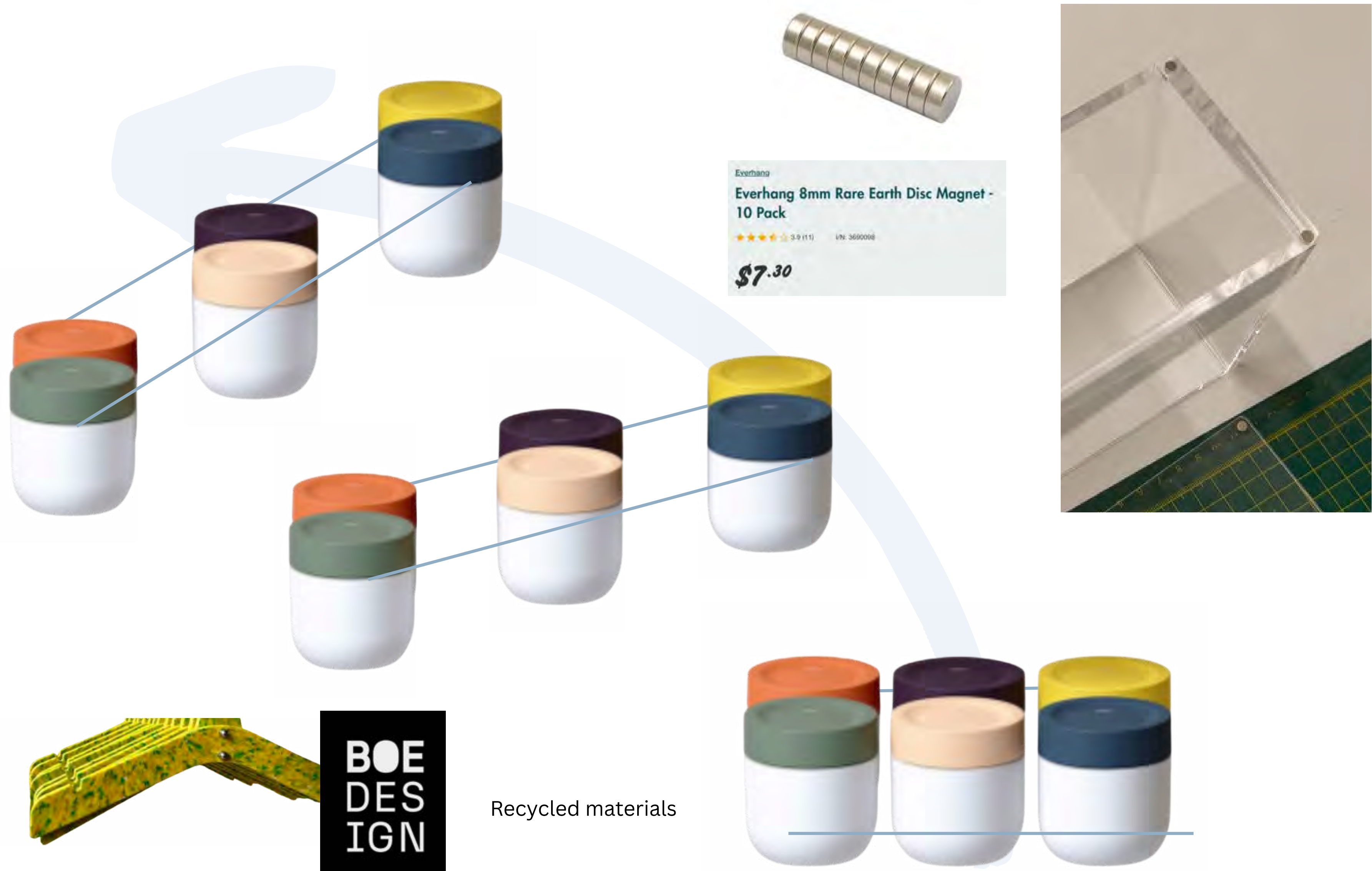
B. Travel Mechanism



user is able to detach administrator holder and use it as travel case



B. Case/ Kit Aesthetic



A. Adminster Body Material

TPU

- Strong casing material - suitable for gripability





Silicone

- suited for the gripping components



A. Twisting Mechanism to Refill Eye Drops

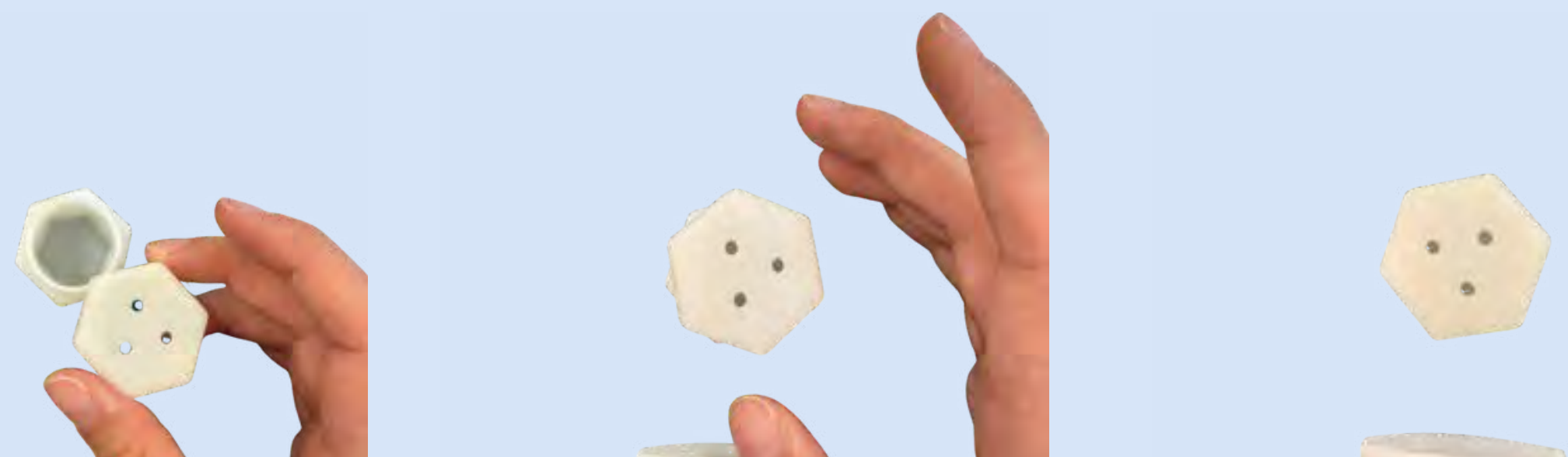
Dial mechanism



twisting mechanism



pivot mechanism



A. Body of Administrator Prototyping



A. Body of Administrator Prototyping

99 percentile male



.... percentile women



B. Education Screen

acrylic screen with etching with light



Understanding Side Effects of Dry Eye

Itchiness from eye drops, try using lubricating drops with warm compressions under your eye lid.

Send Data to Optometrist

Review Progress during your next Optometrist Appointment

“Please administer another drop again”

Understanding Glaucoma

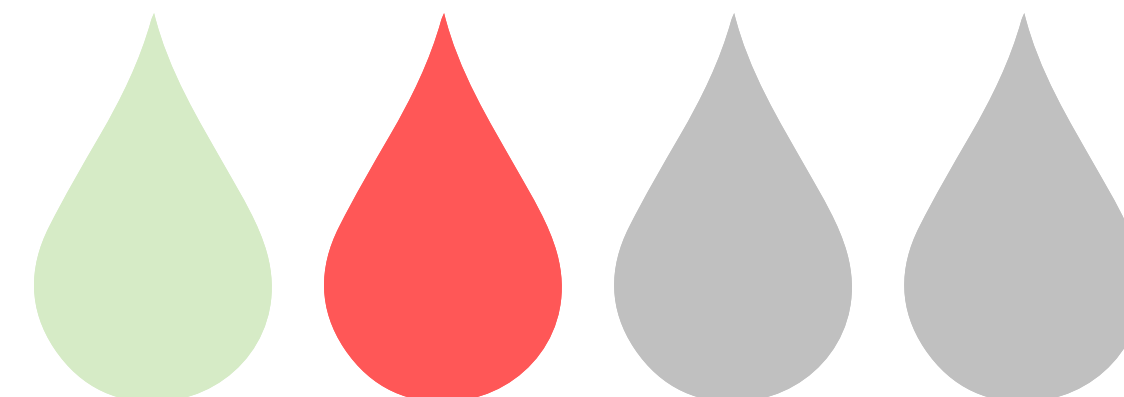
Continue using your drops to prevent vision loss.

For more info - visit Glaucoma Australia

Understanding Side Effects of Glaucoma

Stinging after eye drops is normal, keep going! For more info - visit Glaucoma Australia

Success 1 day streak!



REMINDER

it's time to administer eye drop!

B. Reminder Flasher Aesthetic



Reviewing Research

Physical

the functional hand

arthritis

- osteoarthritis

Parkinsons disease

1. motor symptoms
2. slowness of movement
 - Rigidity
 - loss of balance

1.



2.



3.



4.



5.



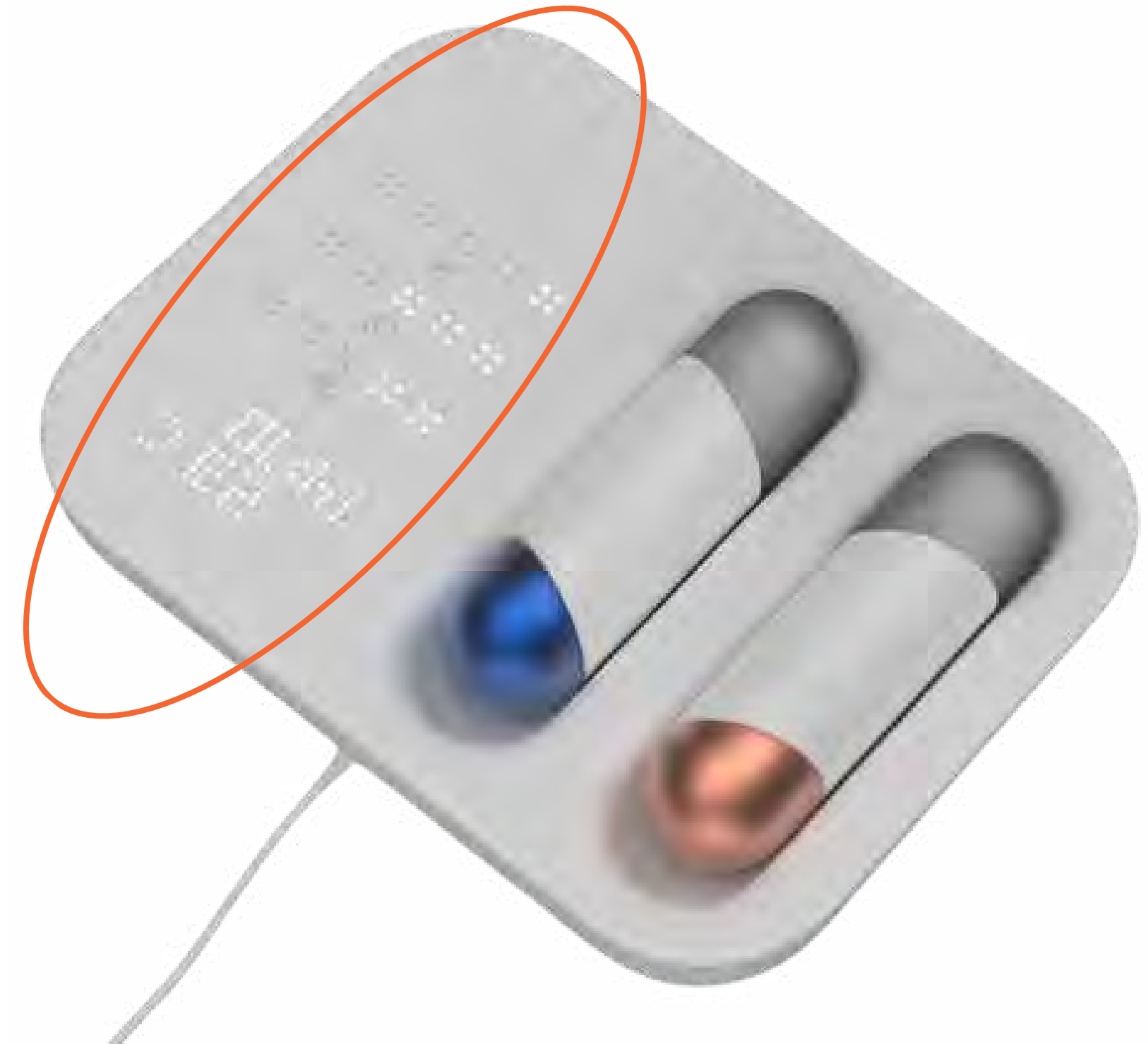
6.



7.



Acrylic Reminder Lights



maybe when they put the eye drop administator handle in the case
this can charge it and then notify the case lights that a eye drop
was last administered at this time today or that the patient is yet to
put in eye drops

Mid

Sem

Handle Shape Research



Handle Shape Research



Squeezing Mechanism Research



Small push-pull solenoid

★★★★★ 3 Reviews

SKU: ADA412 | Brand: Adafruit

Solenoids are basically electromagnets: they are made of a big coil of copper wire with an armature (a slug of metal) in the middle. When the coil is energized...

\$18.55 AUD, inc GST

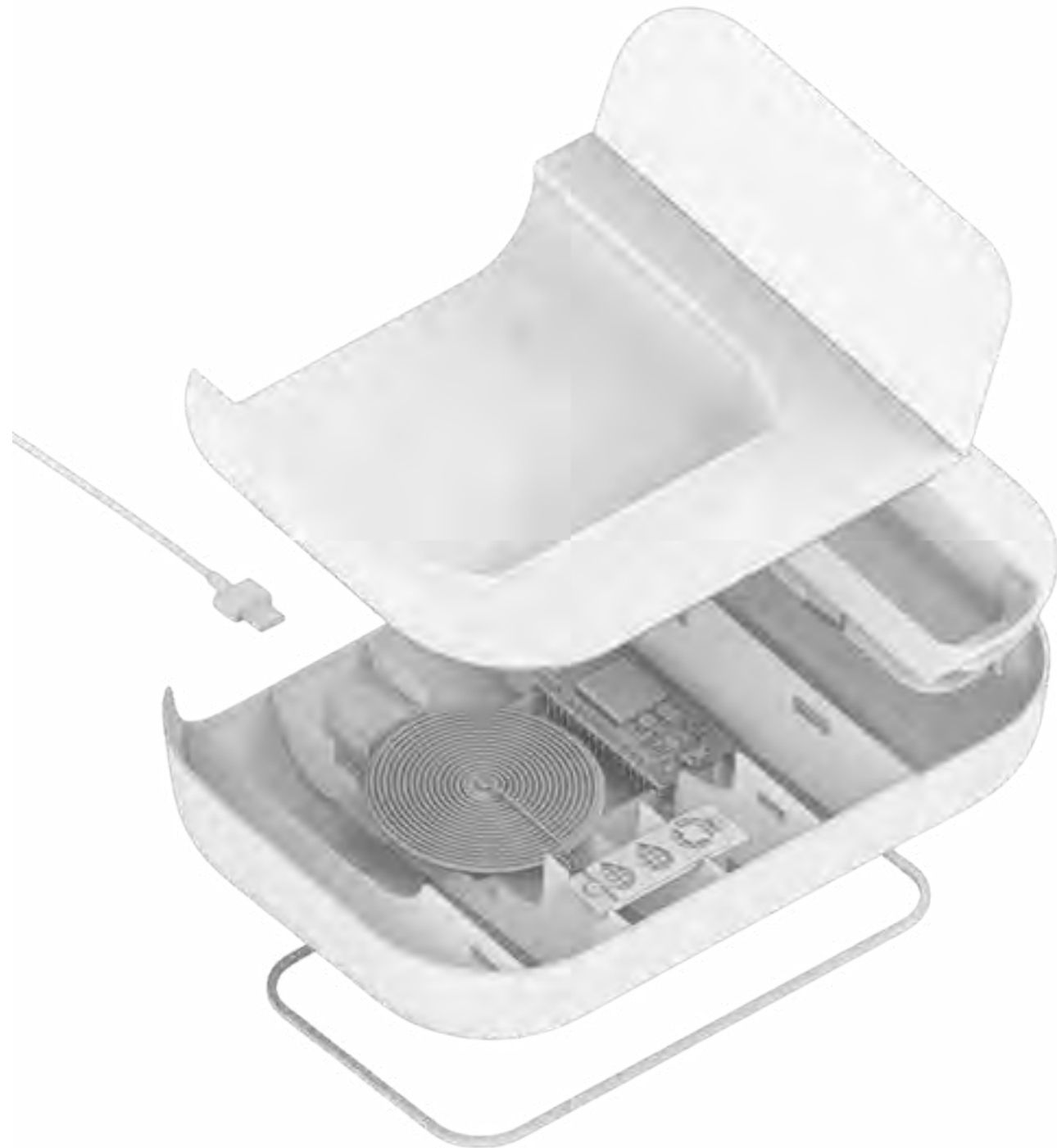
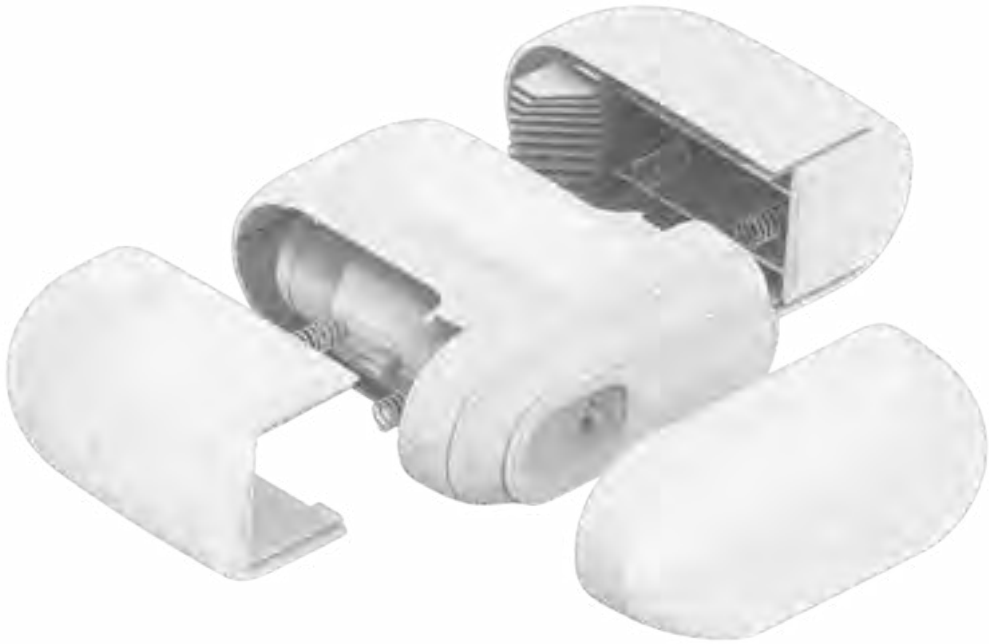
\$16.86 AUD, exc GST

In stock, ships same business day if ordered before 2PM
Fastest delivery: Tomorrow*

Quantity Discounts:

10+ \$16.19 (exc GST)

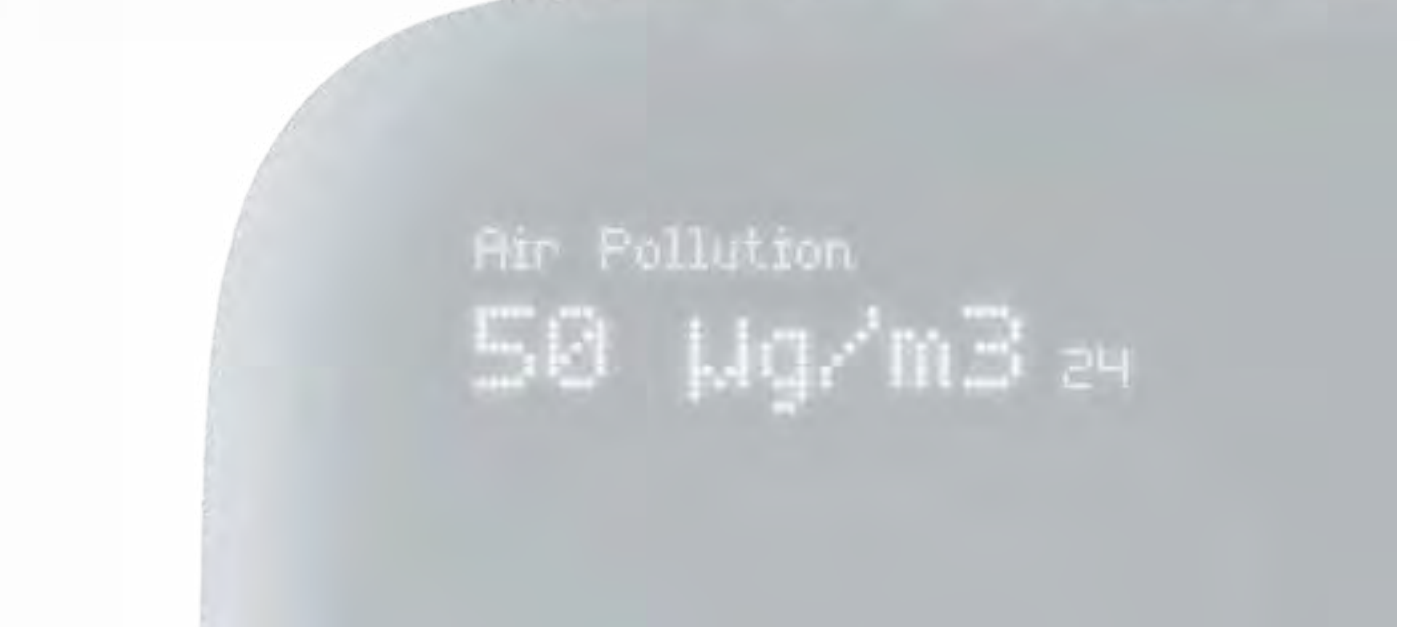
25+ \$15.68 (exc GST)



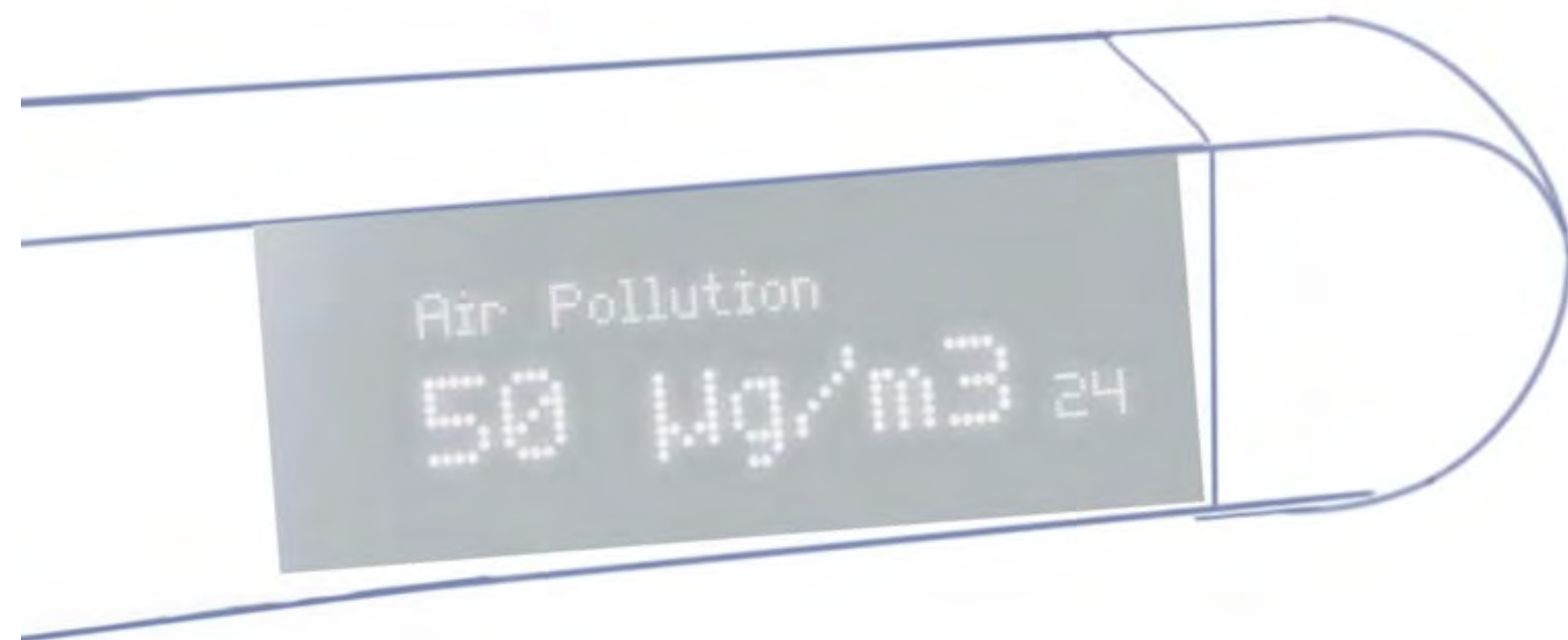
Handle Shape Research



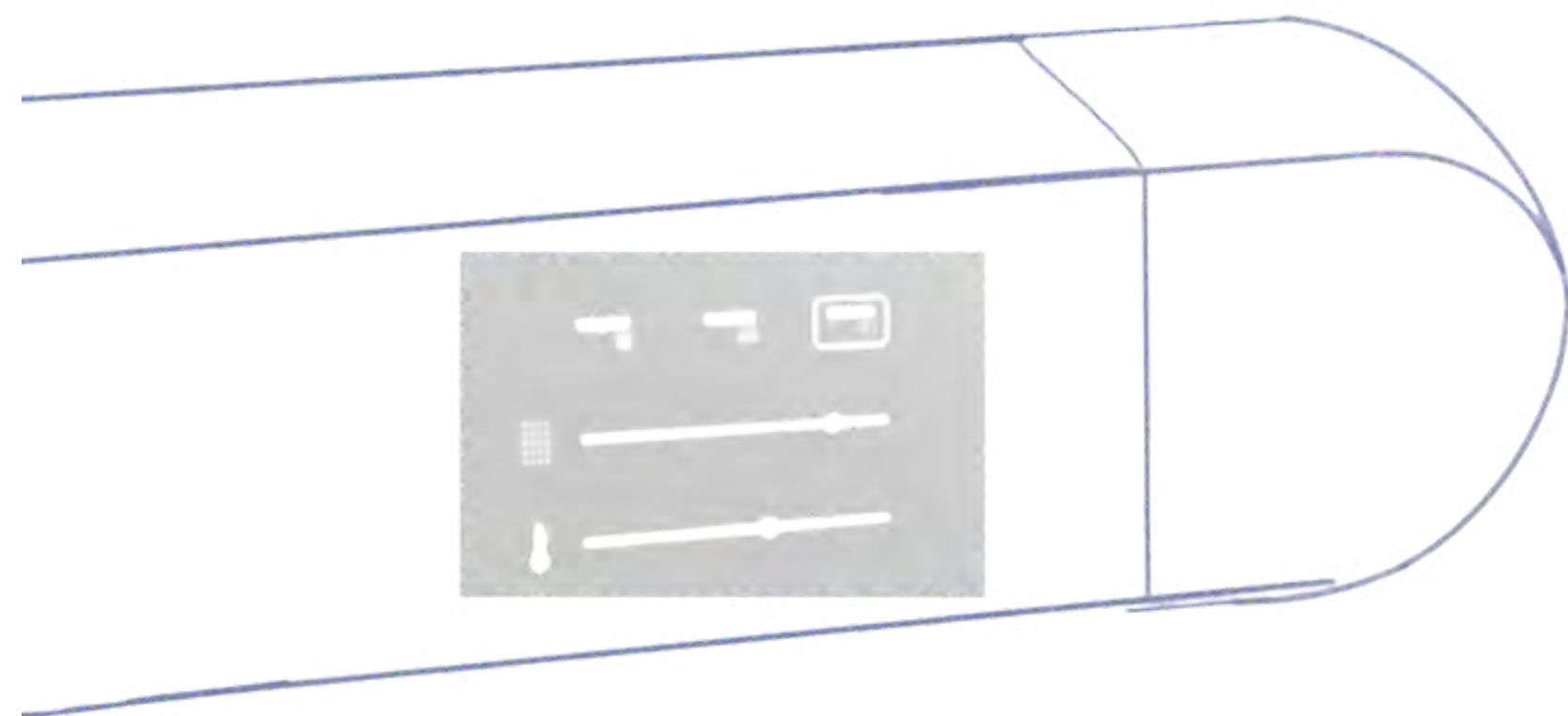
Light Reminder & Information Aesthetic



Handle Shape Research



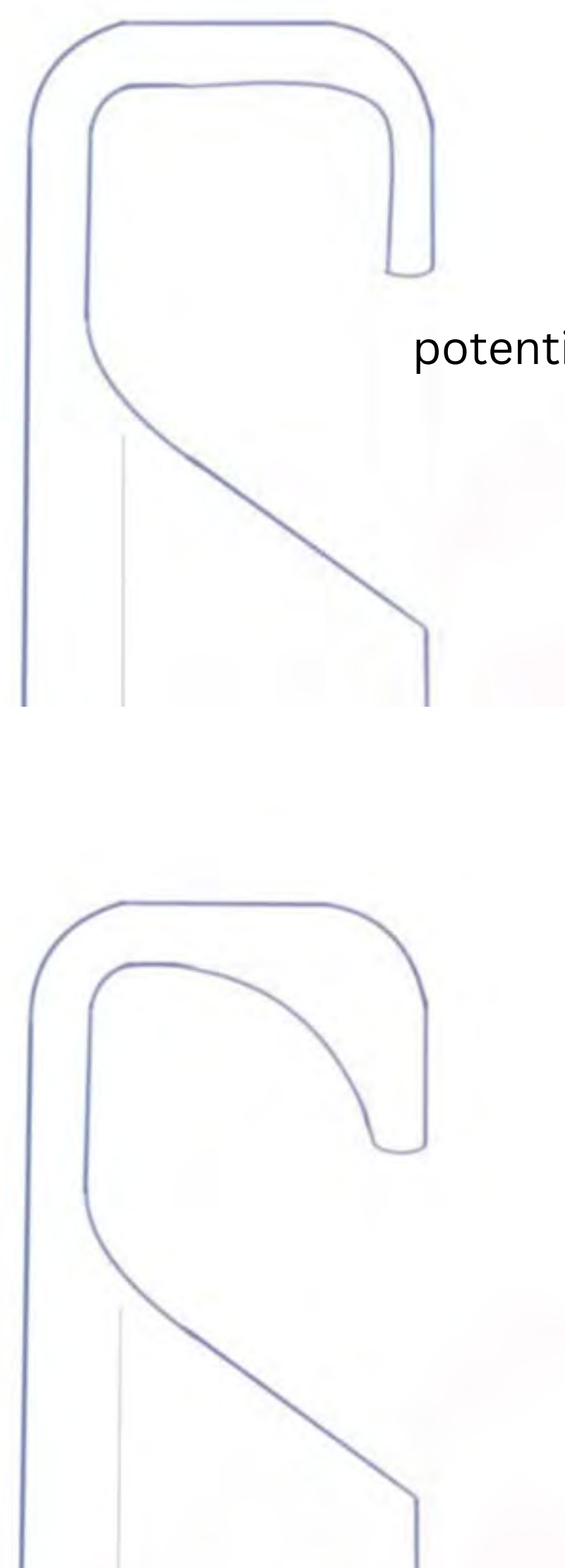
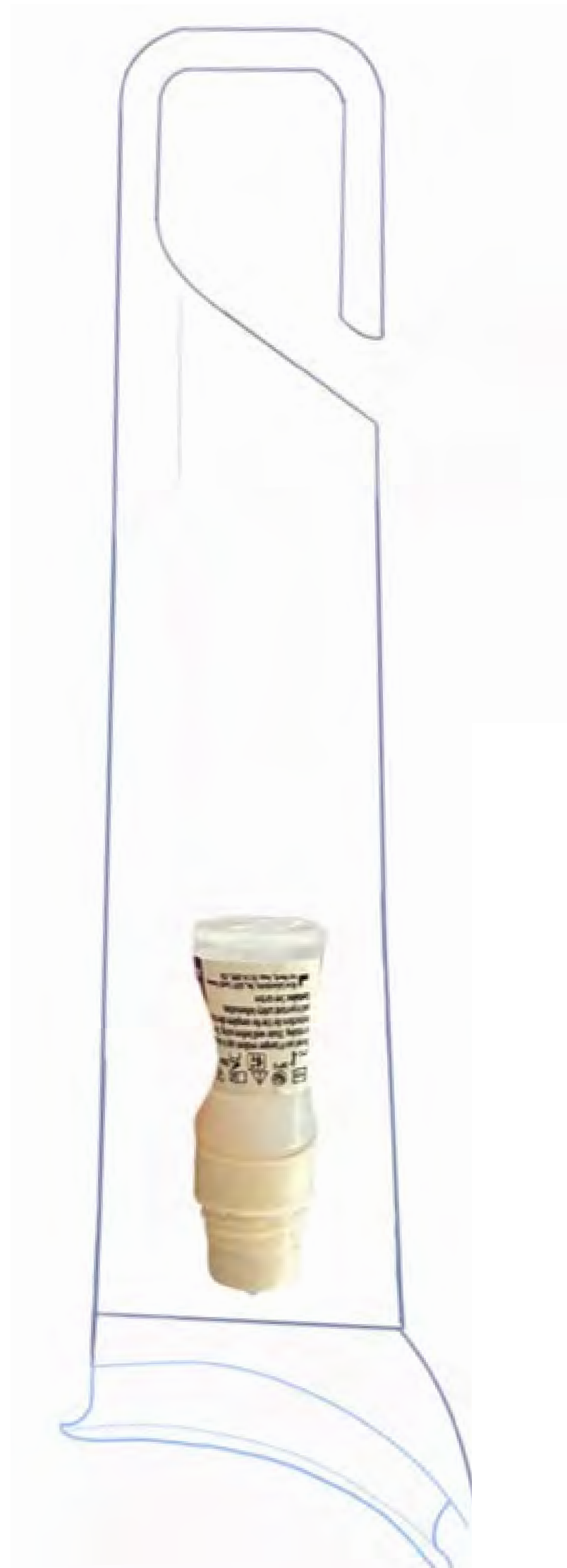
Aesthetic lights to suit medical context



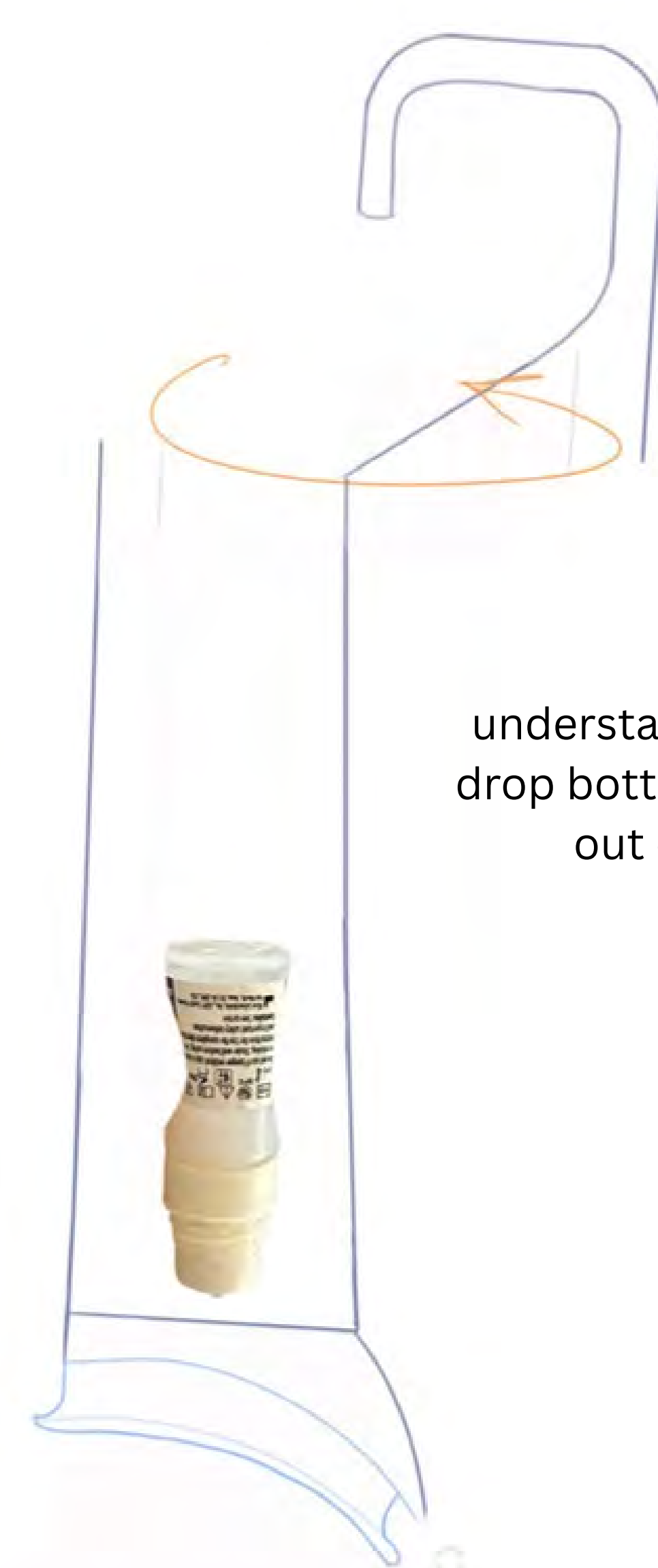
Light Reminder & Information Aesthetic



Eye Drop Bottle Positioning



potentially add a hook as
a hanger



understanding how eye
drop bottle will go in and
out of device

Eye Drop Bottle Shape & Pressure



squeezing pressure to
get eye drop out is
difficult and need a lot of
torque



Handle Shape Research

Challenge: opening and twisting open every eye drop bottle



- 2.9cm = twist whole
- 3.8cm = body

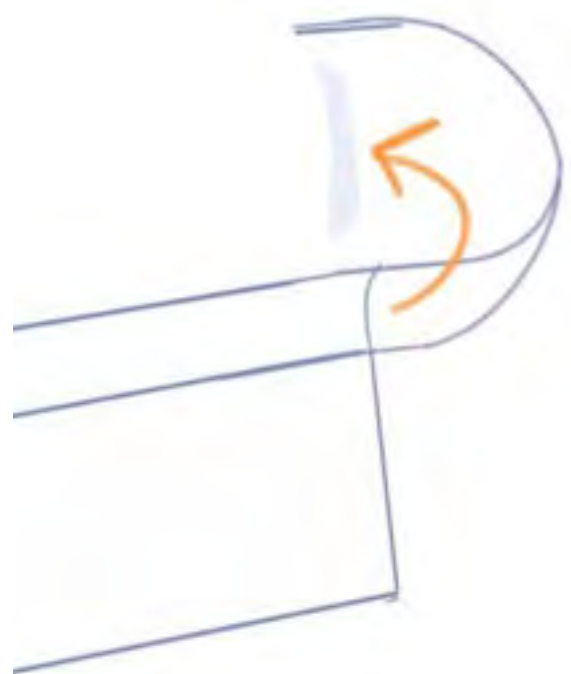


- 0.8cm = twist component
- 1.9cm = lid height



- 6.5cm = whole body height
- 2.2cm = diameter base
- 1.5cm = diameter top

Magnetic attaching main body of administer to the eye drop opener



You can open the eye drop bottle cap from where u out in the eye drop bottle



It is a easy twist pressure to open the lid and the larger handle allows more grip for user

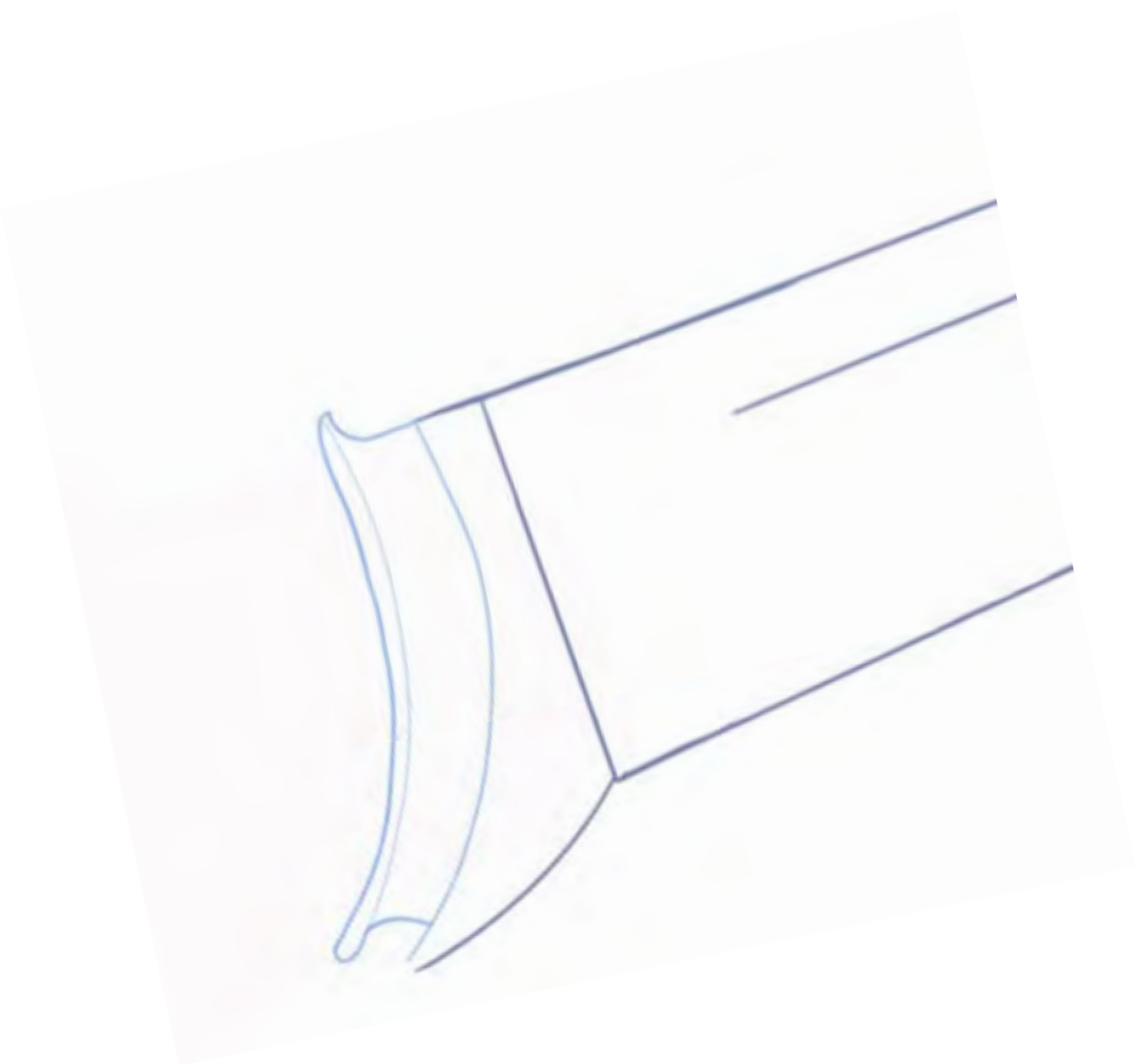


Administer Eye Form



angle of eye drop
administration

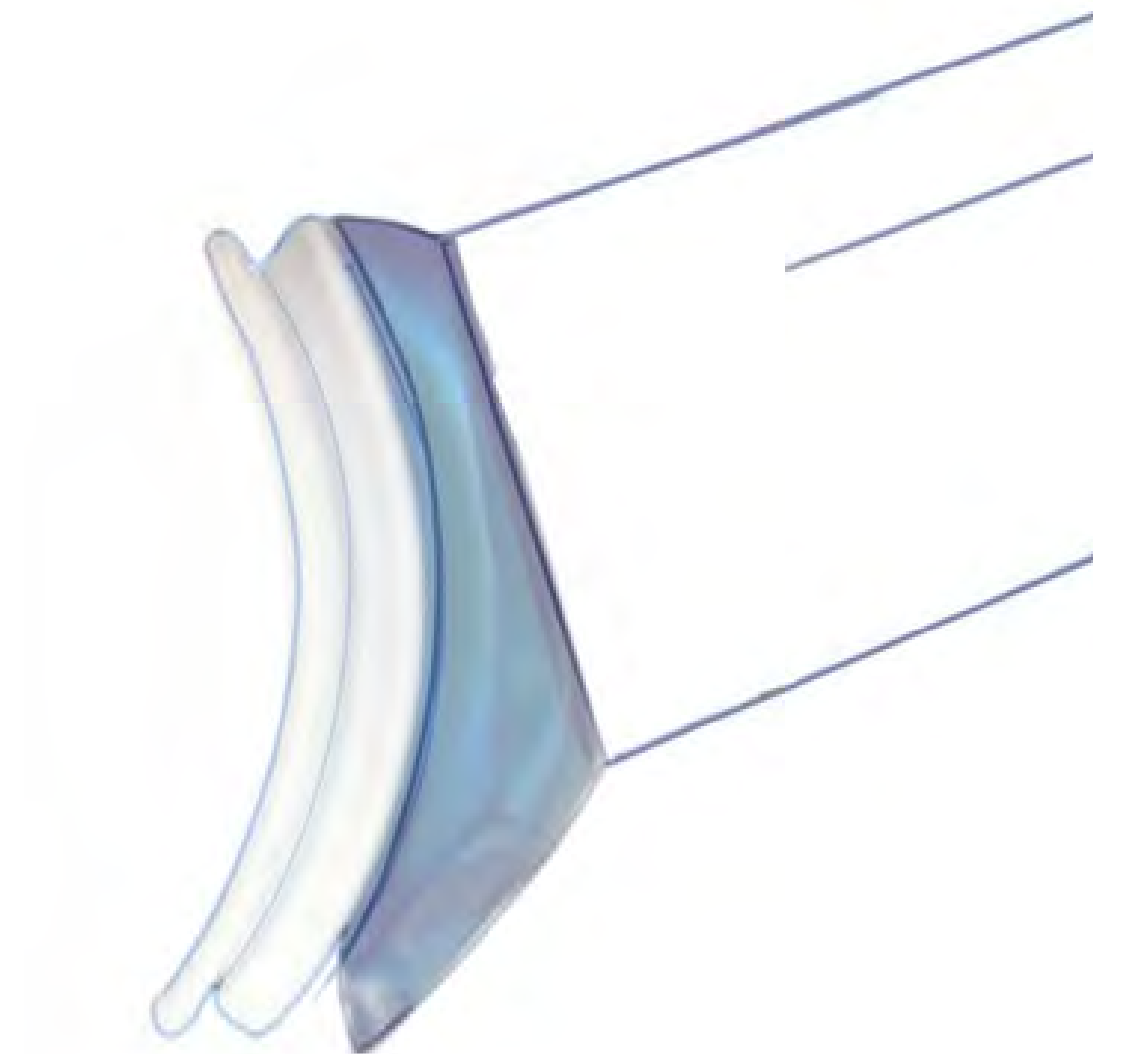
Eye Cup Sketching



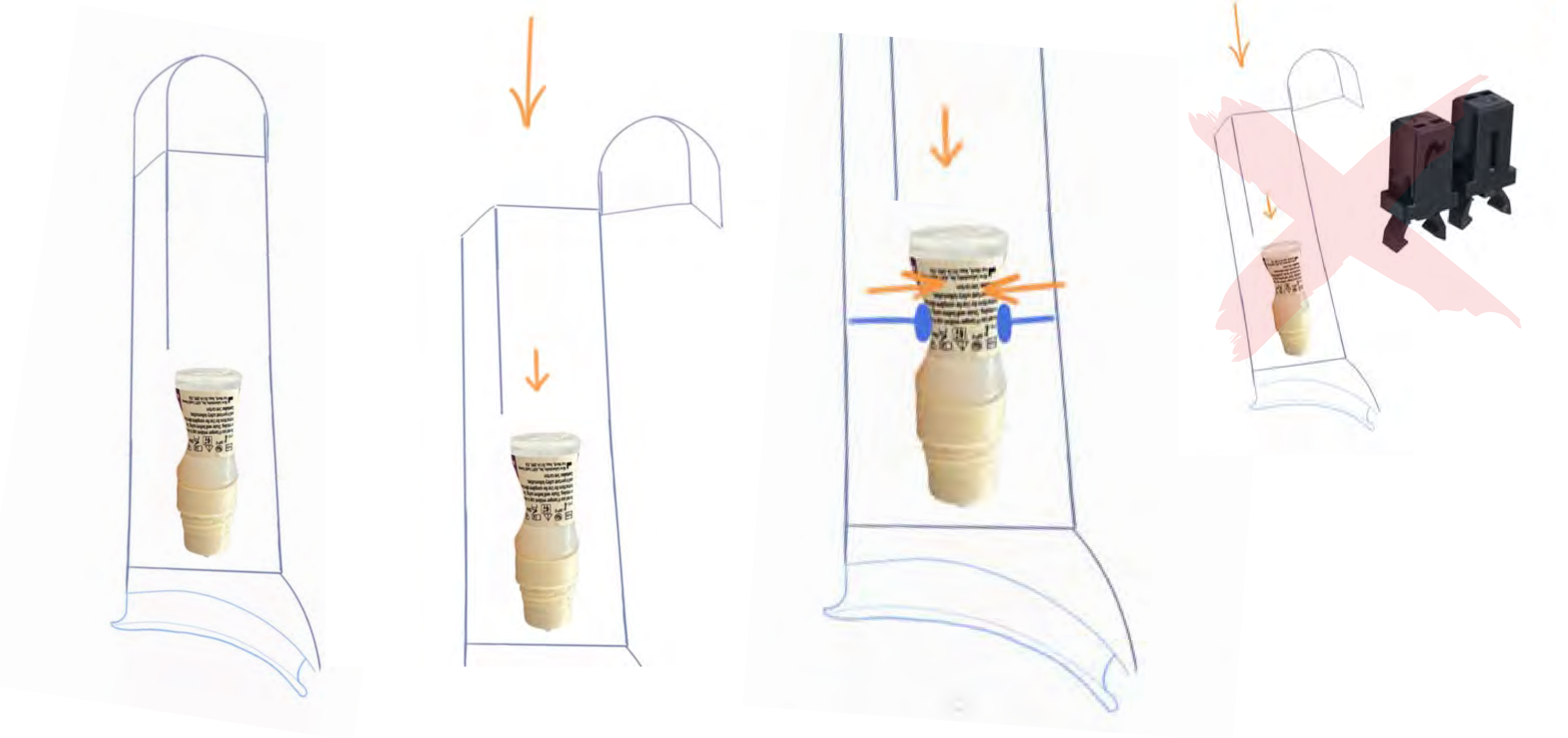
more comfortable shape
of eye cup and is more
simple and aesthetic



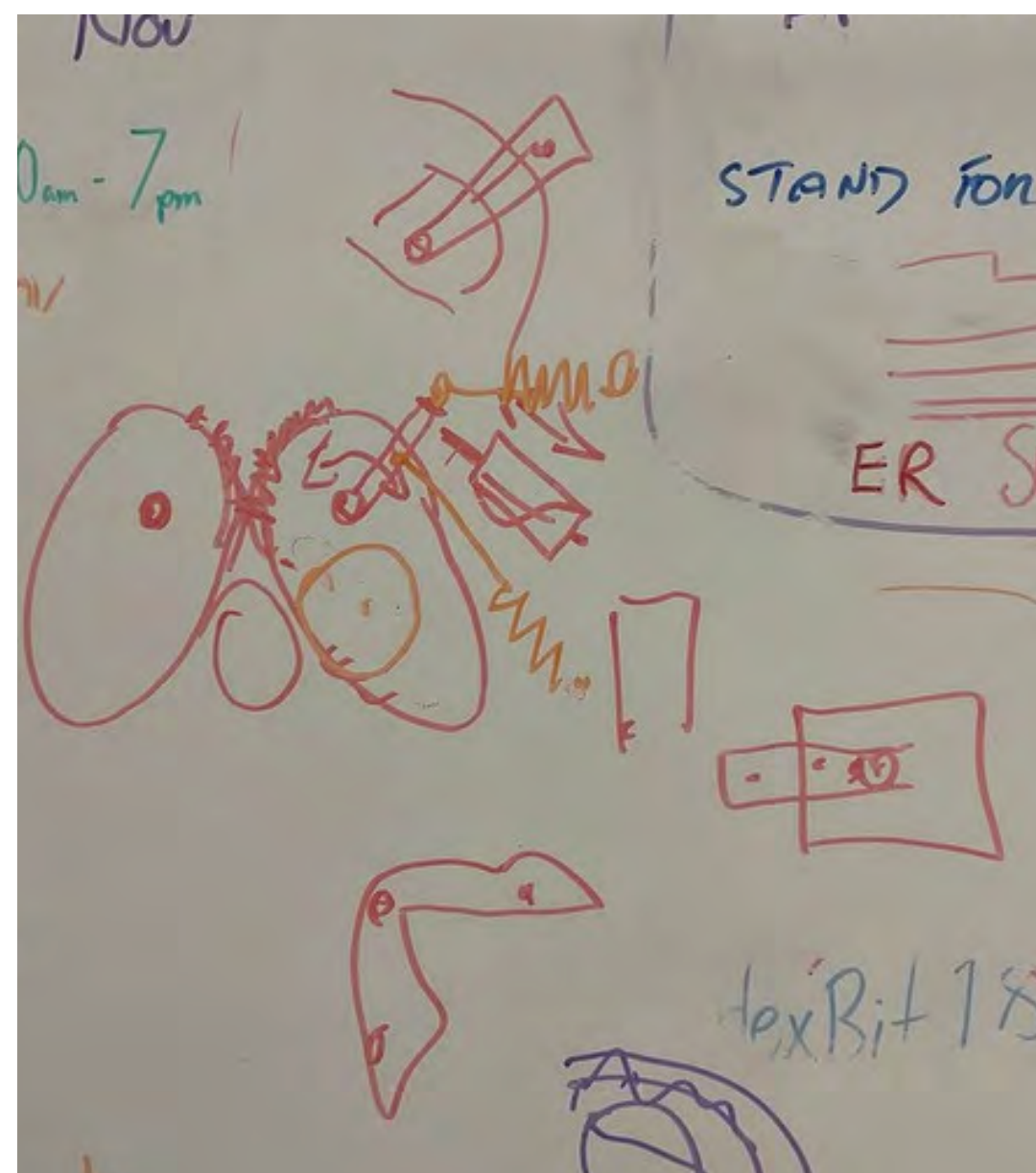
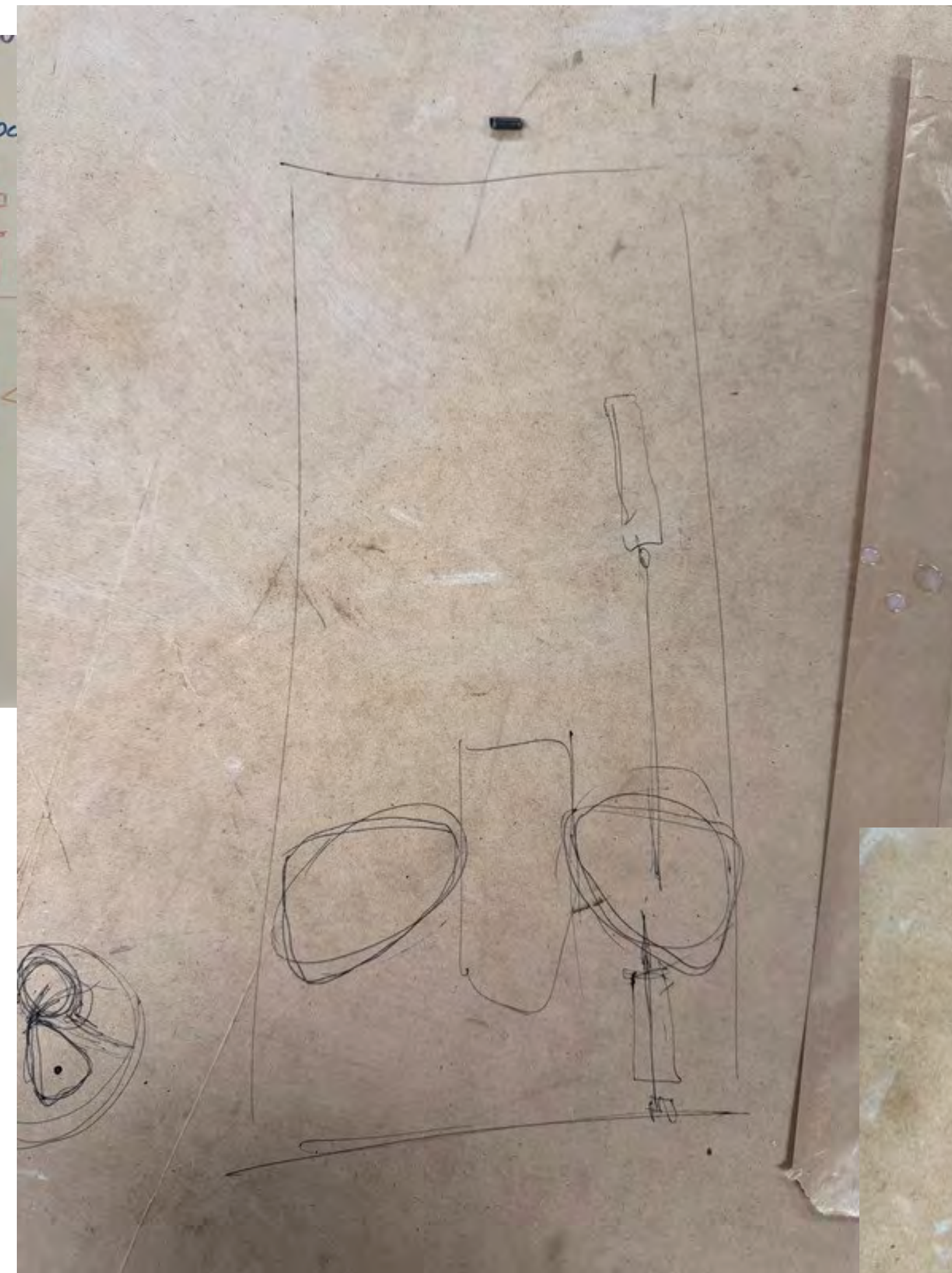
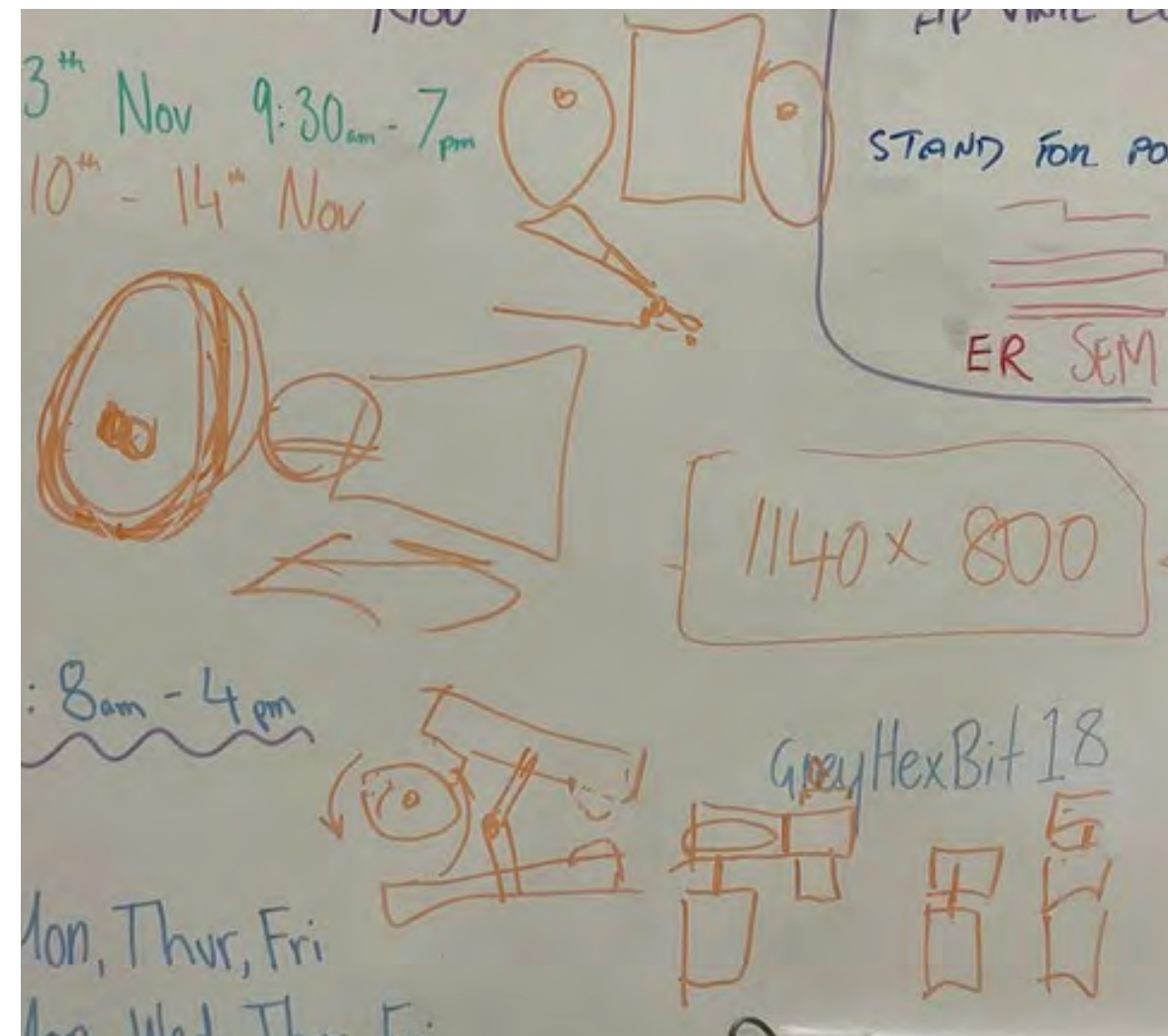
looks confusing



Inserting Eye Drop Bottle



Planning Squeezing Mechanism



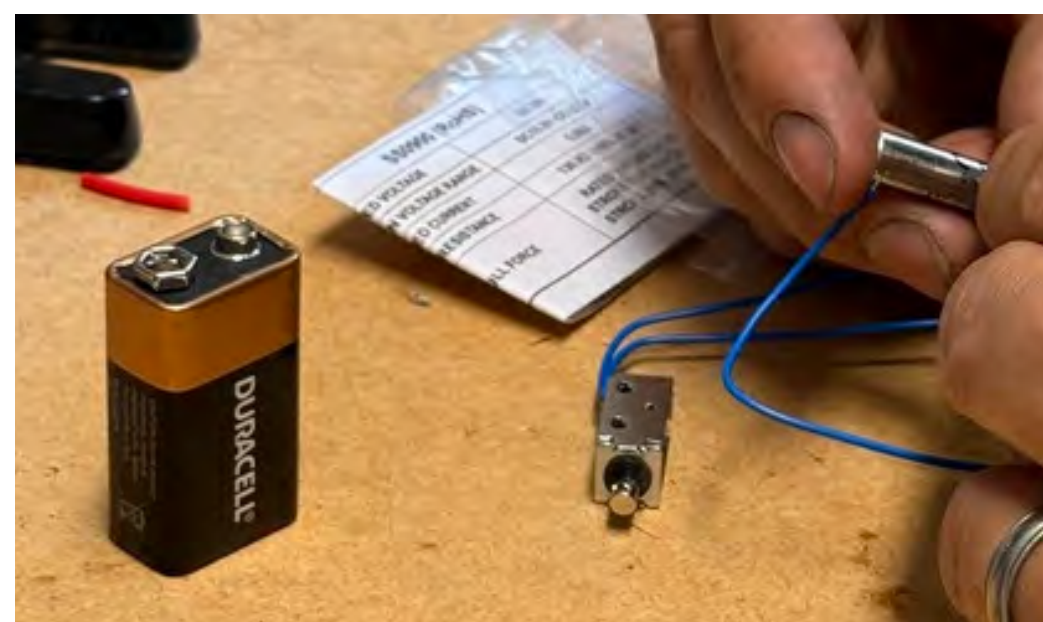
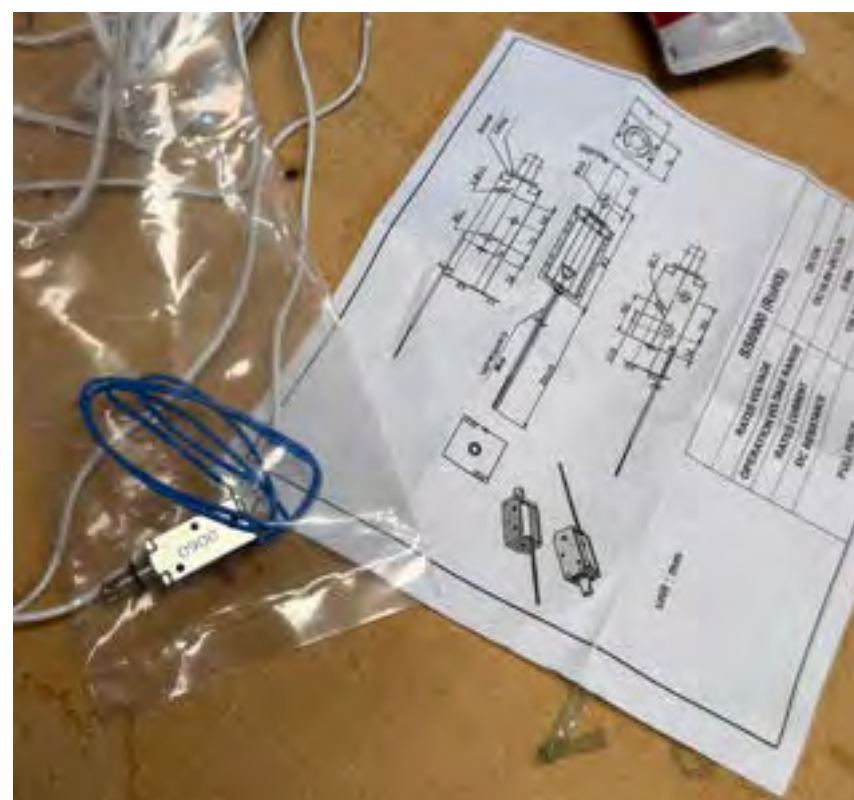
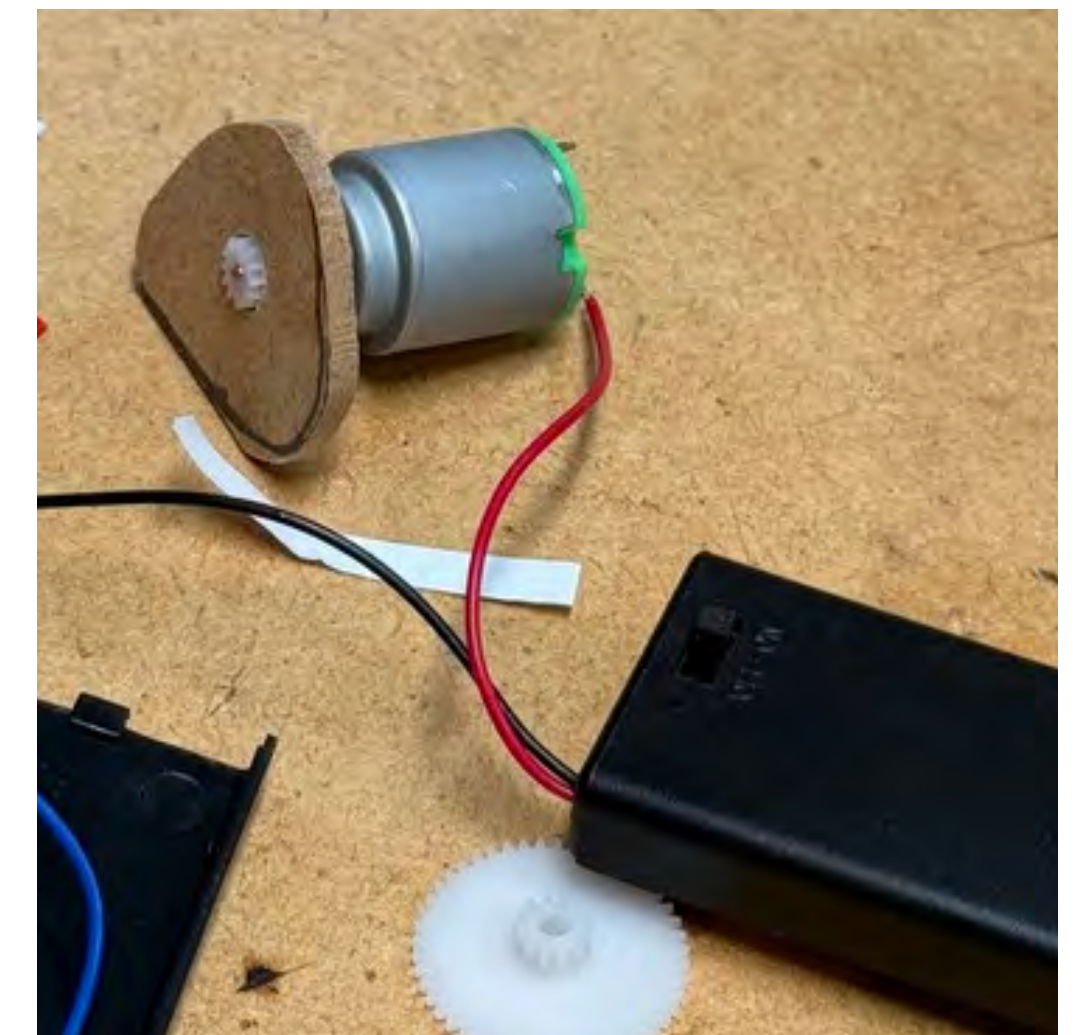
Iterating different cam mechanisms

Squeezing Mechanism

not enough torque for cam to spin on eye drop bottle



not enough torque for cam to spin on eye drop bottle



push mechanism does not work - not enough pressure

Squeezing Mechanism



magnets not strong enough

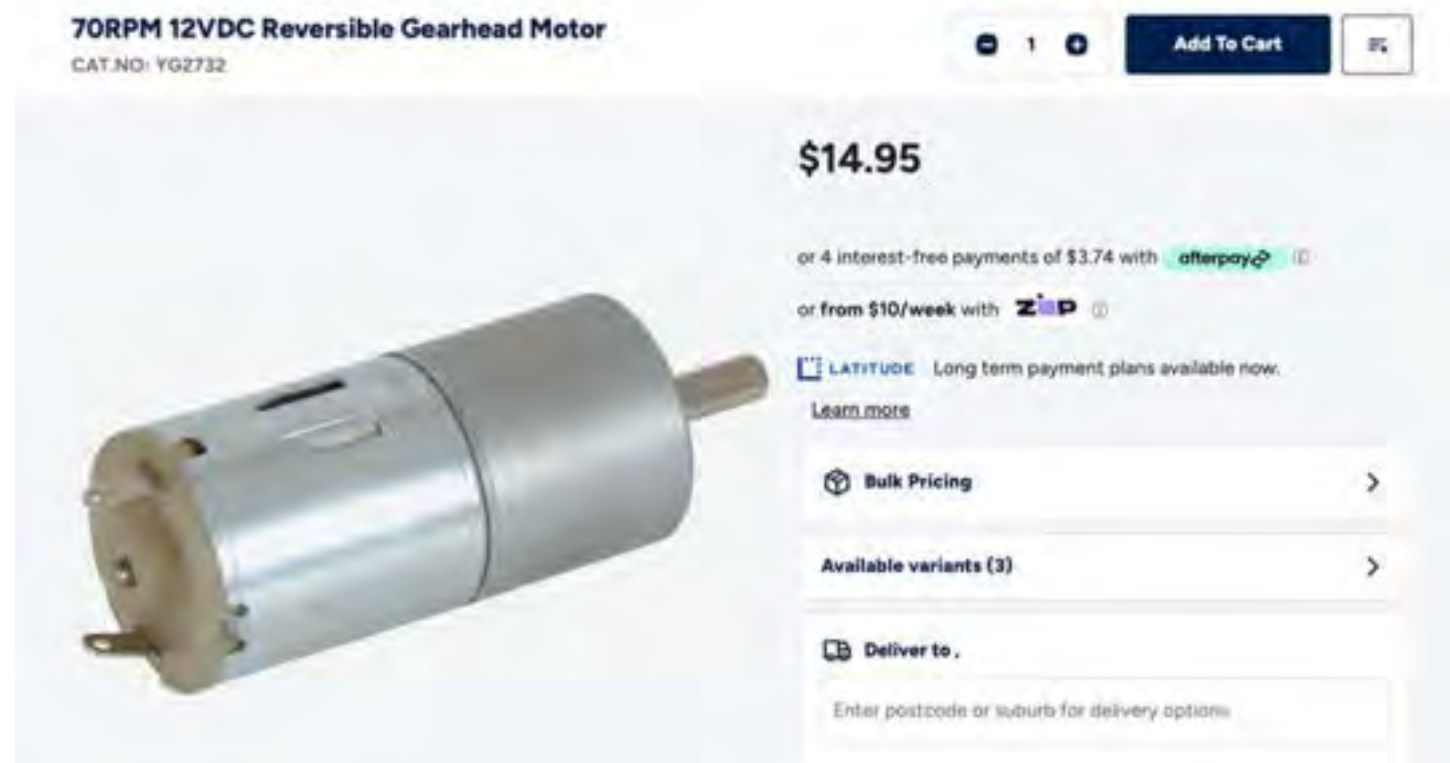


pegs unrealistic and not electronic



magnets not strong enough

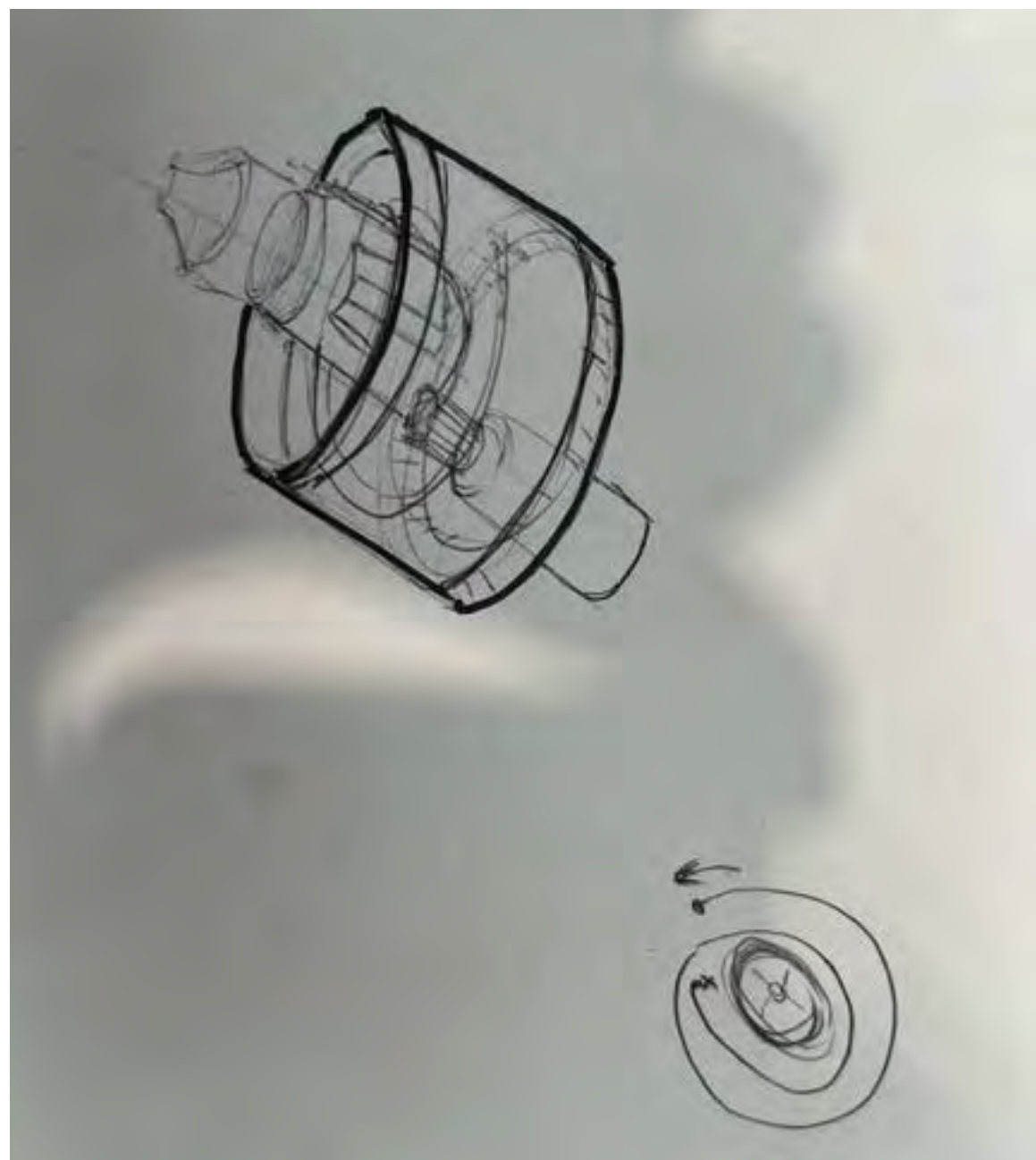
Squeezing Mechanism



Cable straps that turn and tightens around the bottle that is attached to a motor.

As per the photo i have provided, i want the darker lined part to be made out of thin plastic for example, Polycarbonate or TPU. I am hoping my motor has enough torque as well.

Essentially, i am thinking as an analogy a ribbon wrapping around a finger. The finger is the eye dropper and using a motor and some gears the ribbon can be tightened onto the finger. or even include some jaws around the bottle to squeeze it.



Different lights

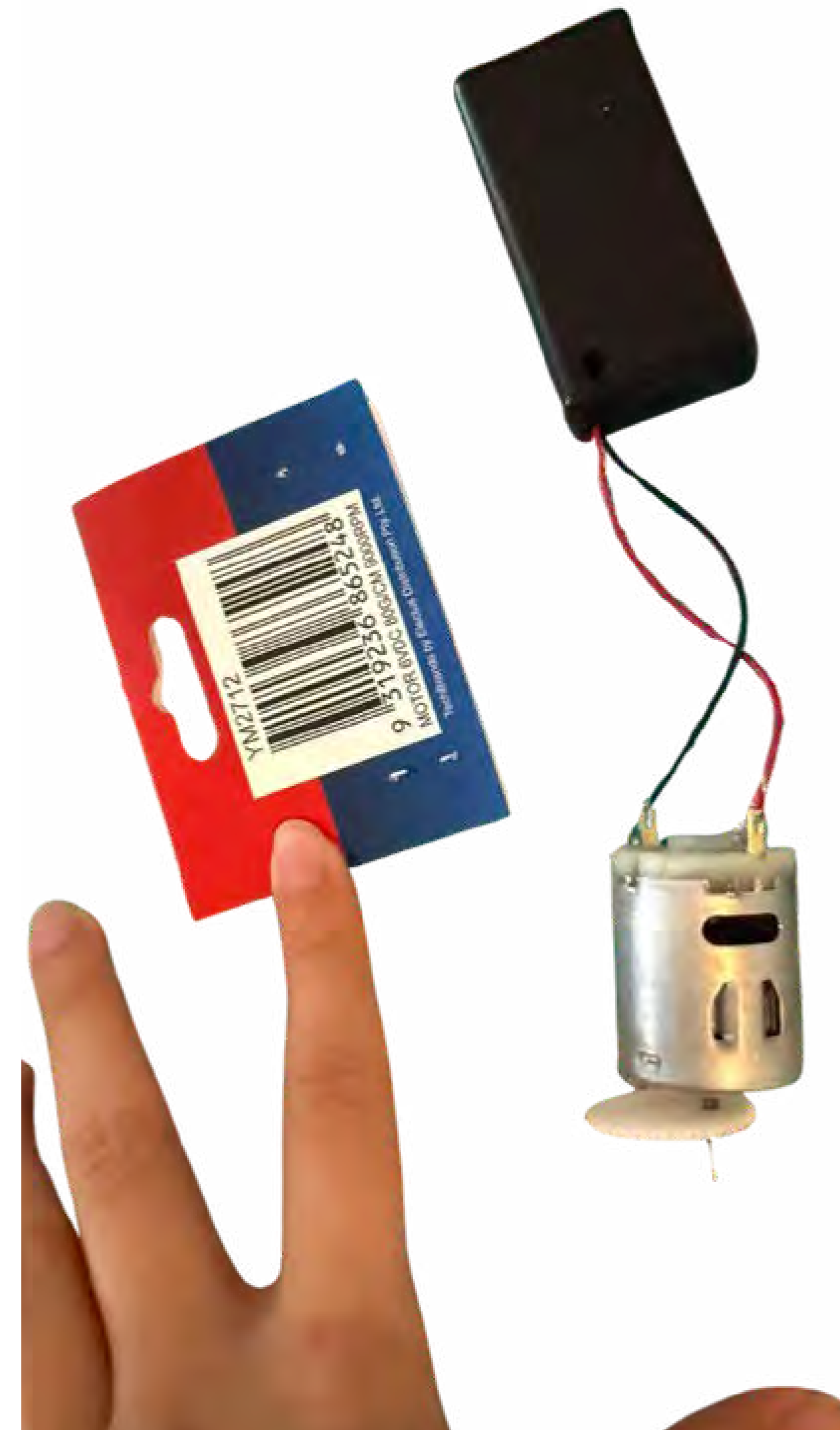


Squeezing Mechanism

Enough Torque



Not enough Torque



10 week

Overview



JIG

- Find out the shape and size of gear motor - and then make the outer casing for it
- when finding the size - also figure out how far away the eye drop bottle needs to be from the motor - find the measurement of the circles drilled -
- figure out if u want to make the casing all the way around the motor and screw in from the top

Casing for eye drop bottle

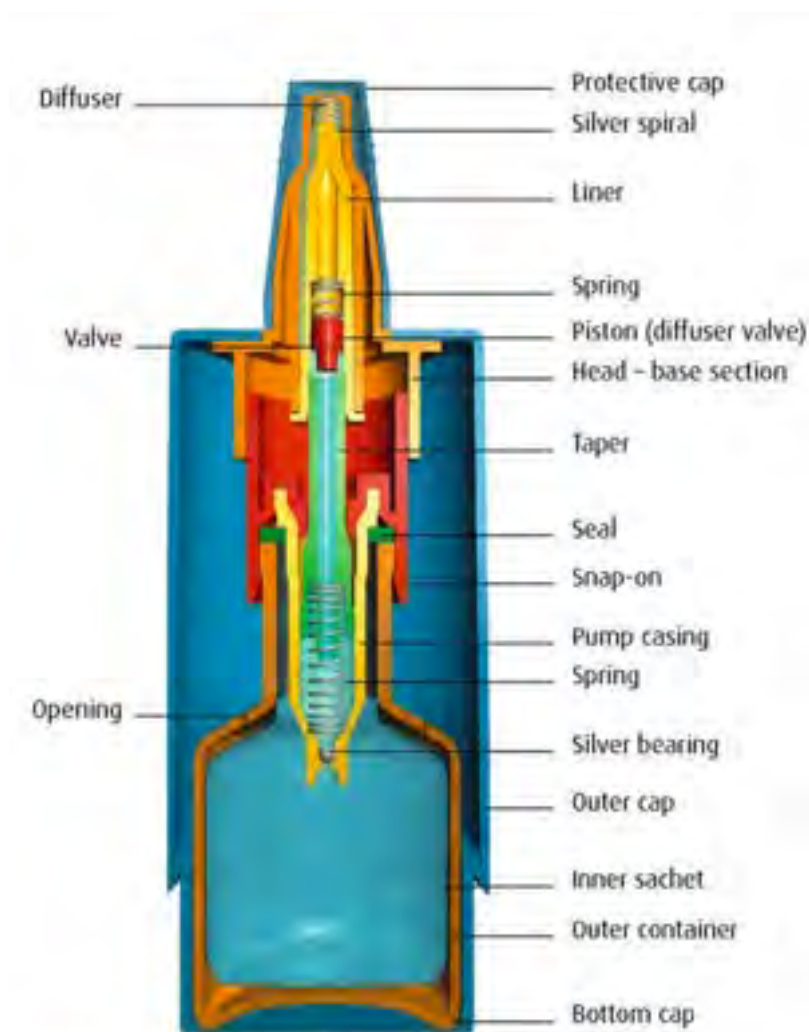
- need to have a slight indent on the sides of the eye drop bottle - so when the cam is pushed against it is pushed against it.
- this casing can be made out of TPU - plastic - soft - flimsy
- consider if you want to put a spring at the bottom of bottle so different shaped bottles can fit in
- consider if the casing for bottle has a funnel like shape for when the drop comes out of so it stays in place

Goggle - eye shape

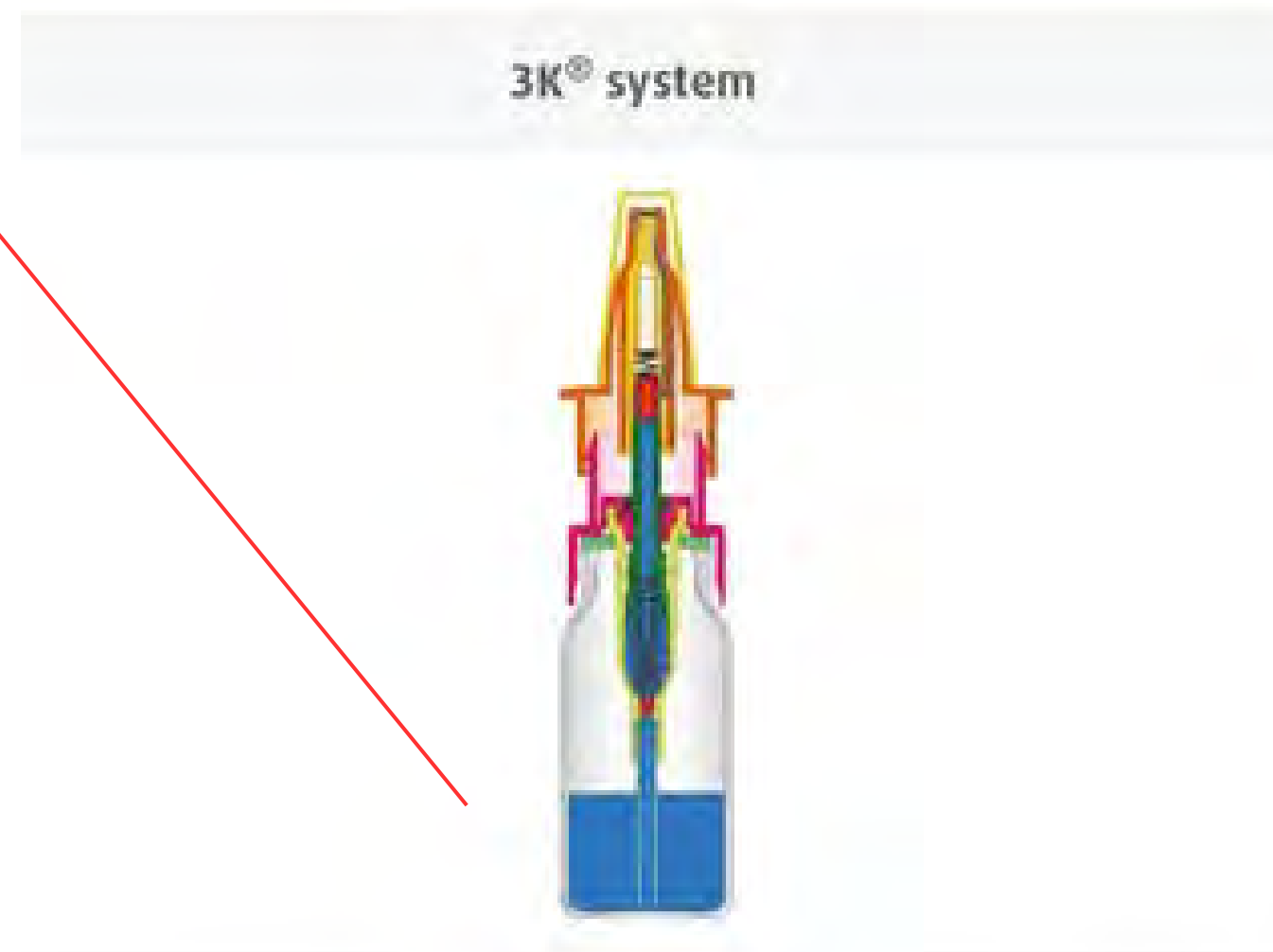
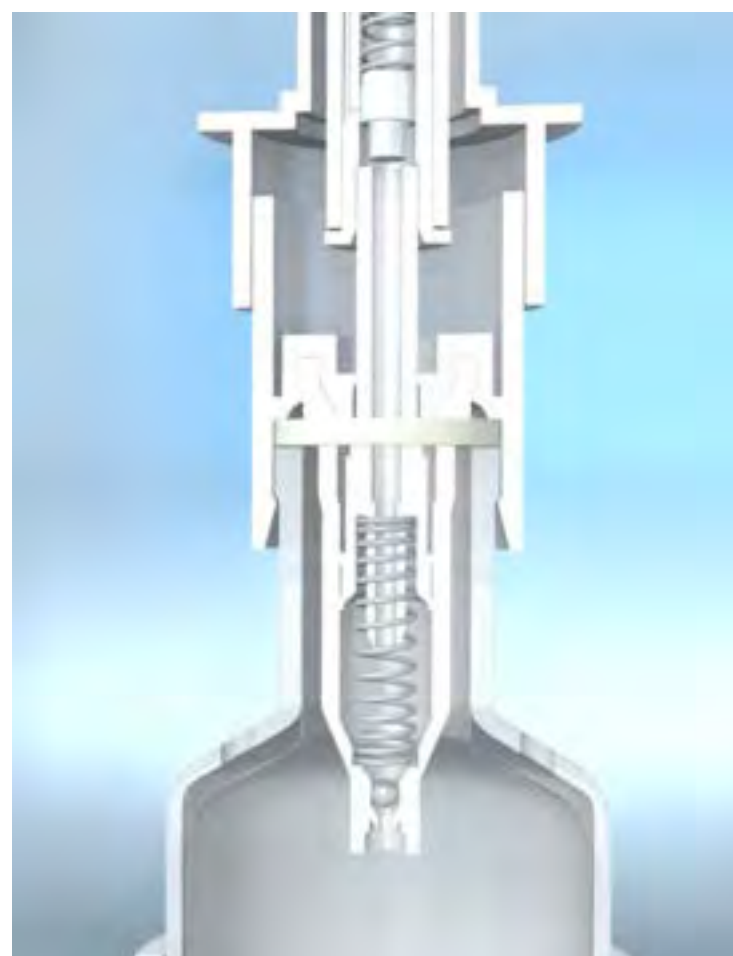
- Scan the goggle shape and get the dimensions
- need to edit the shape so that it is different enough from the original item in autodesk - fusion - the scan will also turn up a mesh material too so you will need to convert to a body afterwards
-

Hylo-Fresh

pump mechanism



Drop-by-drop dosage with the unique COMOD® system.



Hylo-Fresh



pump mechanism with leverage

- in-market device for users with low upper arm dexterity



easy attach and de-tactchable lid



In-Market Eye Drop Bottles



Electronic Exploration

sensitive button mechanisms to
iterate



CAPACITIVE TOUCH SENSOR MODULE FOR ARDUINO PROJECTS

Great replacement for standard push buttons switches

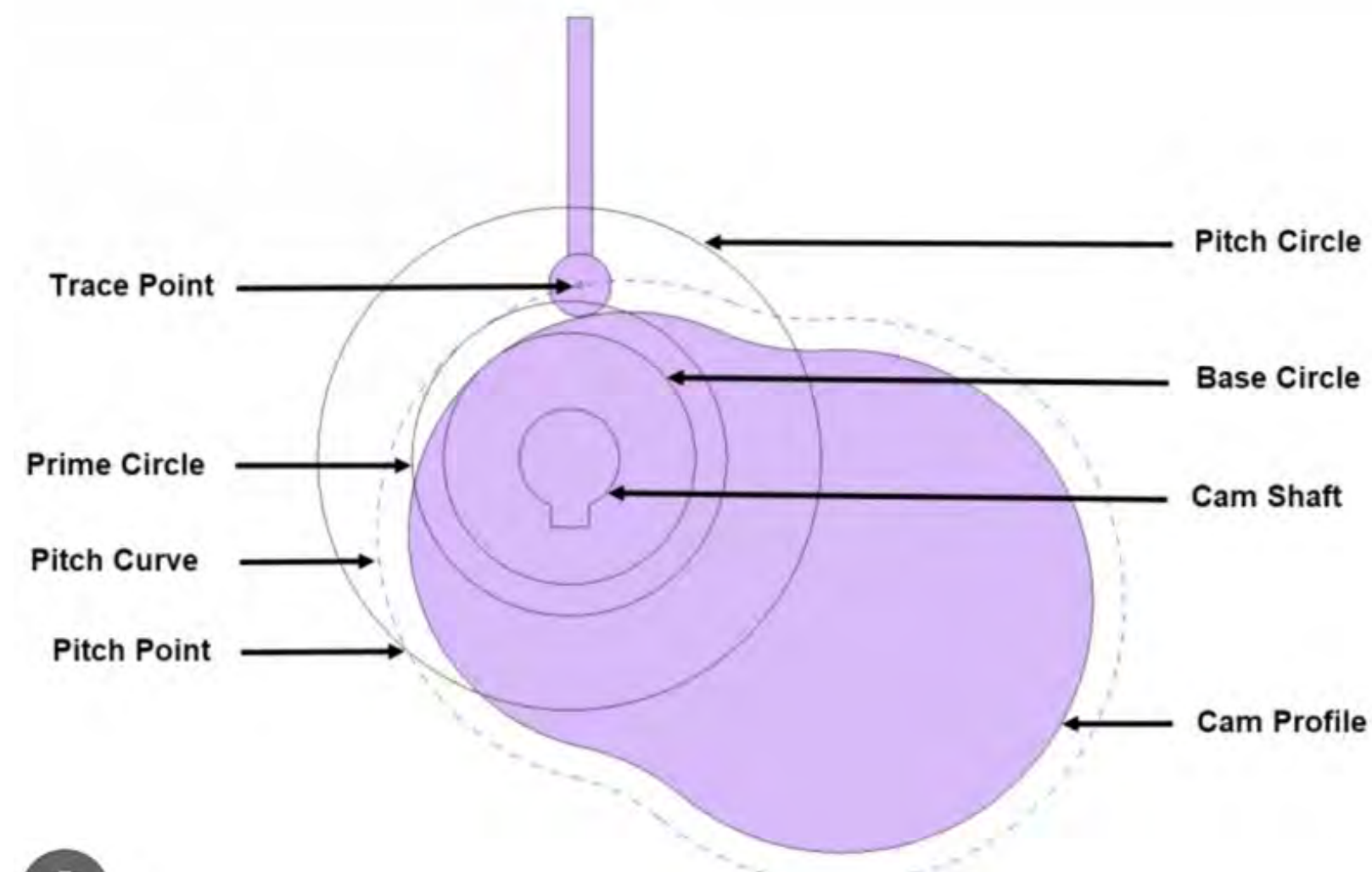
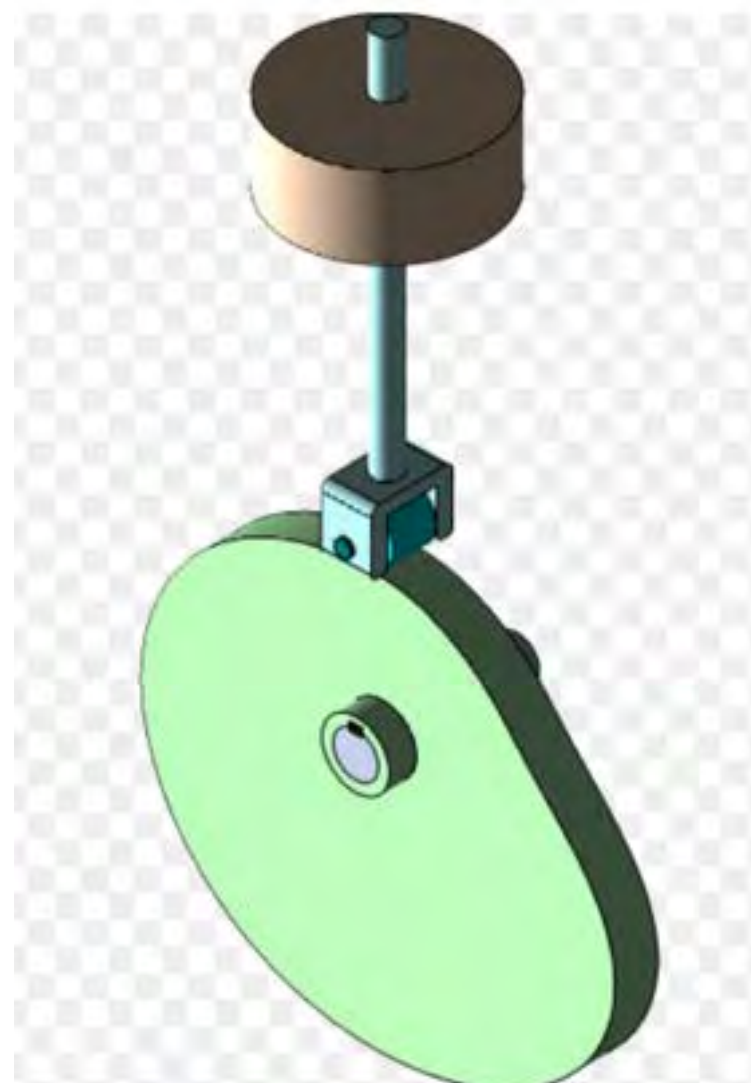
SKU: TA0155

Share: [Facebook](#) [Twitter](#) [LinkedIn](#) [Reddit](#) [StumbleUpon](#) ★★★★★ Rated 5/5 based on 1 reviews

\$3.25 RRP \$5.95 **In Stock**

Buy In Bulk & Save!

Buy 4 to 10:	Pay \$3.08 ea
Buy 11 to 20:	Pay \$2.93 ea
Buy 21 to 100:	Pay \$2.78 ea



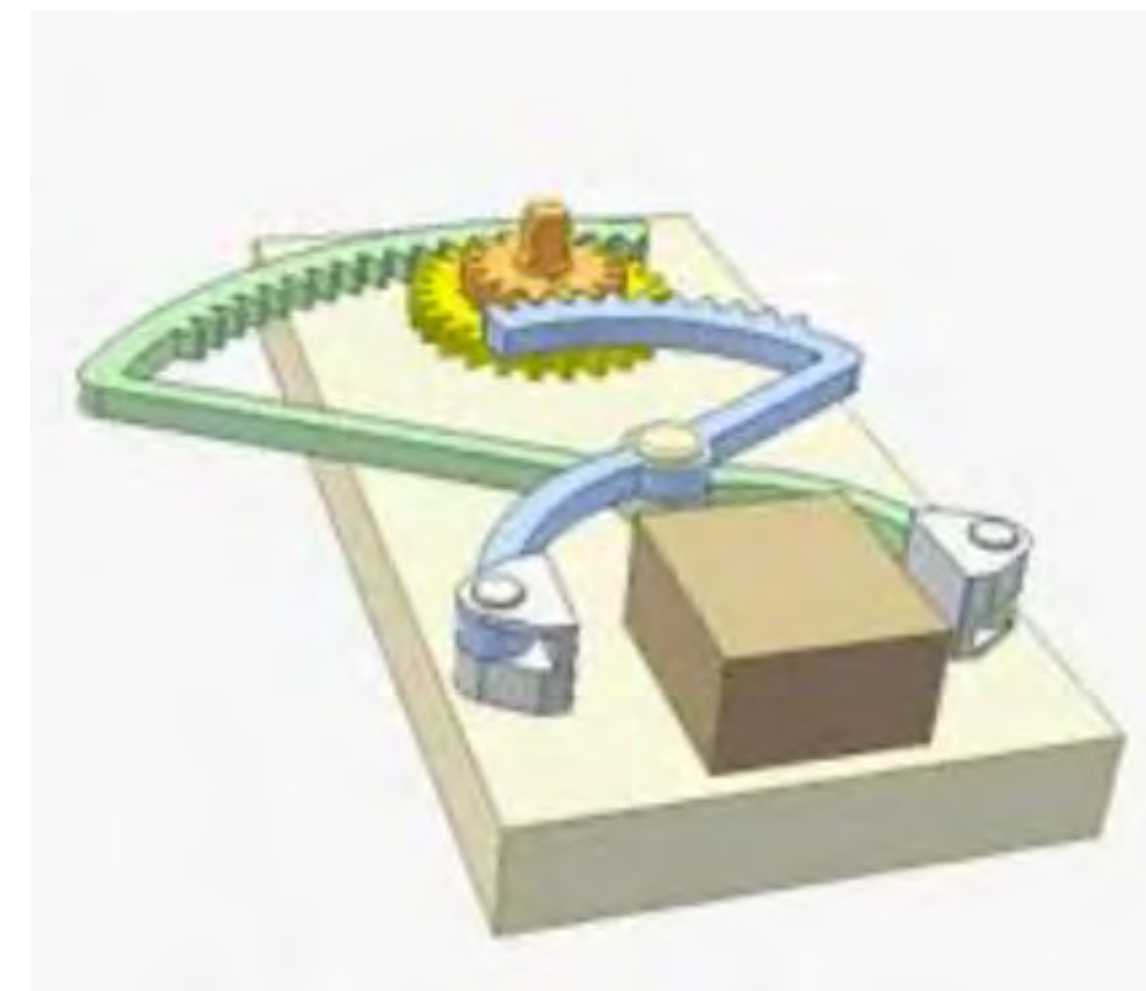
understanding cam shapes

Clamping Mechanism

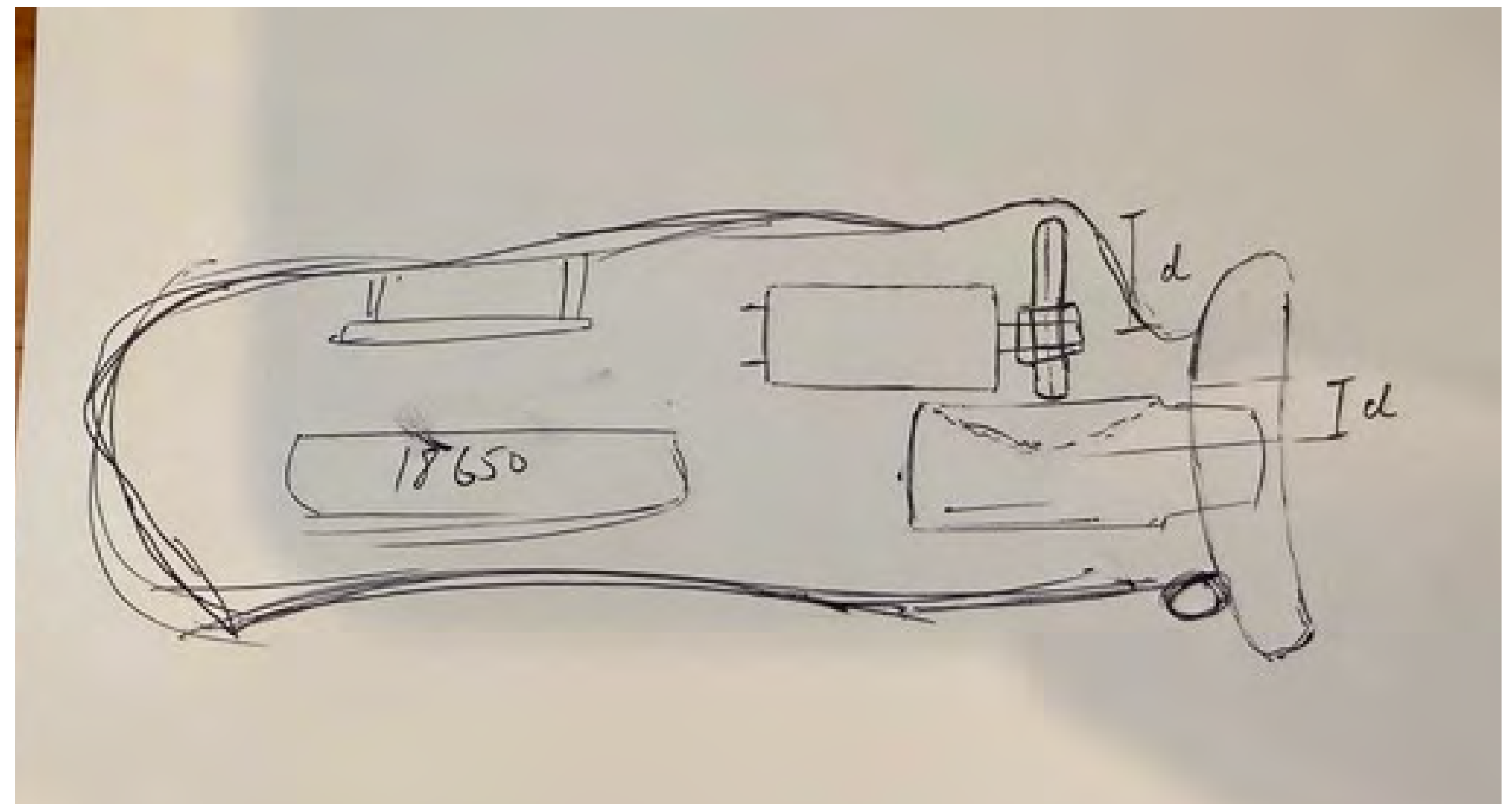
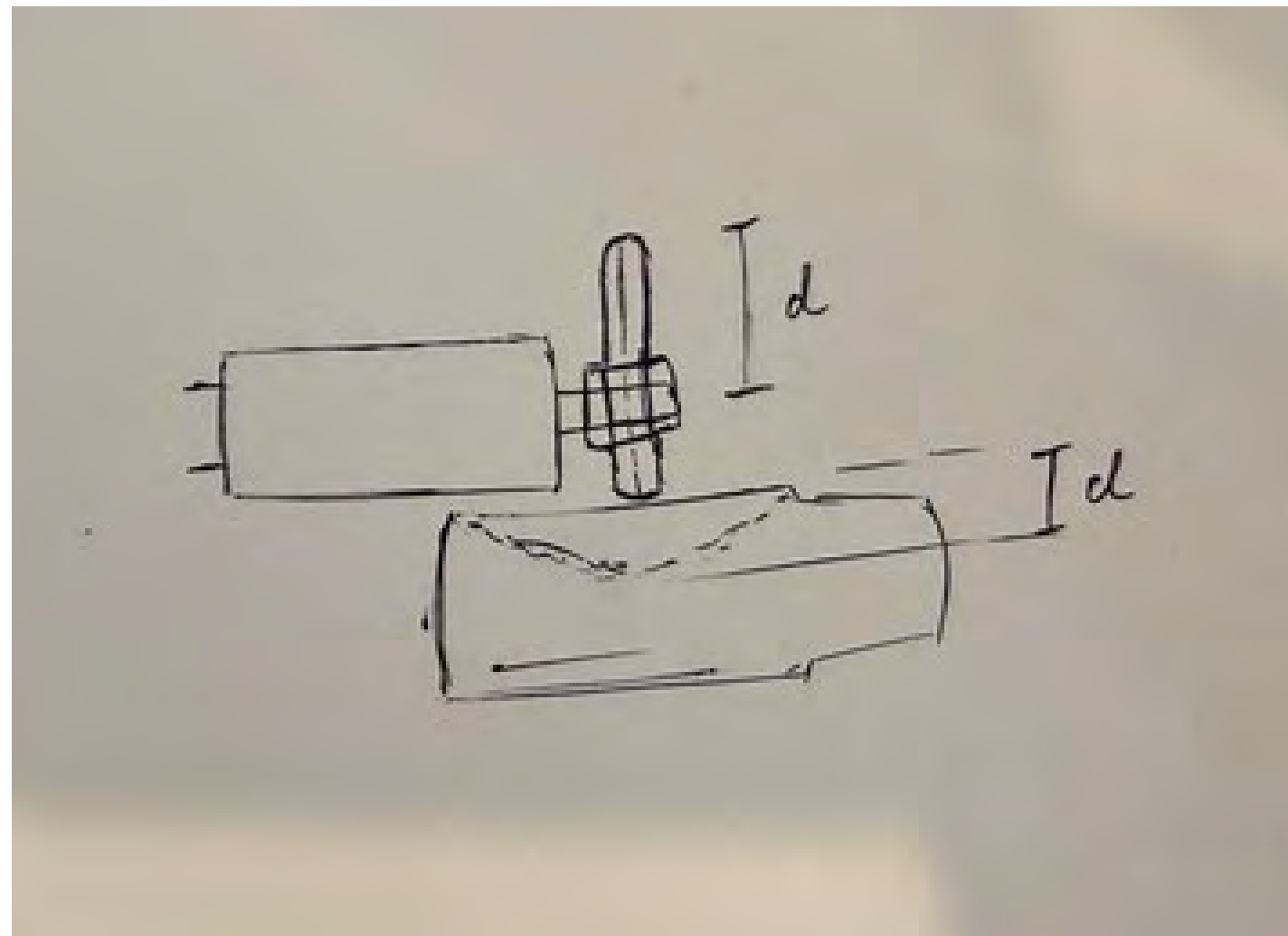
all are too big to incorporate and too expensive as 'off the shelf' internal mechanisms

Kitronik Klaw MK2 Robotic Gripper

RS Stock No.: [266-3752](#) | Mfr. Part No.: 25104 | Brand: [Kitronik](#)



Squeezing Mechanism



half of eye drop bottle = 1.1cm
centre of motor to edge = 1.1cm

Squeezing Mechanism



Electronic Twisting works!
• powered by gearhead motor



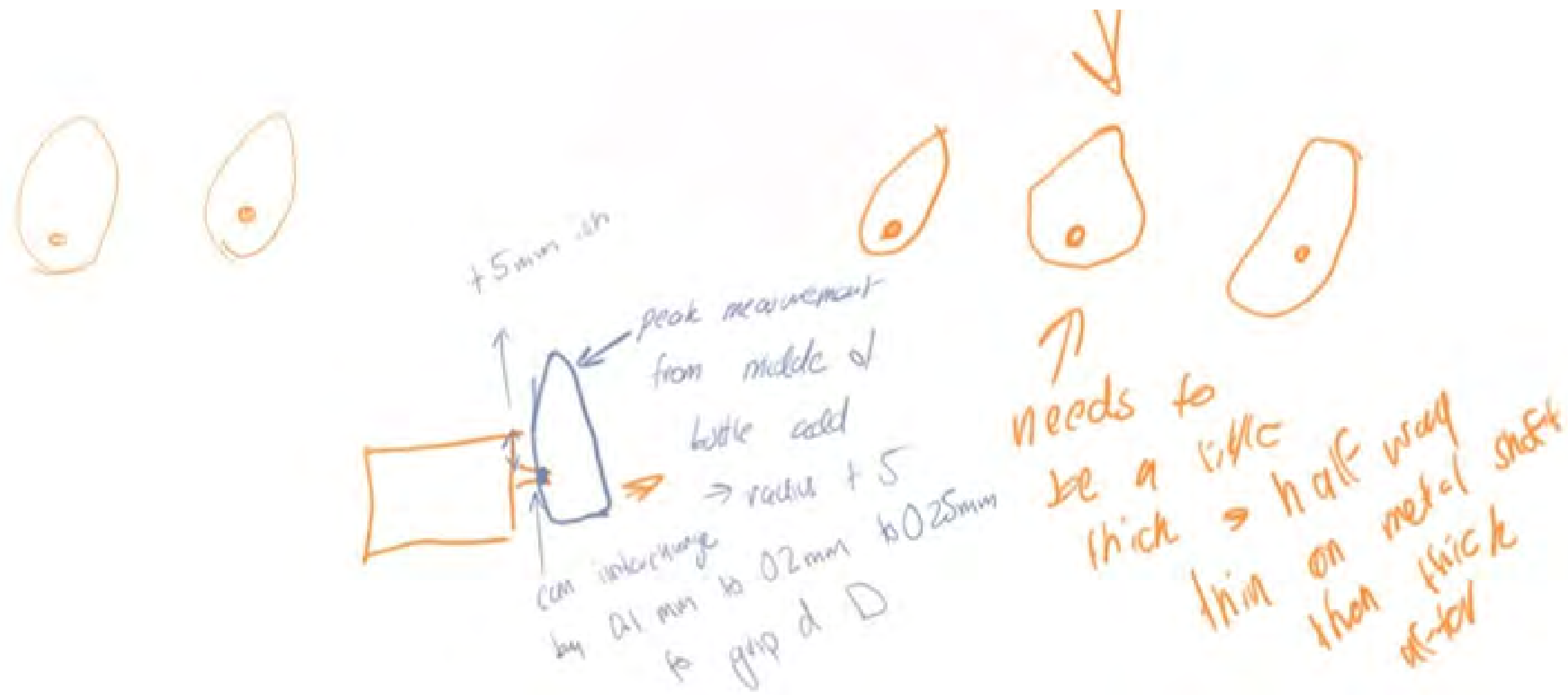
Squeezing Mechanism



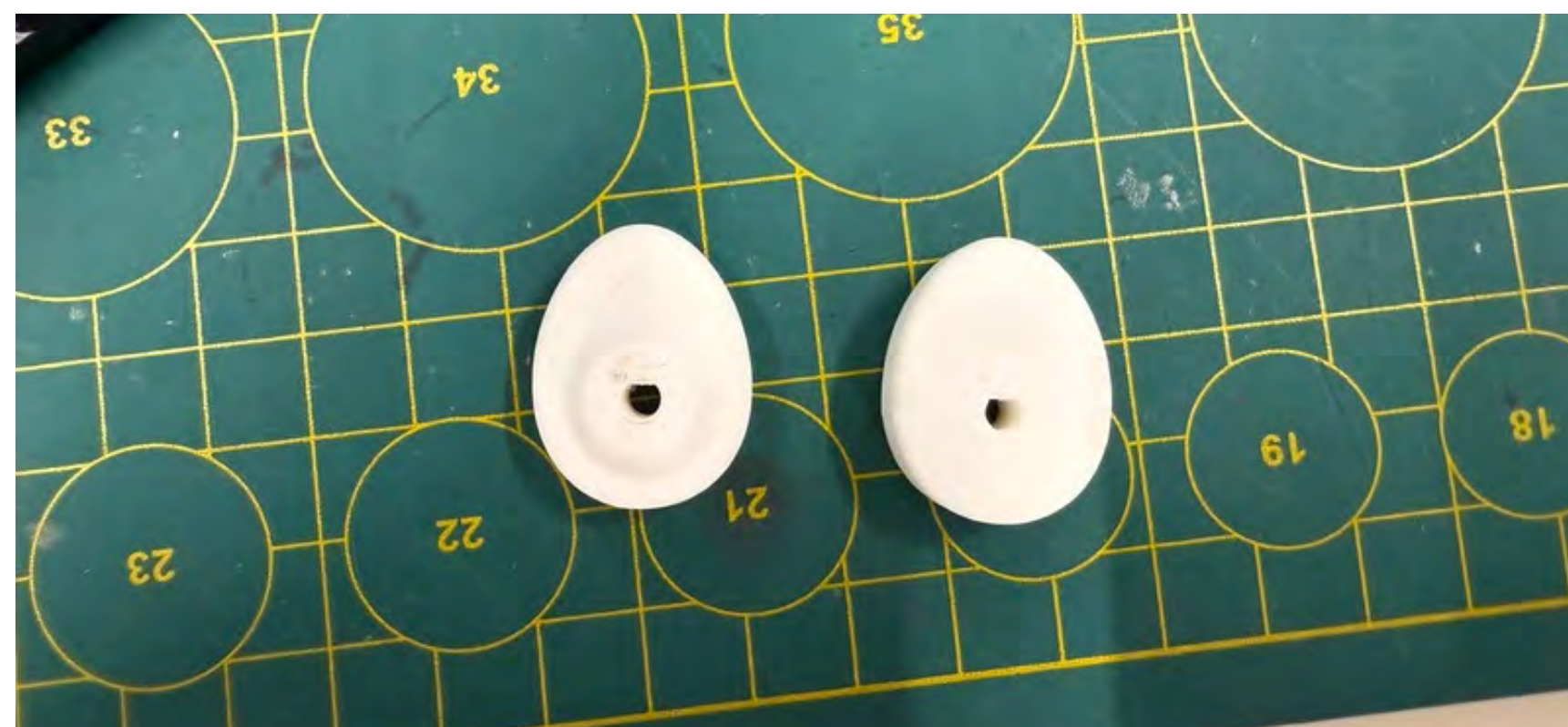
- Electronic Twisting works!
- powered by gearhead motor



Cam Mechanism



Cam Mechanism



Width = 20mm
Height = 6mm
Length = 25mm

HOLE

- 5mm - just right size to metal motor but needed to be heated and pushed on

Cam Mechanism



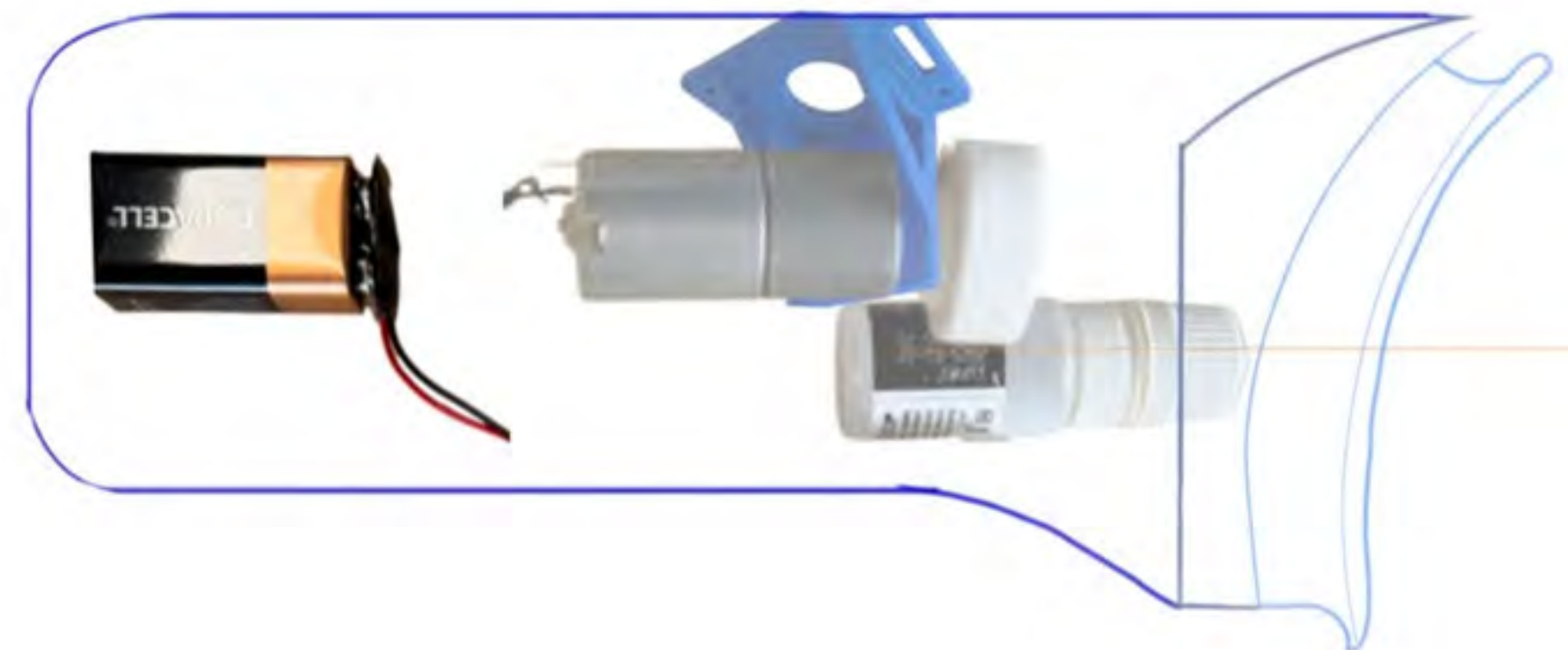
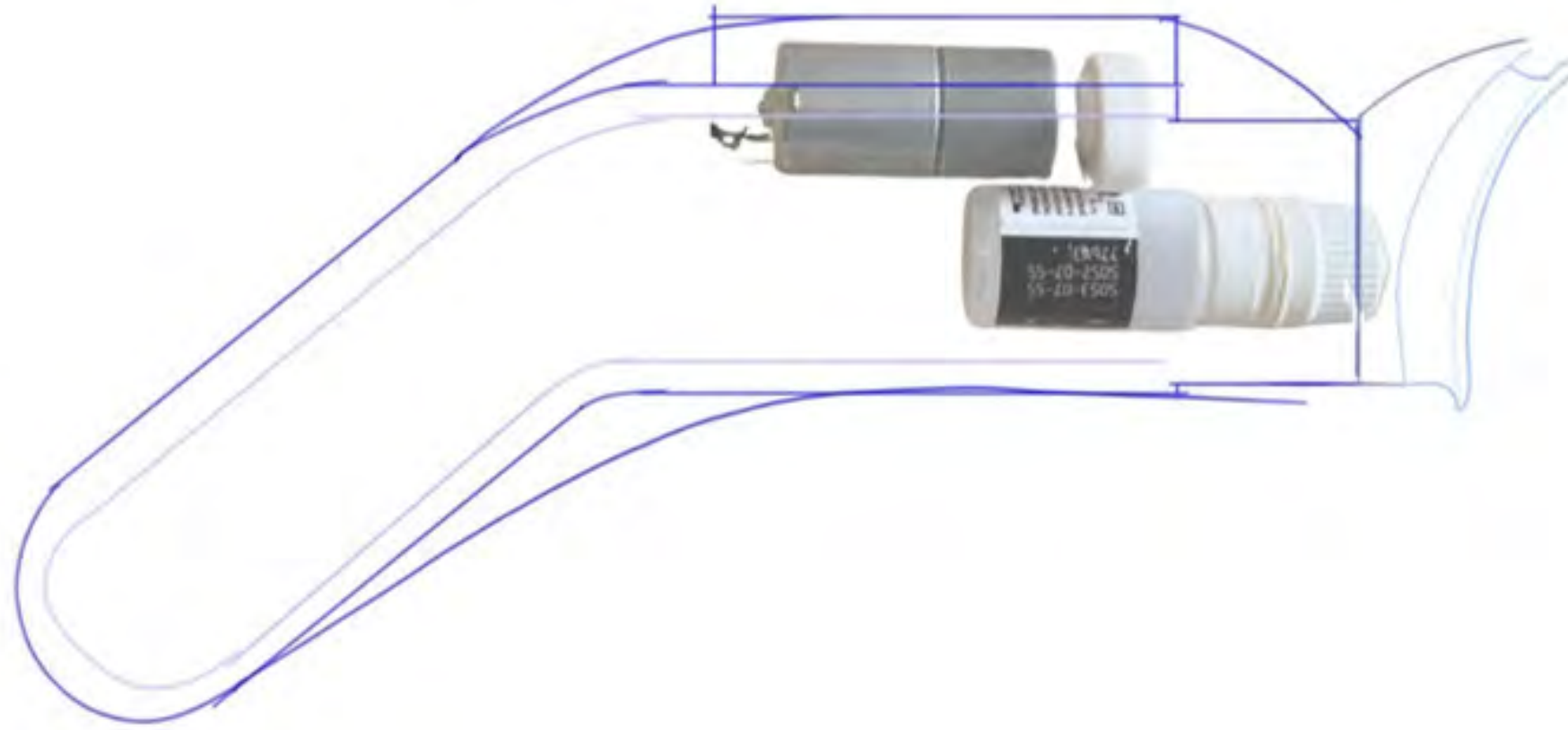
width - 90mm
length - 40mm

7.7cm(Length) x 2.9cm(Width) x 2.8cm(Height)

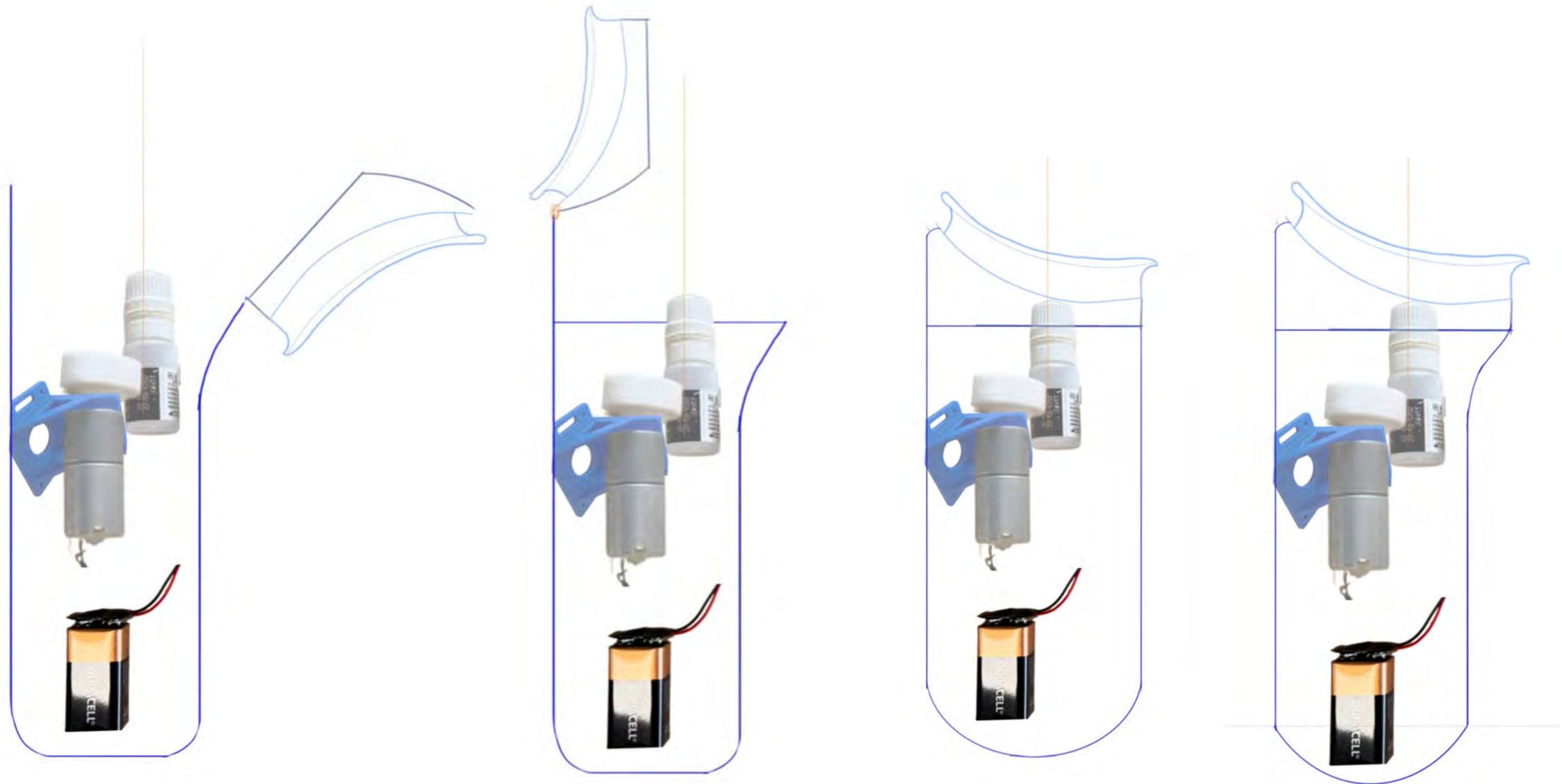
Cam Mechanism Positioning



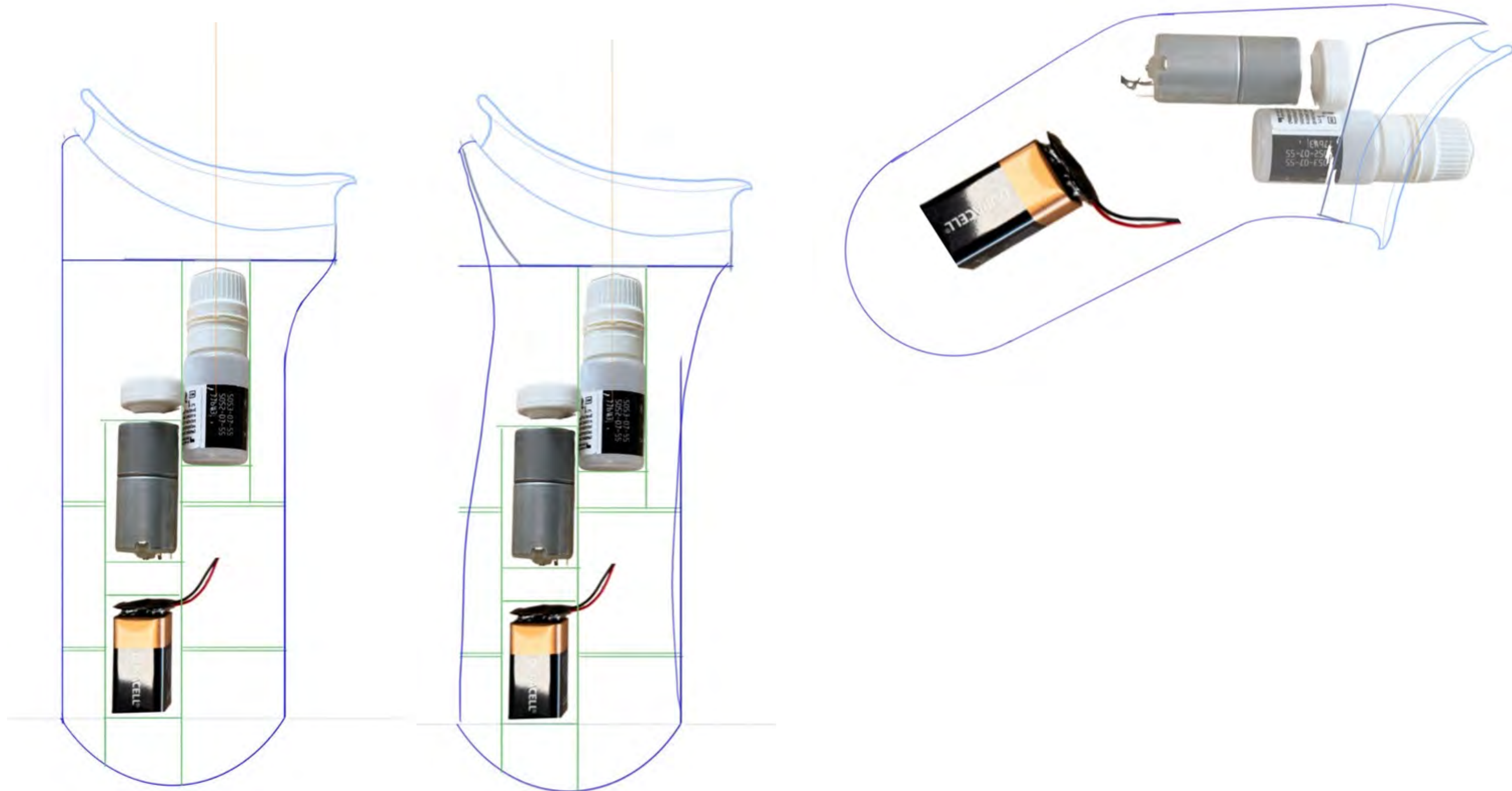
Cam Mechanism



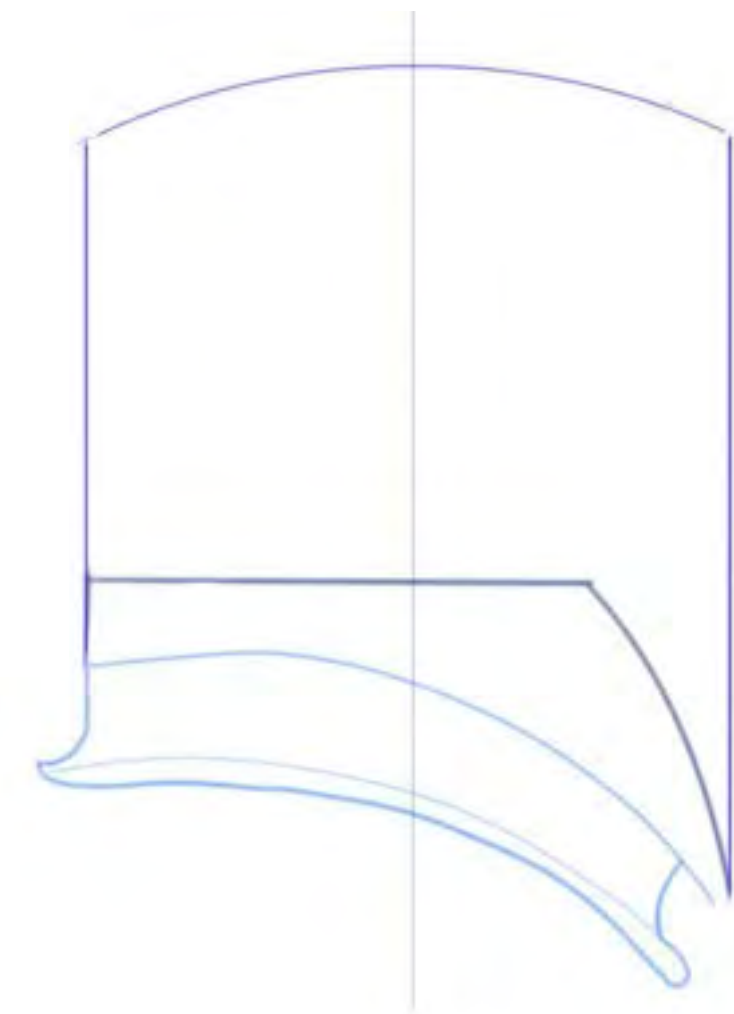
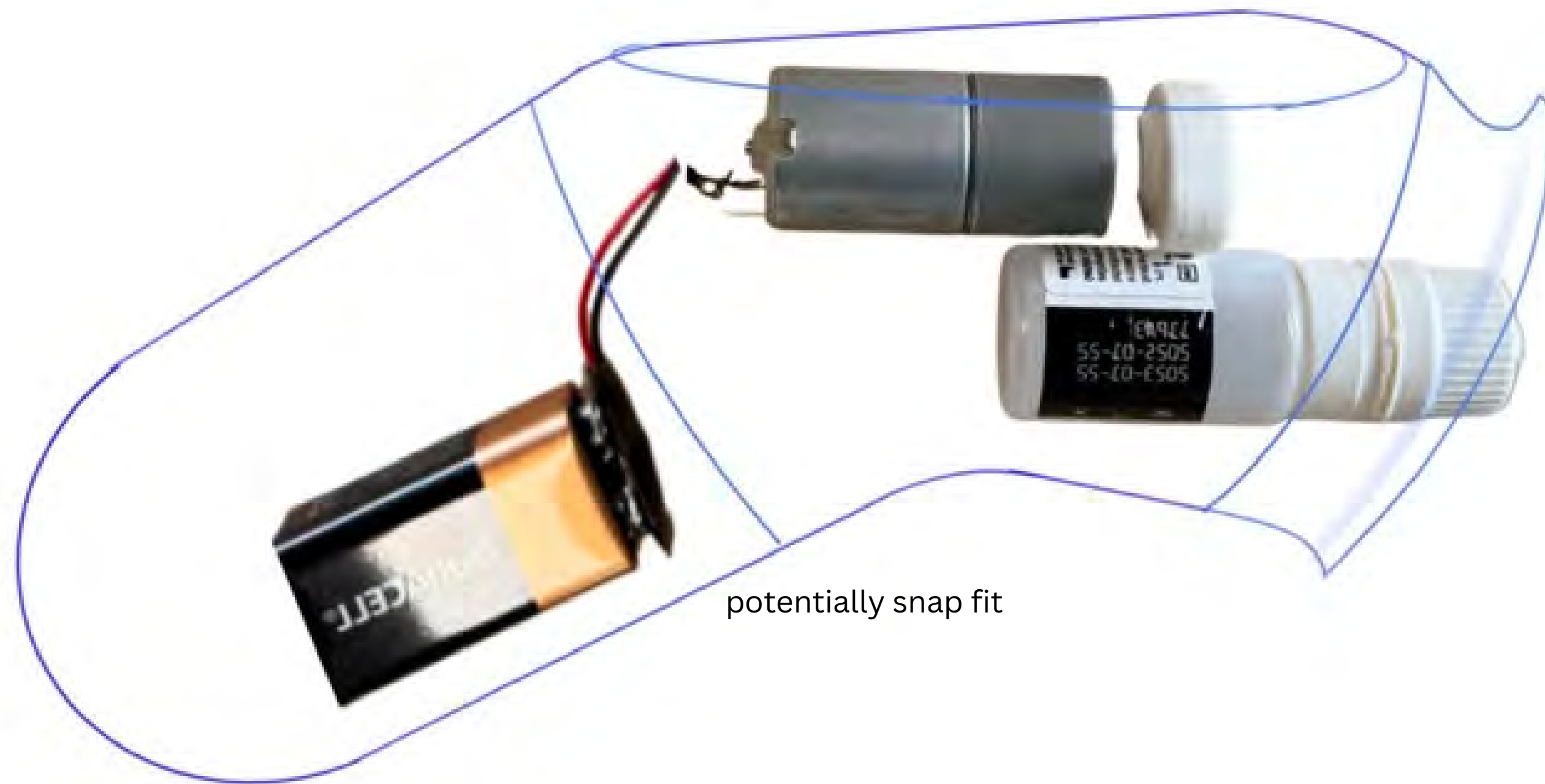
Cam Mechanism



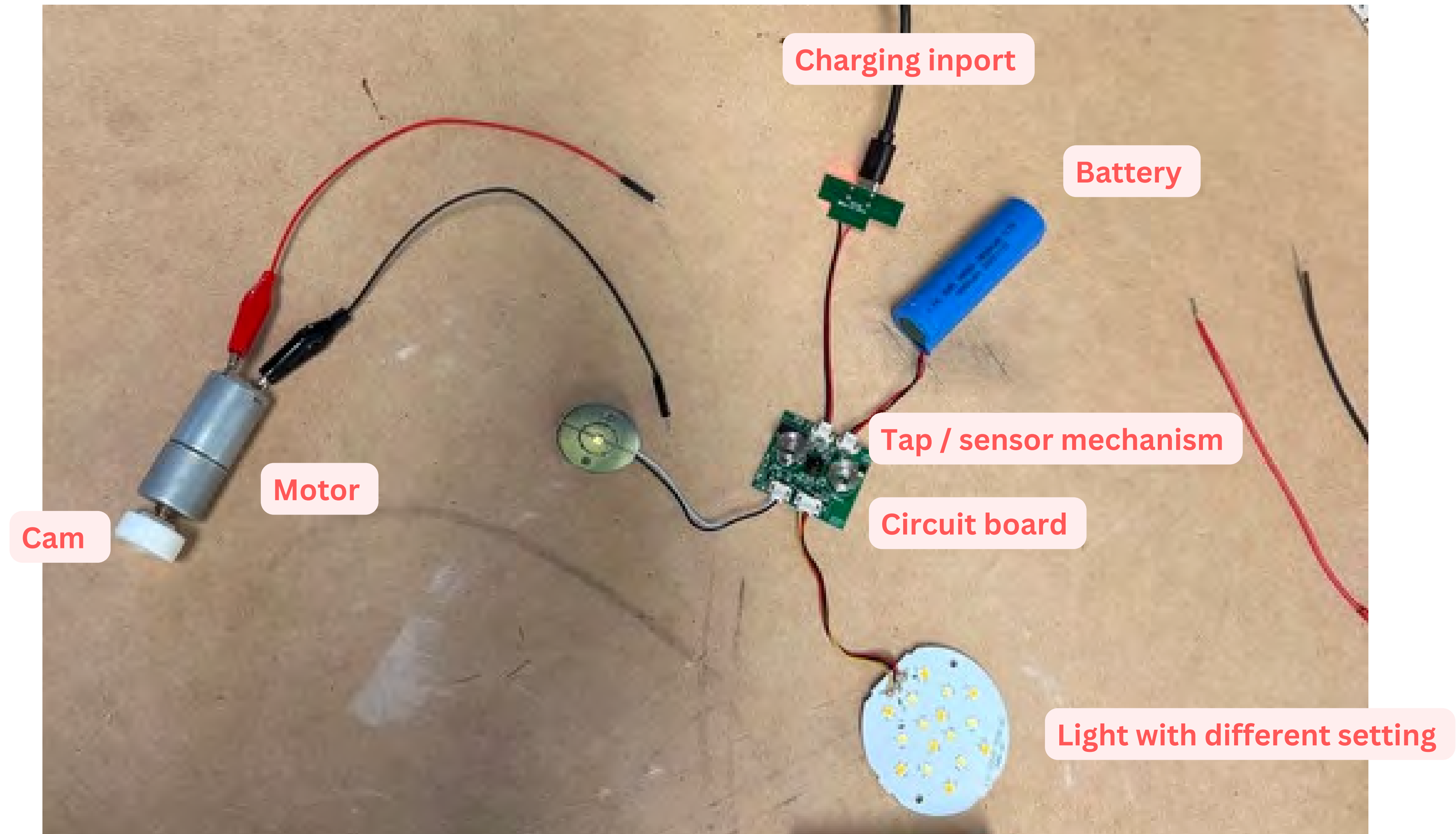
Cam Mechanism



Cam Mechanism



Cam Mechanism



Cam Mechanism



the following image was sketched by Dr Chris

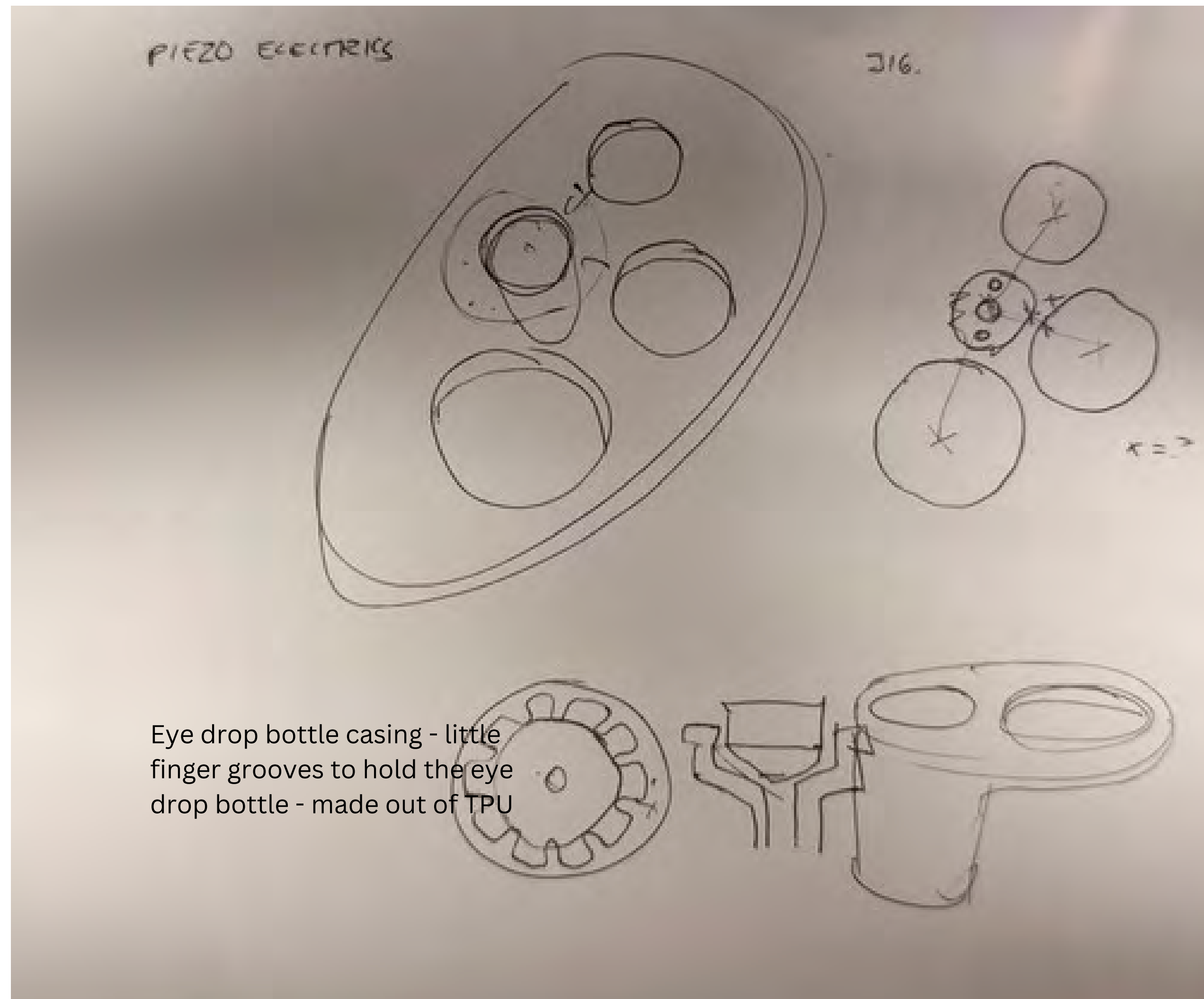


Figure out how large the diameter etc of the motor and how far away it need to be from the eye drop bottle

potentially how the motor and eye drop bottle go next to each other

Cam Mechanism

