

Process Book

UltraSight Electric Toothbrush + Smart Mirror

IDUS 491 | Jabria Oliver



User Personas & Storyboard

Quarter 1

Brian, 22 **frustrated devotee**

- A senior in college lives off-campus with one roommate.
- Struggles with balancing his thesis, commissions, and job interviews.
- Strict brushing habits for interviews.
- Believes in the importance of first impressions.
- Brushes and flosses twice a day.
- Rare bouts of lazy brushing due to time.
- Confused about why he keeps getting cavities.



Stephanie, 51. Todd, 50 **struggling couple**

- Married for 24 years, 1 child in college.
- Todd works full-time as a mechanic, Stephanie works part-time as a teacher and at the grocery store.
- Recently adjusted to electric toothbrushes.
- Both brush 1-2 times a day depending on energy.
- Trying to reduce monthly expenses.
- Confused about how to brush properly.
- Todd feels dental issues are inevitable.





OH! LOOKS LIKE MY DENTIST APPOINTMENT IS TODAY. I SHOULD BE FINE, I BRUSH WELL.

DENTIST

HI, I'M HERE FOR MY APPOINTMENT.

THEY WILL BE WITH YOU SHORTLY!

HMM, LOOKS LIKE YOU HAVEN'T BEEN FLOSSING.

UH I OO LOH?!

I'LL HAVE TO SET YOU UP FOR AN APPOINTMENT TO GET 8 FILLINGS

TOOTH DECAY?

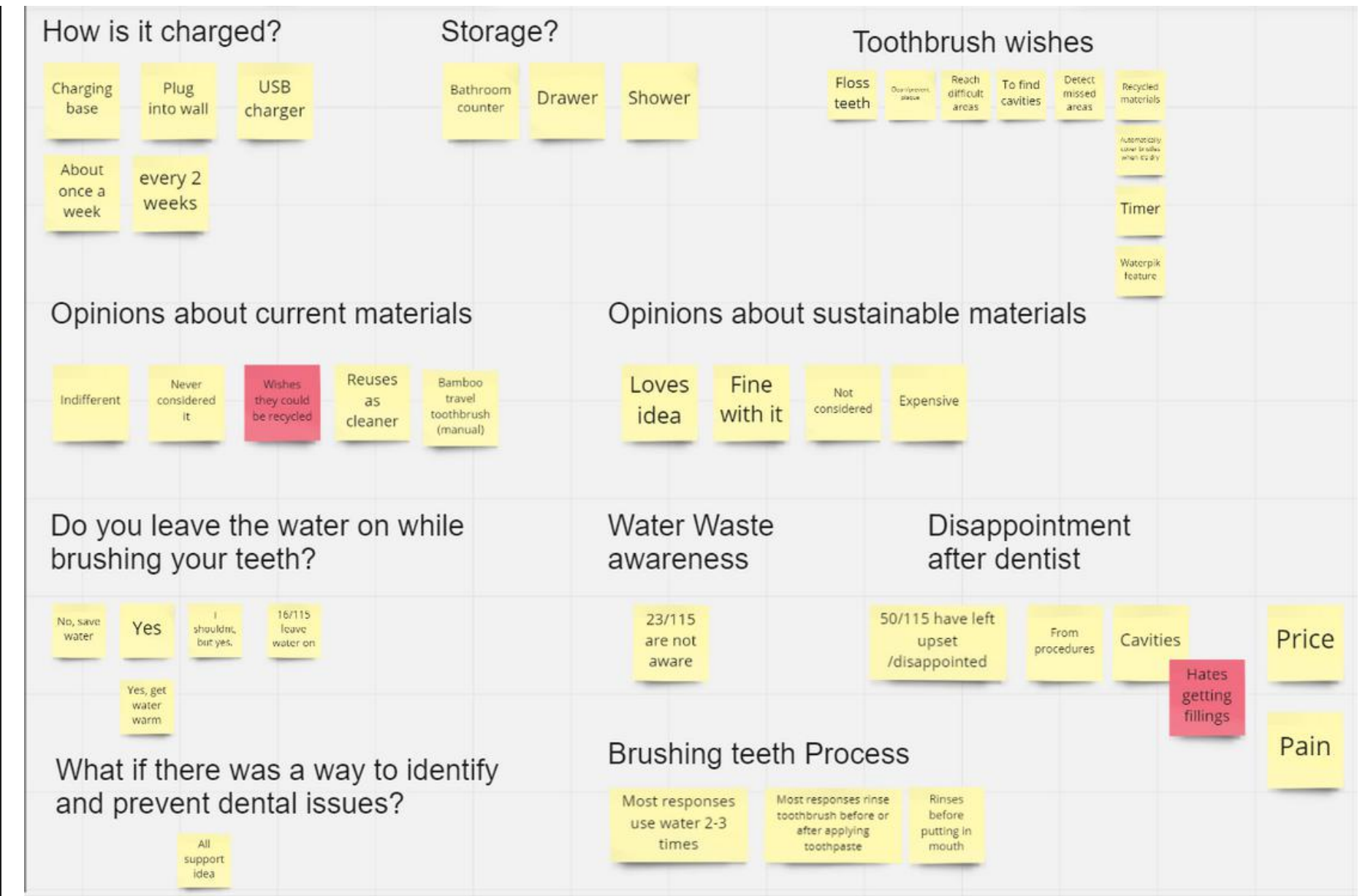
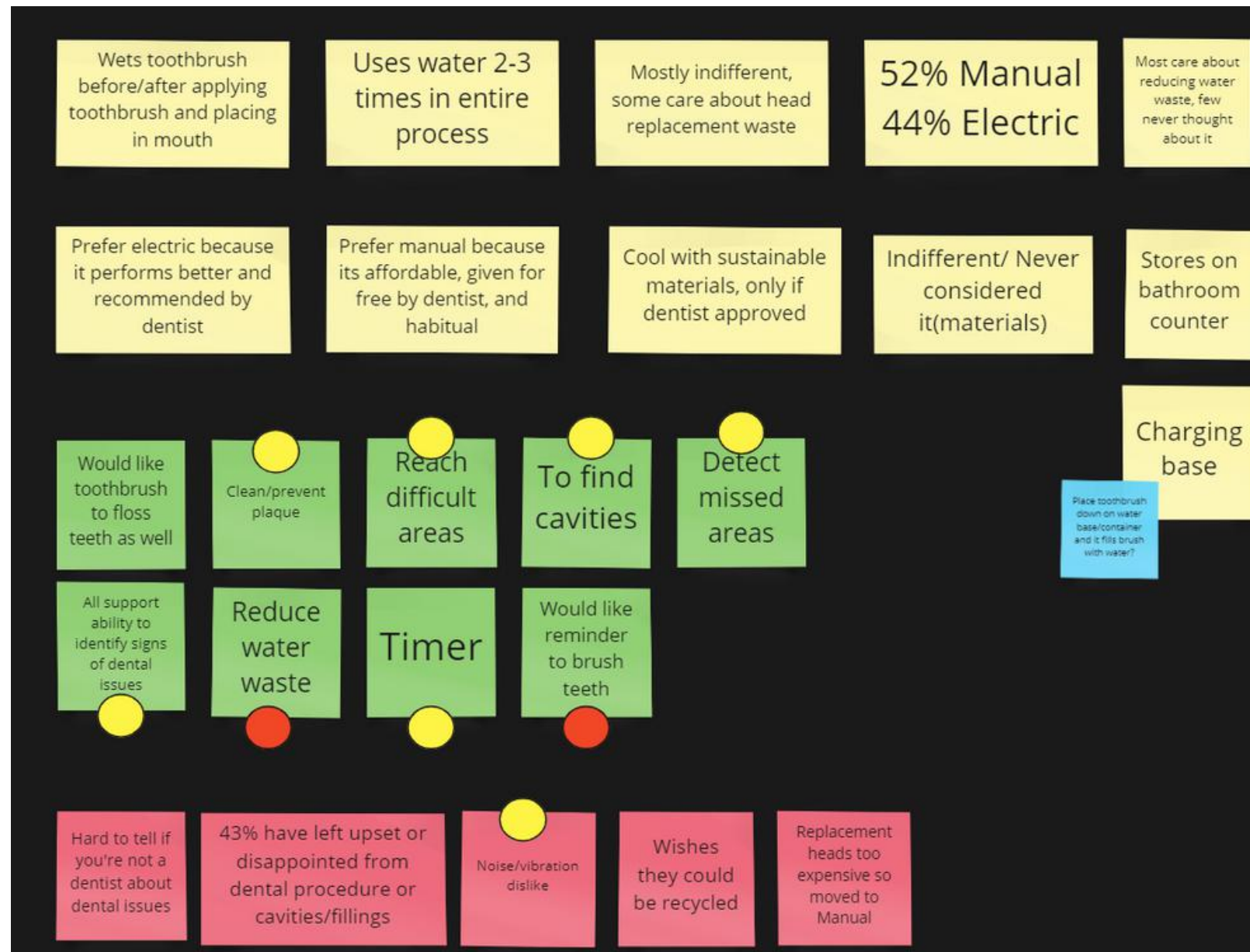
WELL, THERE IS ALOT OF PLAQUE BUILD UP, AND SEVERAL SIGNS OF SIGNIFICANT TOOTH DECAY.



Research

Quarter 1

Survey respondent's ages ranged from 30-50s



Interview #1

Female | 22 | College Student

How often do you brush your teeth?

Everynight, sometimes in the morning

Type of toothbrush, why?

Kids Quip toothbrush because it is affordable and I needed a good cheap electric toothbrush. Plus, I sucked at brushing my teeth when I was younger and electric works better. I don't use manual because it doesn't remove plaque well.

How often do change the toothbrush head?

My toothbrush doesn't need to be changed, but I can buy replacements. It hasn't yet needed to change because it's not old.

How do you feel about doing this? What do you want in a toothbrush? Why?

One that will get the plaque off easily, and a timer, that tells when 2 minute mark is up. Can feel plaque

In regards to material choices, how do you feel about current toothbrushes?

Could be more sustainable and they use alot of plastic that ends up getting thrown away a year later, not typically biodegradable, hard to make a wooden electric toothbrush but it would be cool.

What is your opinion of eco-friendly materials like bamboo and recycled plastic instead of the usual plastic for toothbrushes?

Would like to see a bamboo or wooden electric toothbrush, I know it's tricky but it would be cool

Interview #1 cont'd

Female | 22 | College Student

Do you leave the water on while brushing your teeth? If so, why? If not, why not?

No, because it's a waste of water. I just turn it on to wet my toothbrush

Are you aware of how much water is wasted when brushing your teeth?

If its on for 5 minutes that can be a whole gallon. Doesn't seem like a long time but its a lot.

Has there ever been a time when you left the dentist disappointed or upset?

Not really, just when they make my gums hurt.

Have you ever been diagnosed with any oral disease or cavity, issue that could've been prevented?

Only when I was younger, I had lots of cavities, but you cant detect that as wellHow do you feel about the ability to prevent something like this? Fairly, easily to maintain, but people with mental health programs, it's hard to negate, its preventable but its difficult. Would be nice for a toothbrush that had an app that reminded you to brush your teeth. It's nice to be reminded for a mentally disabled person, don't alway get the signals to do common things, poor self preservation skills.

Hard to tell if you are not a dentist- about dental issues. Normalize handing out signs of tooth decay.

Interview #2

Male | 23 | College Student

How often do you brush your teeth?

Twice a day

Type of toothbrush, why?

75% of the time regular, 25% electric- switches because the noise of the electric toothbrush has a regular at one home and electric at another home. Worried about the noise bothering other people.

Oral B toothbrush, now generic store brand from Aldi's

In regards to material choices, how do you feel about current toothbrushes?

Likes the hard plastic because its easier to clean, slightly bothered by toothpaste stuck on rubber of toothbrush

What is your opinion of eco-friendly materials like bamboo and recycled plastic instead of the usual plastic for toothbrushes?

Would be concerned about when its getting wet, how the material reacts when it's wet. Doesn't know enough about wooden toothbrush to feel comfortable

Interview #2 cont'd

Male | 23 | College Student

Do you leave the water on while brushing your teeth? If so, why? If not, why not?

No, because it feels wasteful.

Are you aware of how much water is wasted when brushing your teeth?

Yes, not sure of exact measurement. Does not want to leave it on the whole 3 minutes,

Has there ever been a time when you left the dentist disappointed or upset?

Walkthrough the process of brushing your teeth.

Wake up, grabs toothbrush rinses, turns off water, puts toothpaste on brush, then runs toothpaste under water, then brushes, occasionally lets water sit during winter for warmer water, spits out with water and rinses brushes, returns brush to holder on the counter/ places in closet outside of door.

Other responses

- Leaves the water running while they are flossing, but turns it off when brushing teeth
- A lot of interviewees/observations like to rinse their toothbrushes before brushing.
- Wouldn't mind a combination similar to a waterpik with brush.
- Turns water on and off while brushing to keep rinsing.

Landscaping & Positioning

Quarter 1



ORAL B iO 9

- 01 Oscillating.
- 02 Warns if you're brushing too hard.
- 03 Uses an interactive color display to help guide cleaning.



COLGATE PLAQLESS PRO

- 01 Sonic.
- 02 Ability to detect plaque with a blue spectrum light.
- 03 Provides live feedback about cleaning progress.
- 04 Interactive app that analyzes your brushing habits.

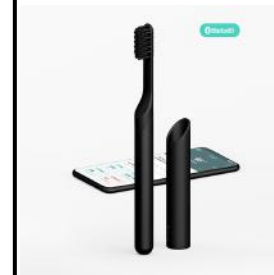
MY DESIGN

- 01 Ultrasonic toothbrush that breaks down and removes biofilm.
- 02 Bristles are infused with activated Phloxine B that detects and visually shows plaque buildup.
- 03 Tactile and visual responses signal tooth decay, plaque buildup, and completion of cleaning.
- 04 Less physical work for users.
- 05 Reduces trips to the dentist and saves water!

Oral Health Education



Plaque Prevention



Oral health education: Alerts about cavities, plaque, etc. Teaches better brushing habits.

Plaque Prevention: Effective at detecting, removing, and breaking apart biofilm.



FUNCTION

The corrective action presented is easy to understand. Such as the Quip app.

Plaque residue, tooth decay, and missed areas are easily identified and minimized by TBD, such as Colgate Plaqless Pro.

The hygiene data presented to the end-user is as intuitive and engaging to interpret. Such as the Oral-B iO Series 9 app.

Reduces water waste by 50%, such as the Waterpik Flosser.

FORM

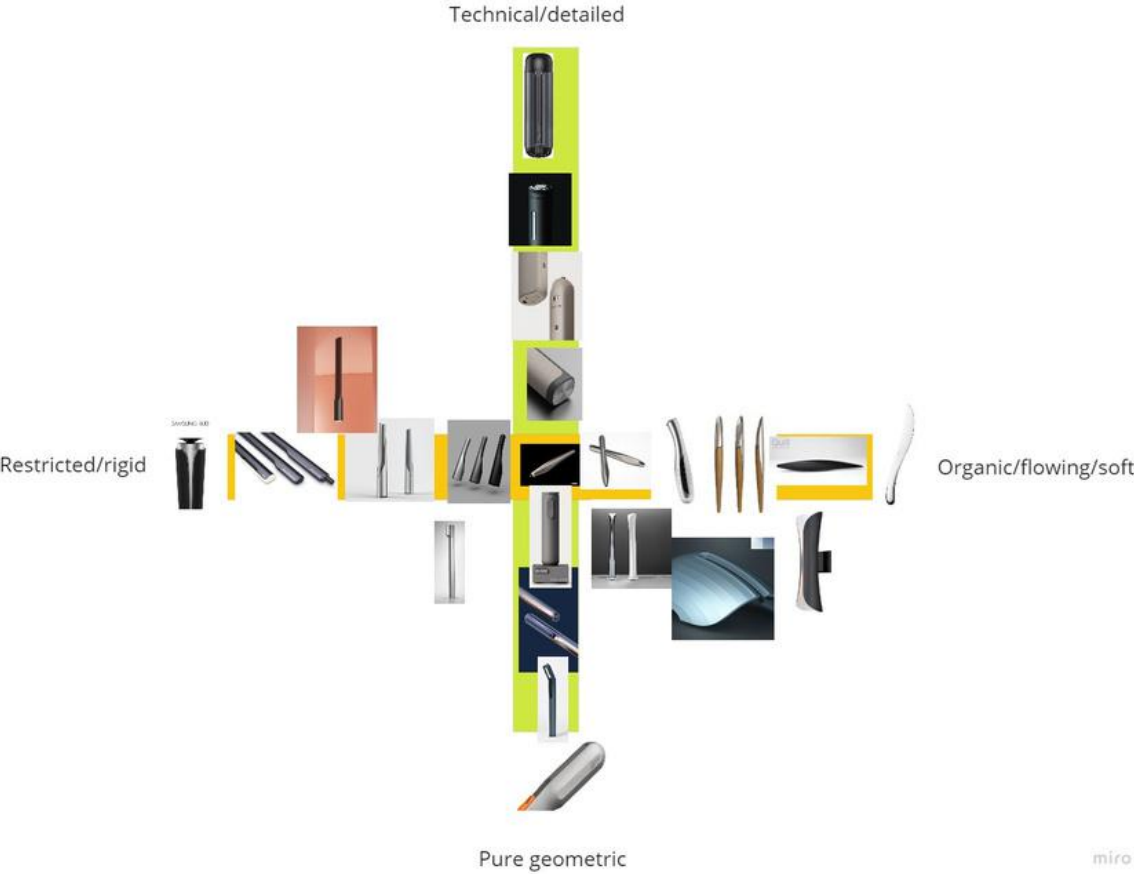
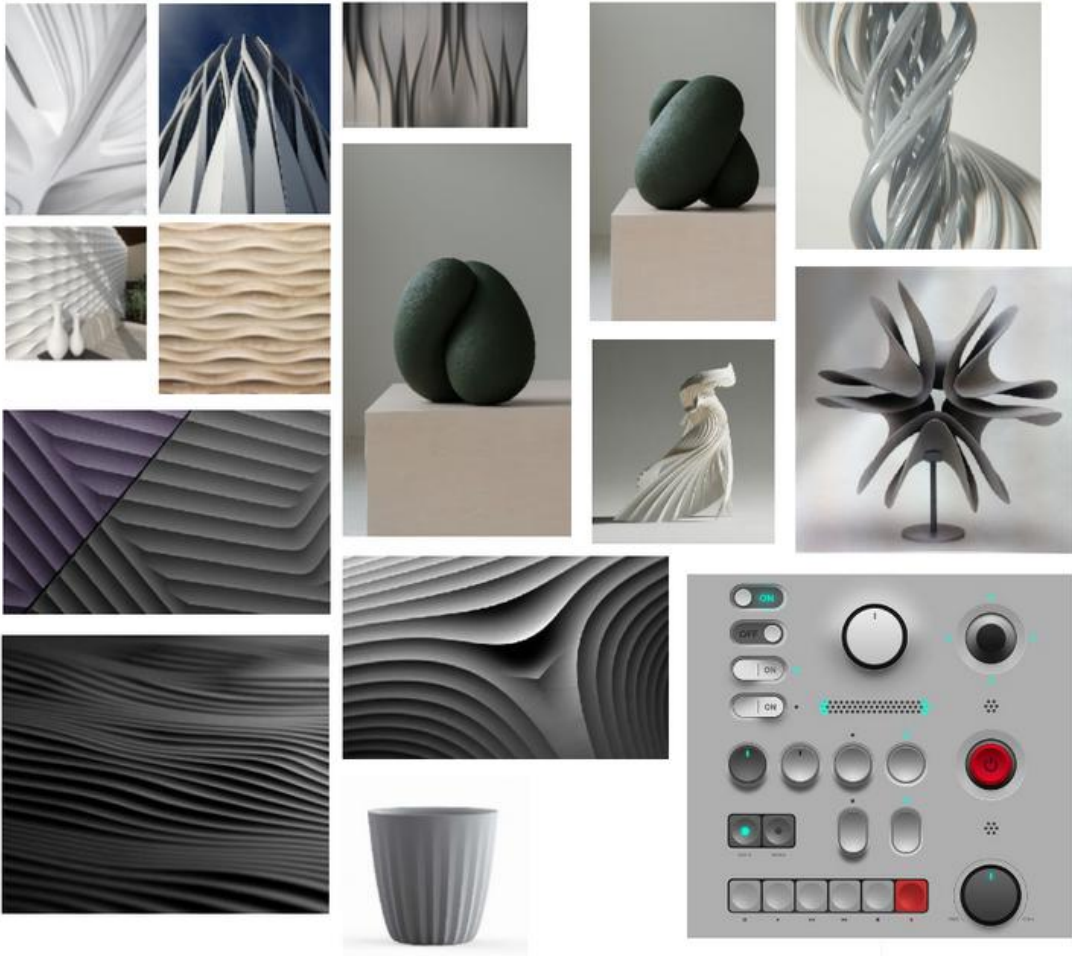
Overall size, weight, and hand fit are the same as the typical electric toothbrush on the current market.

The aesthetic primary read is confidence. Chanel No. 5

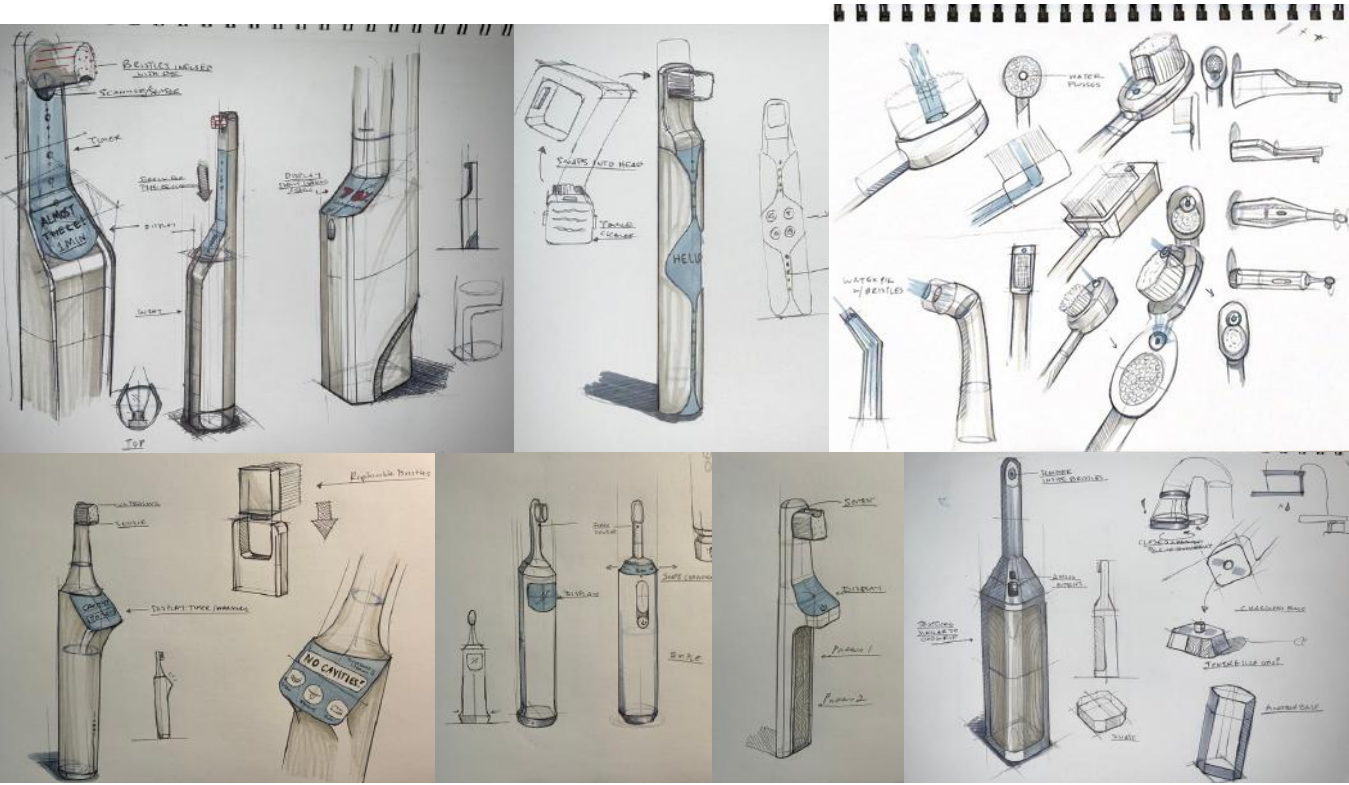
The aesthetic secondary read is reassurance.

Fits seamlessly into the user's storage environment.

Original Moodboard



miro



Direction Refinement

Quarter 1

User Needs based on Surveys

Reduce annoying vibration sound and feeling.	Reach difficult spots.	Keep track of brushing time.	Less reliance on the dentist.
To feel reassured about their oral health.	Alert about missed areas, plaque, and cavities.	Identify early signs of dental issues.	Reduce water waste.

that helped to develop the...

Design Criteria

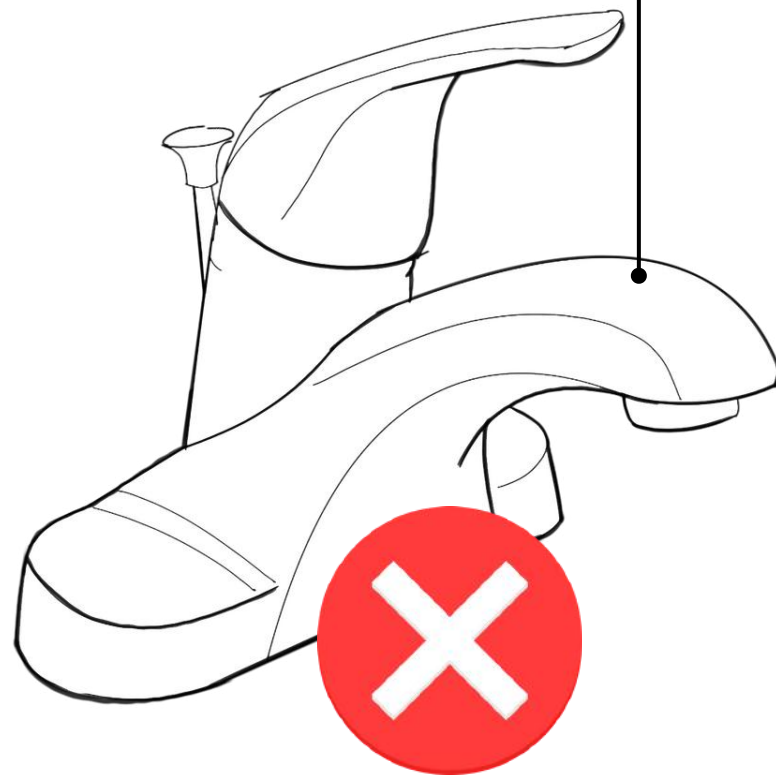
Easily identifies and minimizes plaque, tooth decay, and missed areas.	Hygiene data is intuitive and engaging to interpret.	The same size, weight, and hand fit as the typical electric toothbrush on the current market.
Limits accidental or purposeful water waste		

End User Feedback for various concepts

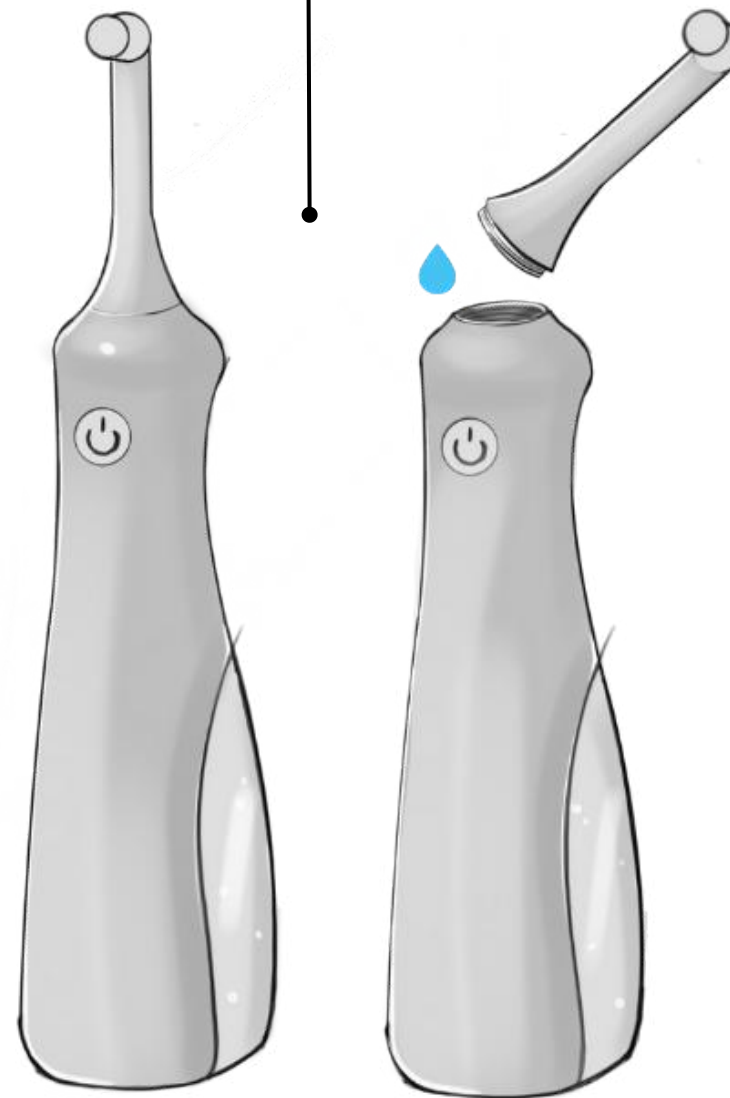
Quarter 1

Water Conservation: Inner Storage

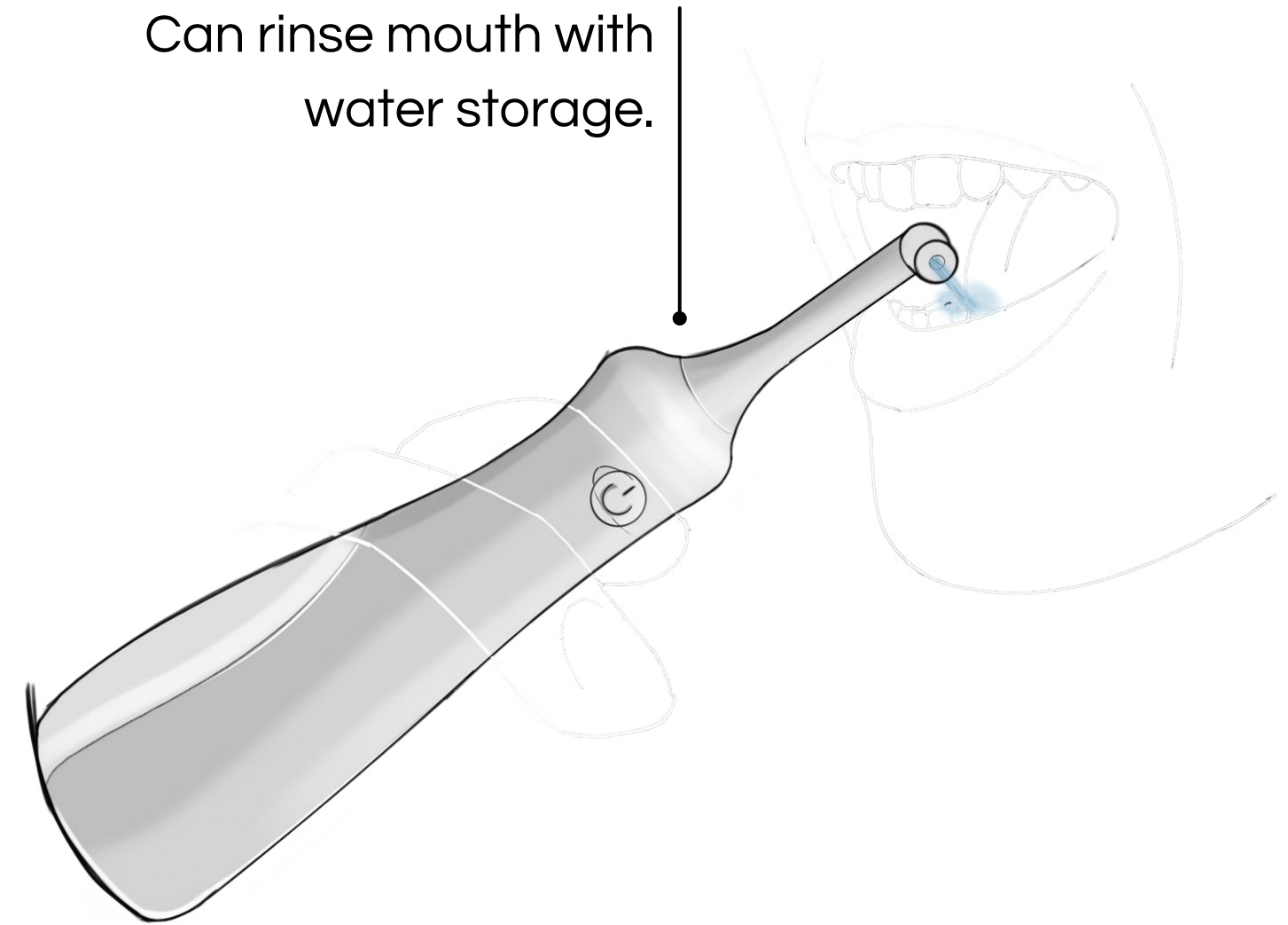
Will reduce need to
turn on the faucet



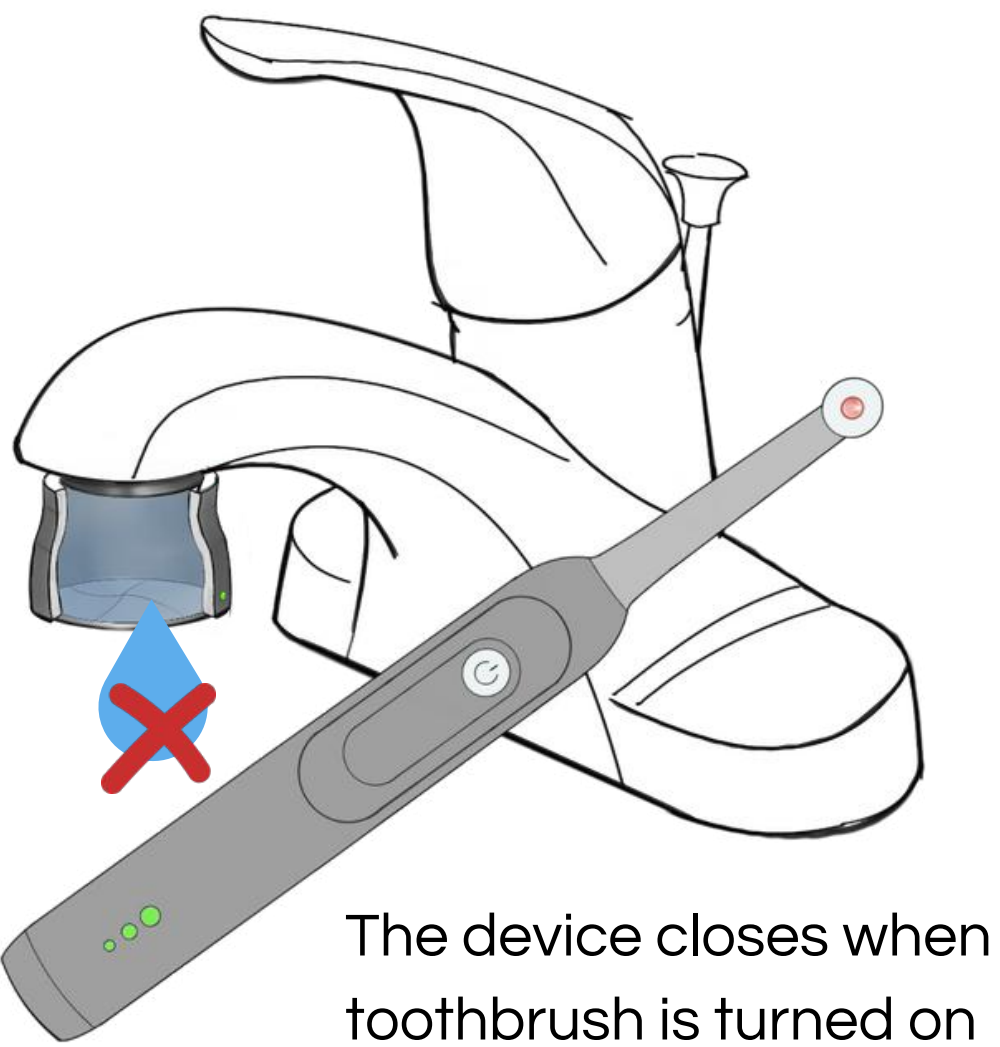
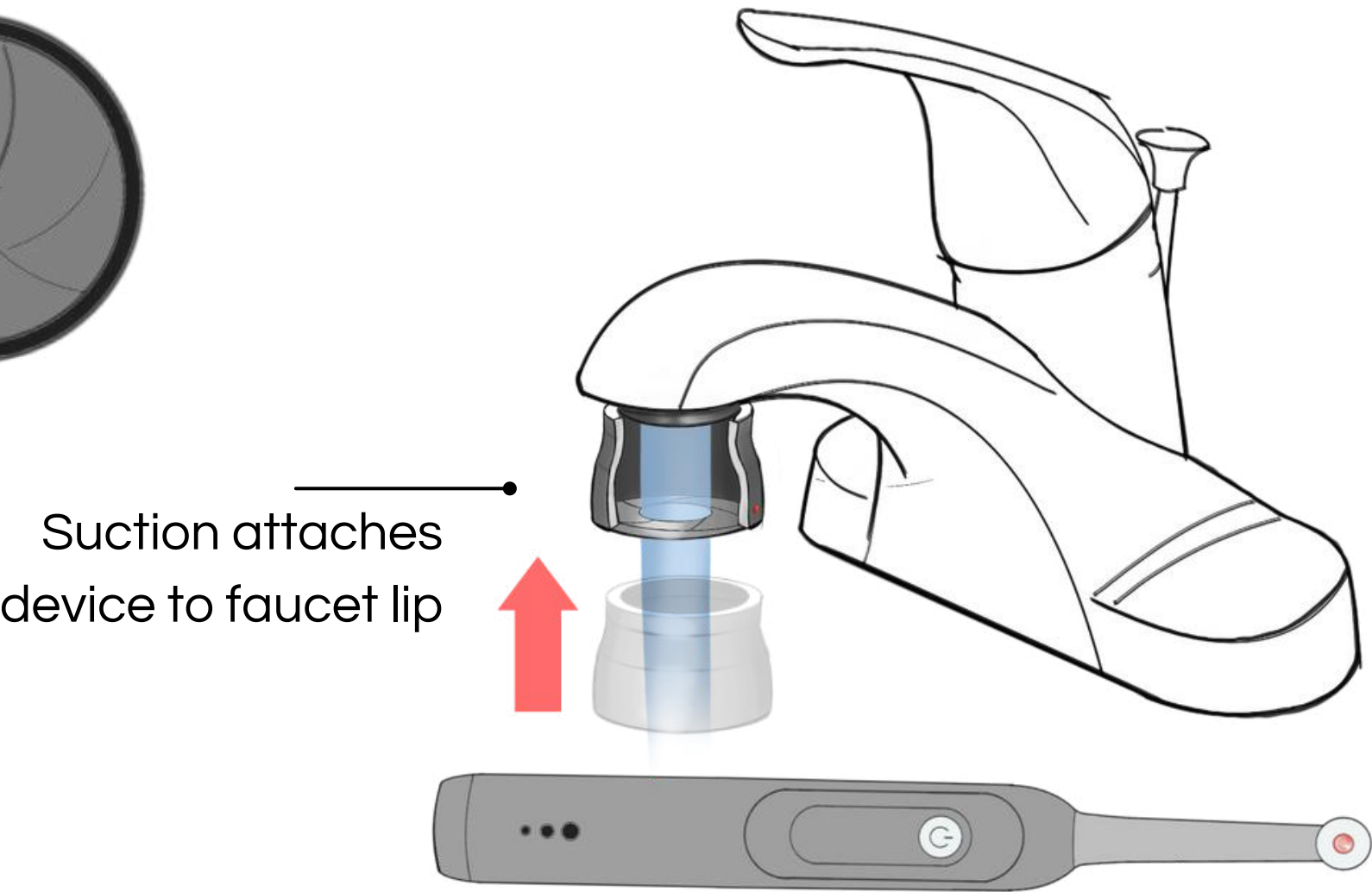
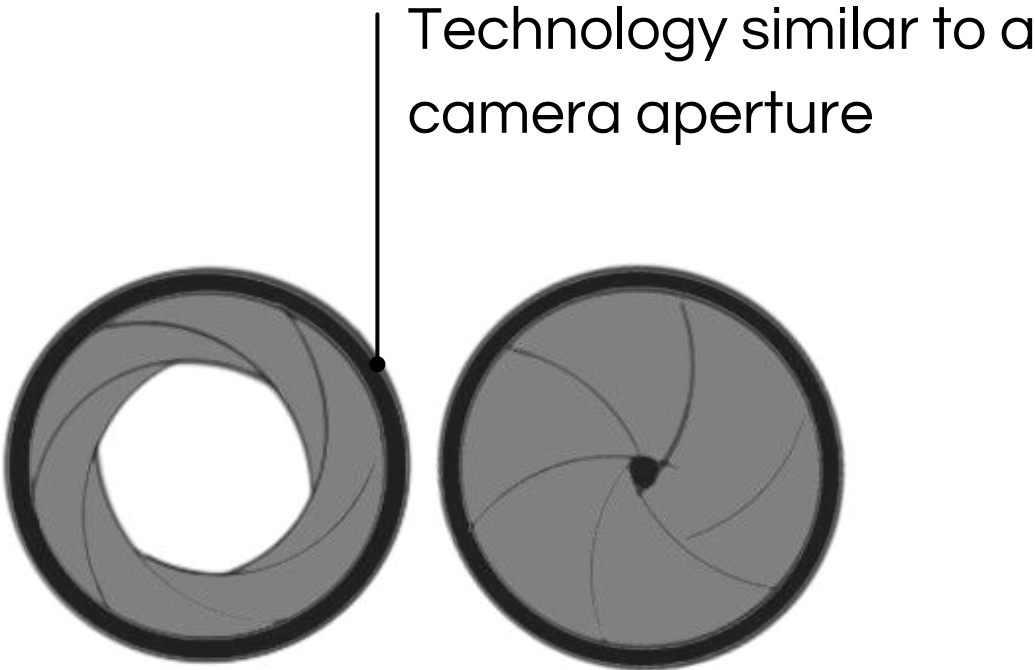
Unscrew toothbrush head to
refill water supply



Can rinse mouth with
water storage.



Water Conservation: Faucet Timer





Easy to install and use

Appears unobtrusive

Notification



Concerns about the shut-off feature

Unnecessary complexity

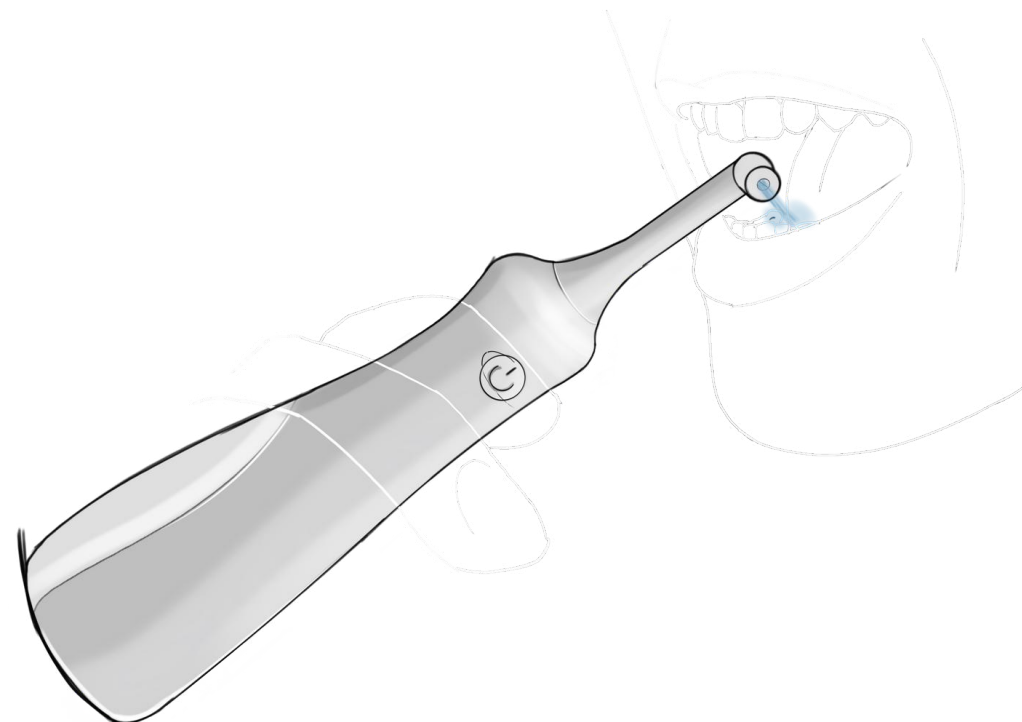
Annoying

Time span for water differs too much
from time to time

The less water used the better.

It disconnects people from the
running faucet altogether

Does not restrict their actions.

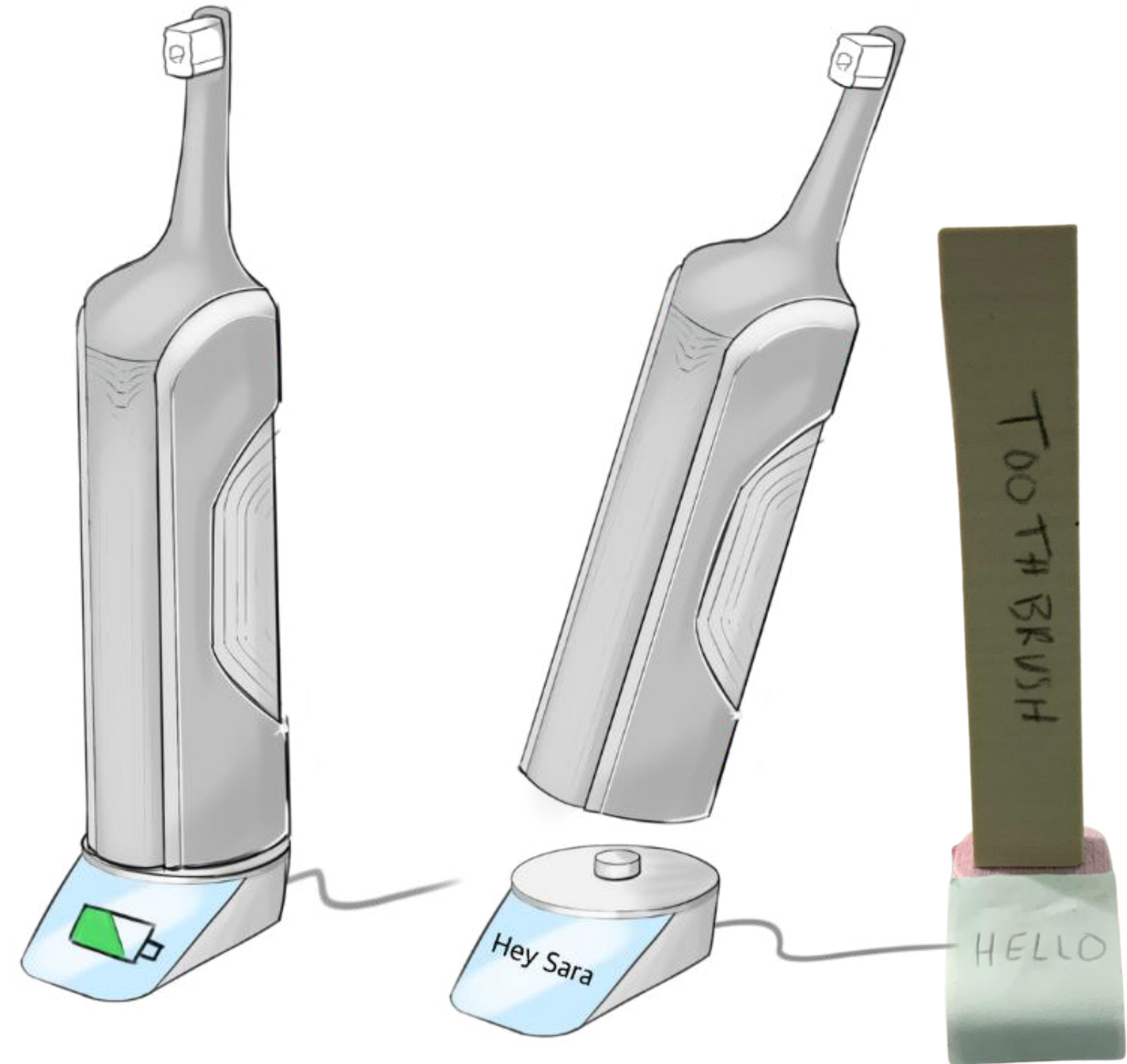


Not keen on rinsing from a reservoir
within the toothbrush.

Potential for mold growth.

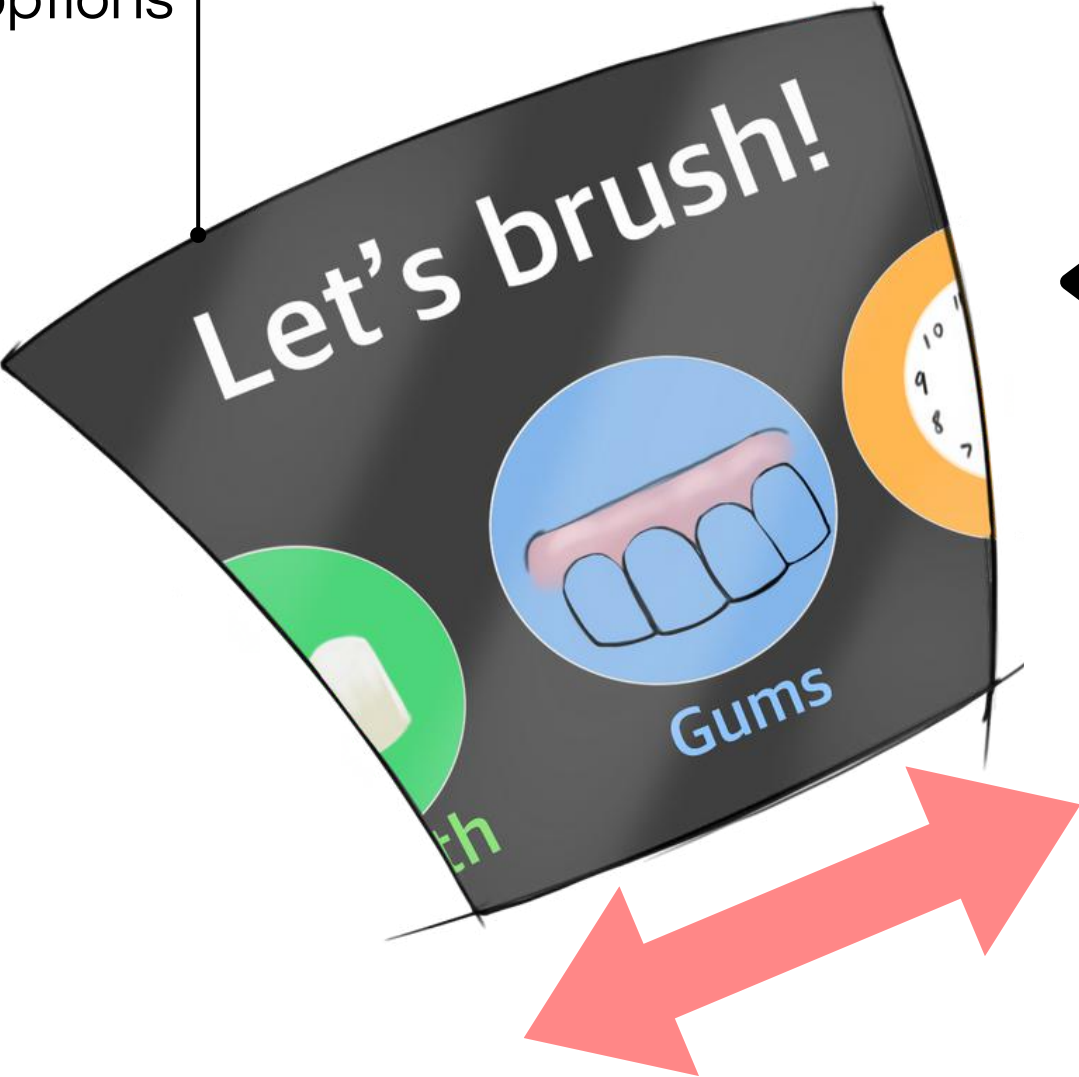
Concerned for weight of toothbrush
while filled with water.

Informational Display on Toothbrush Charging Station

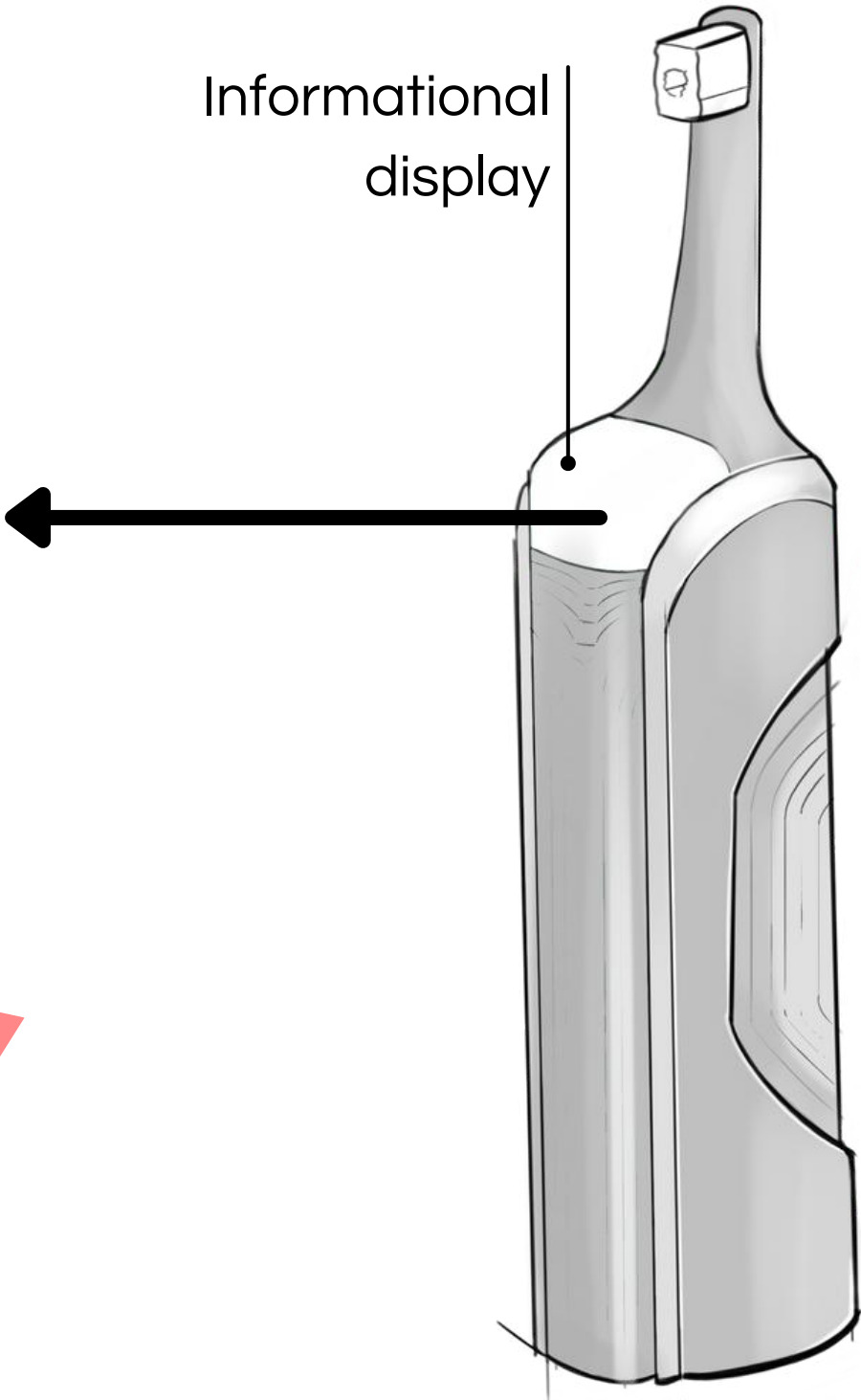


Informational Display on Toothbrush

Swipe to go through
features and options



Informational
display

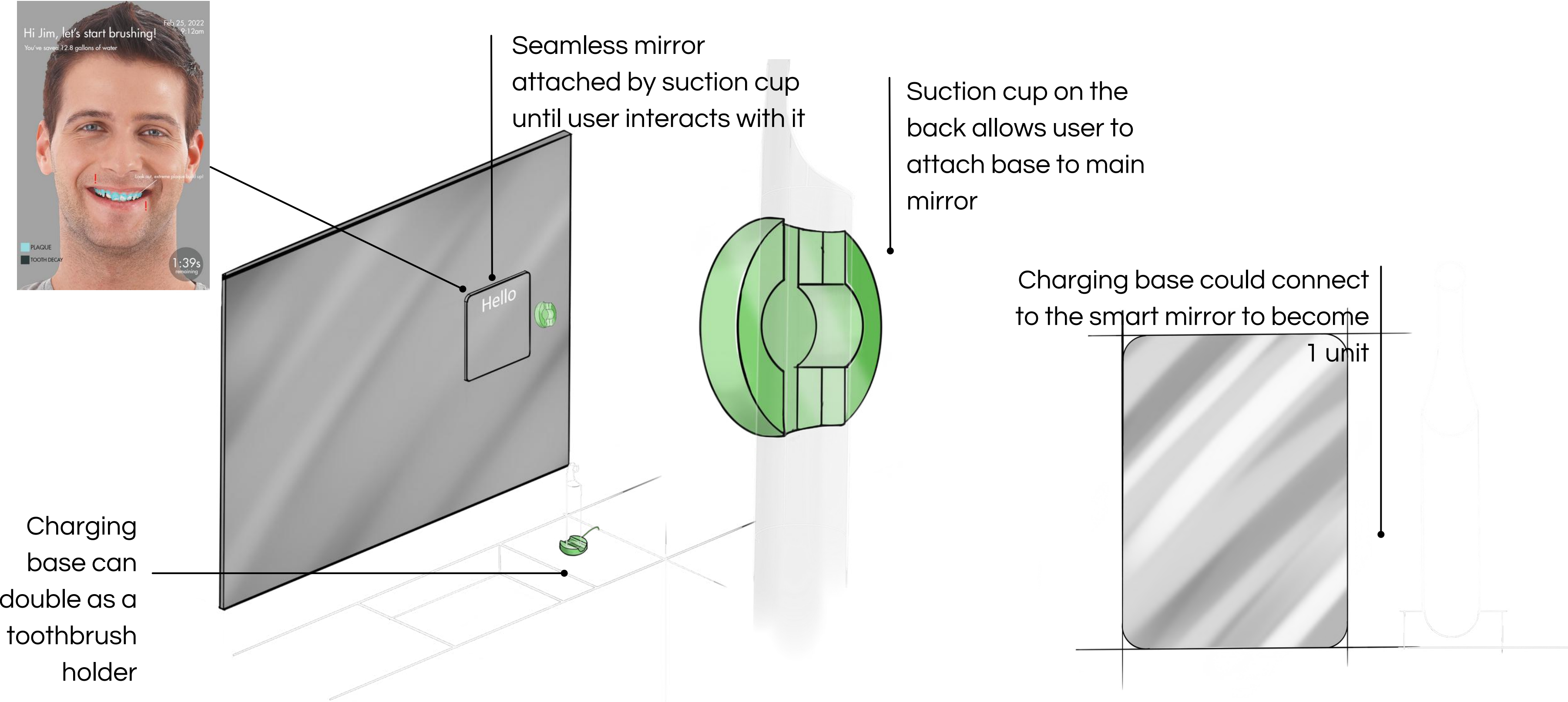




Example of how the Smart Mirror display would look.



Smart Mirror attachable to Main Mirror





Portable

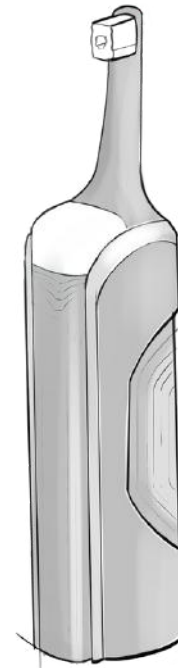


Typography will be too small

Hard to read

Portable

Similar to Oral B iO



I can't see it while brushing

Eliminates the need to take your
phone/app in the bathroom.

I can watch it in real time

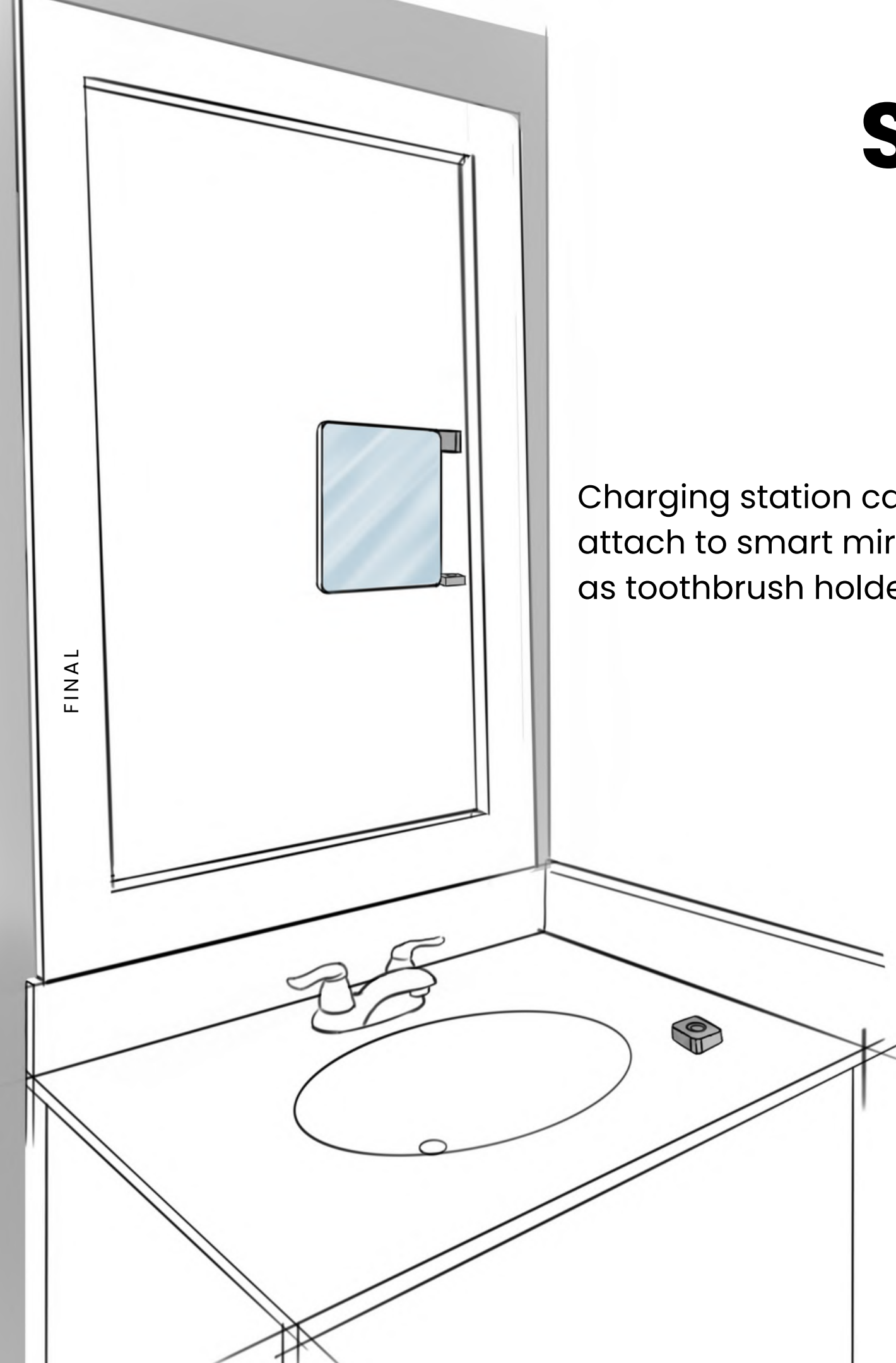


Need to bend down to see into the
mirror due to my height

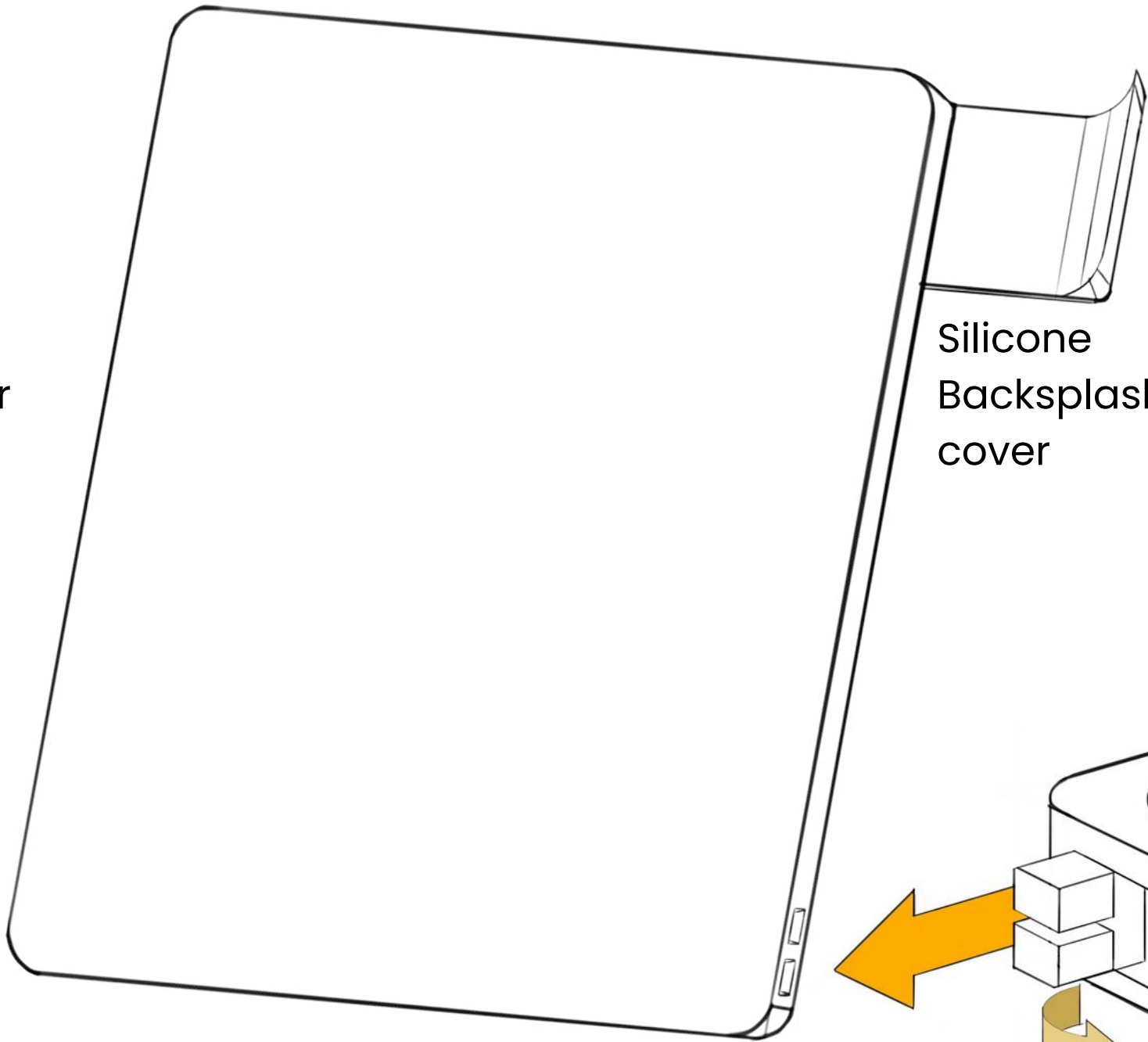
Concept Refinements

Quarter 1

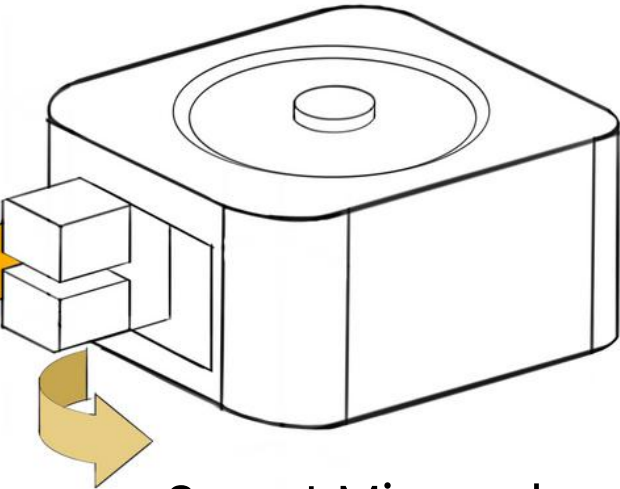
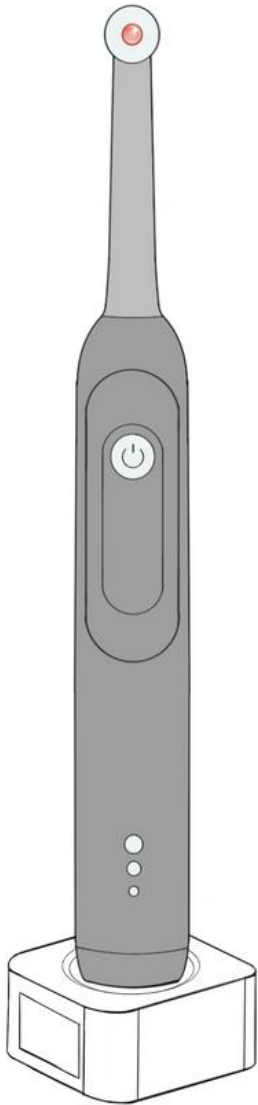
SMART MIRROR



Charging station can
attach to smart mirror
as toothbrush holder



Silicone
Backsplash
cover

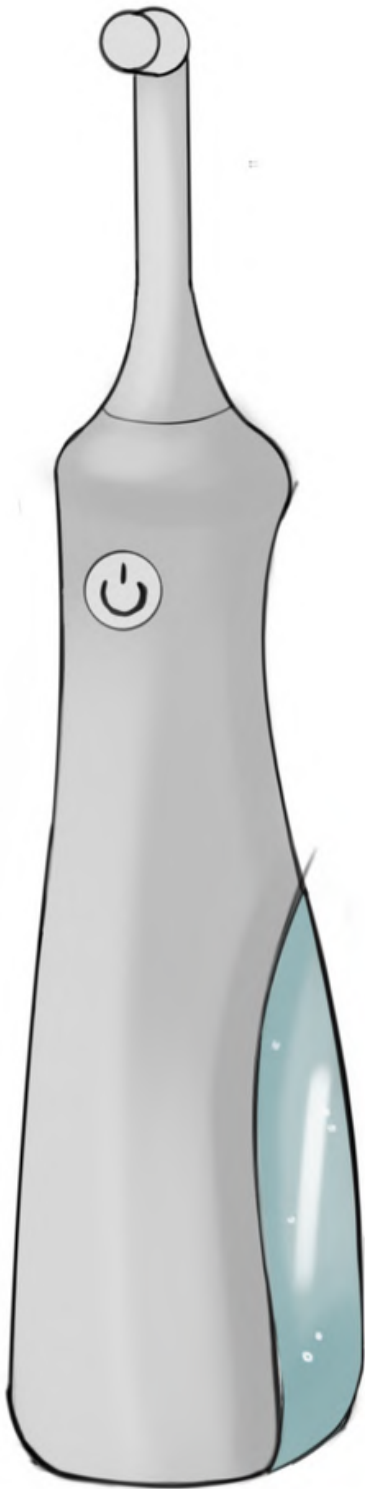


Smart Mirror charging station

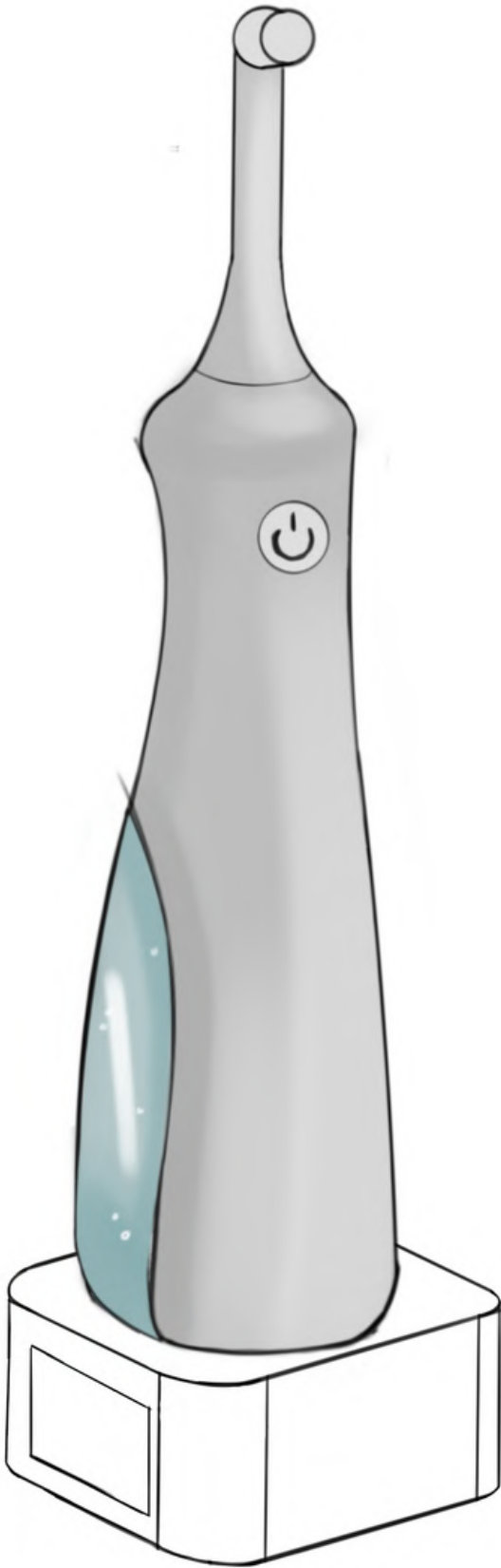
Reusable adhesive on back of smart
mirror and charging station

OPTIONAL VERSION

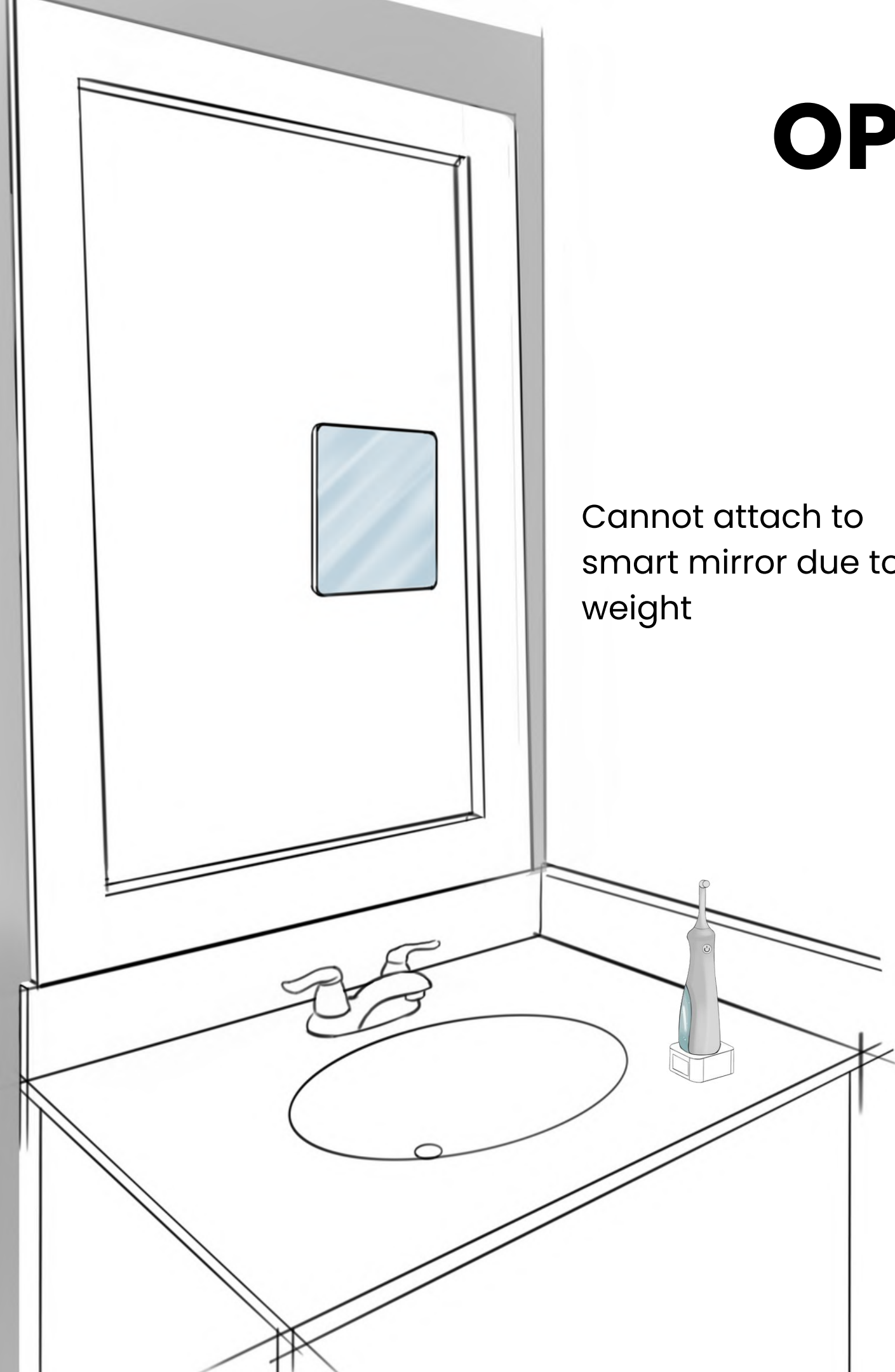
Cannot attach to smart mirror due to weight



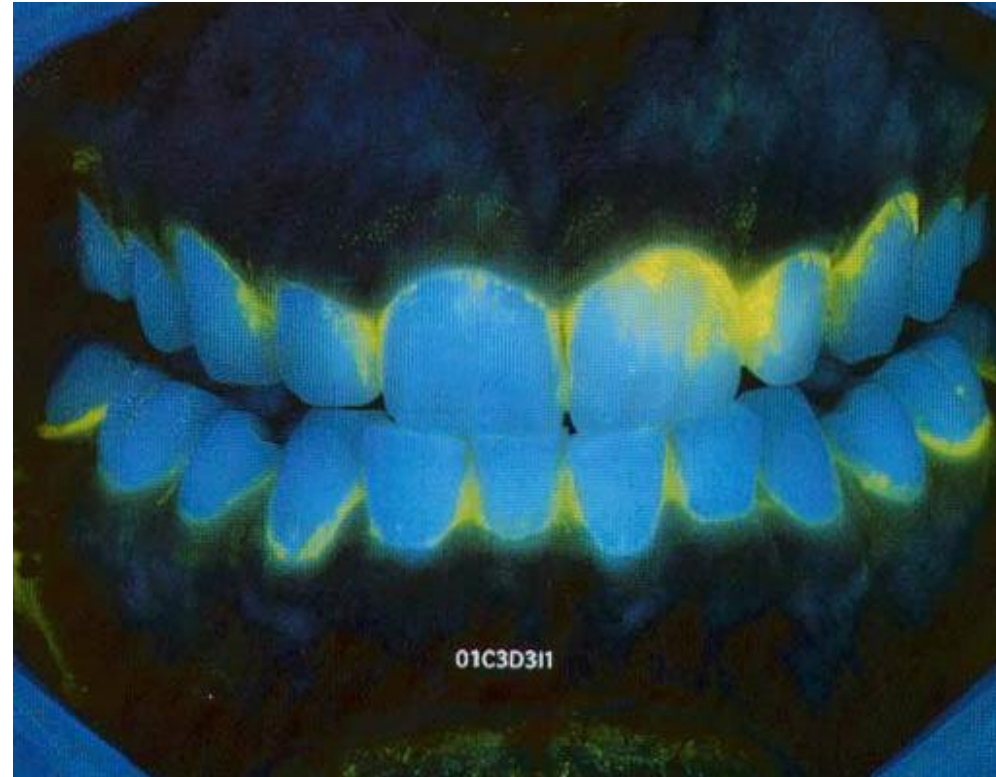
Refill by removing back storage



Charging station



HOW WILL THIS WORK?



UV light on plaque



Light reflections on tooth decay



AR Technology

The intraoral camera can also be used to detect cavities because it has a blacklight that can be used to induce fluorescence (basically, a glow) in your teeth. Healthy areas will glow more, but areas that are decayed glow less.

Concept Development

Quarter 2

Research for the toothbrush for development.

Bristle patterns

Block: A brush with block patterned bristles has all the bristles the same length and aligned neatly like a block.

Wavy or V-shaped: A brush with wavy or v-shaped bristles has bristles that form a v-shape from a side view. This design is meant to give you better access to the areas around tooth surfaces.

Multilevel trim pattern: Multilevel brushes help clean difficult areas between teeth and on the tooth head.

Criss-cross pattern: Brushes with criss-cross patterns and rubber bristles on the sides help to lift up plaque effectively.

Polishing bristles: Brushes with multilevel bristles and rubber-like circles at the centre help clean surface stains.

Oscillating(rotating) toothbrush works better than vibrating

Avoid sonic(back and forth bristle movement, user has to move brush back and forth)- has annoying noise/vibration

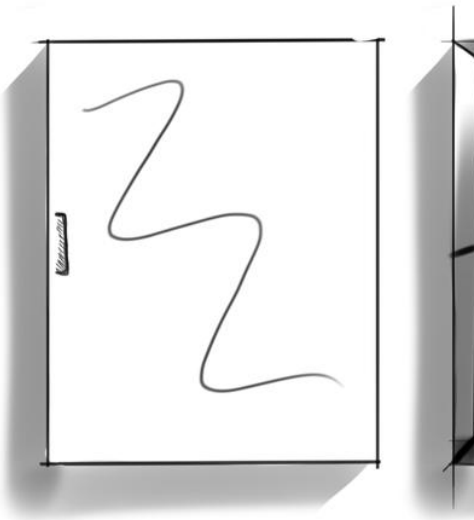
Ultrasonic- best movement, less work for user, just has to place on tooth, the bristles are vibrating at ultrasonic frequencies

Conventional toothbrush heads are rectangular and are designed to effectively clean the surface of each tooth.

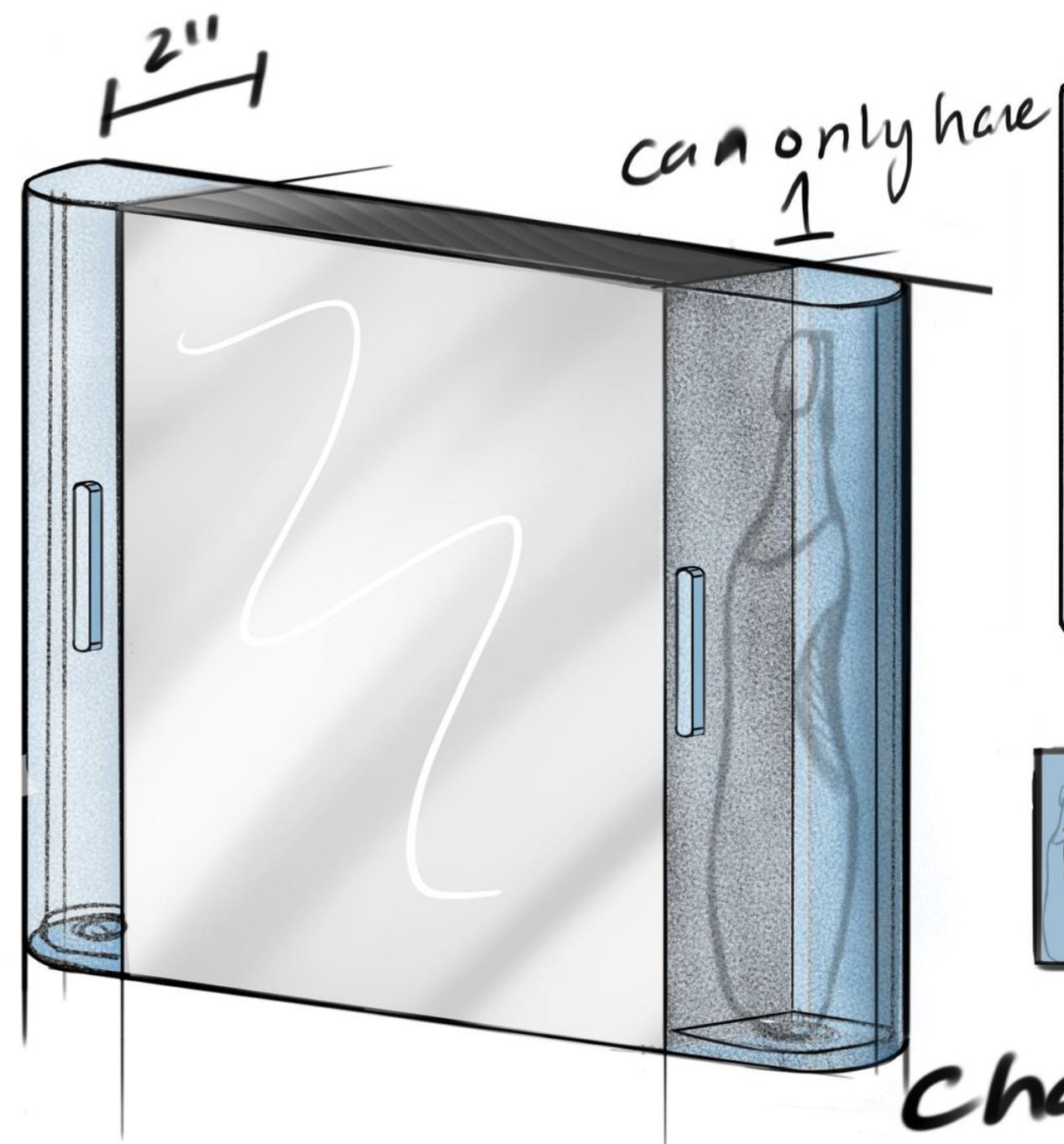
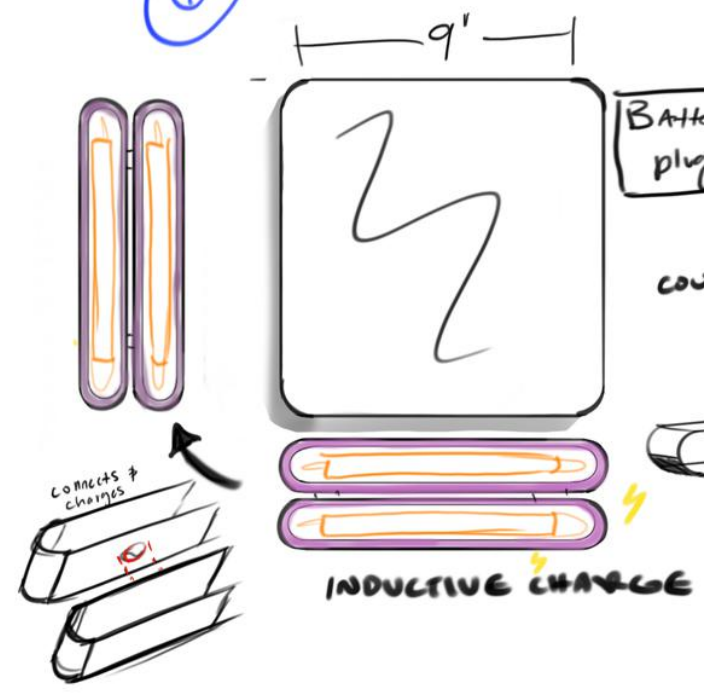
Diamond toothbrush heads are, as the name suggests, diamond shaped and slightly more narrow than conventional toothbrush heads. Diamond toothbrush heads are to help you reach the teeth in the back.

Moving forward, I decided not to continue with the water conservation because it didn't add anything to my goals.

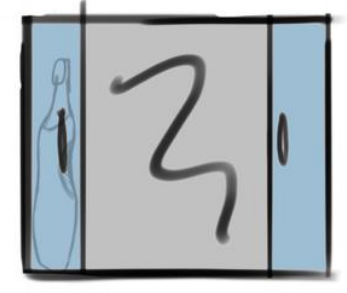
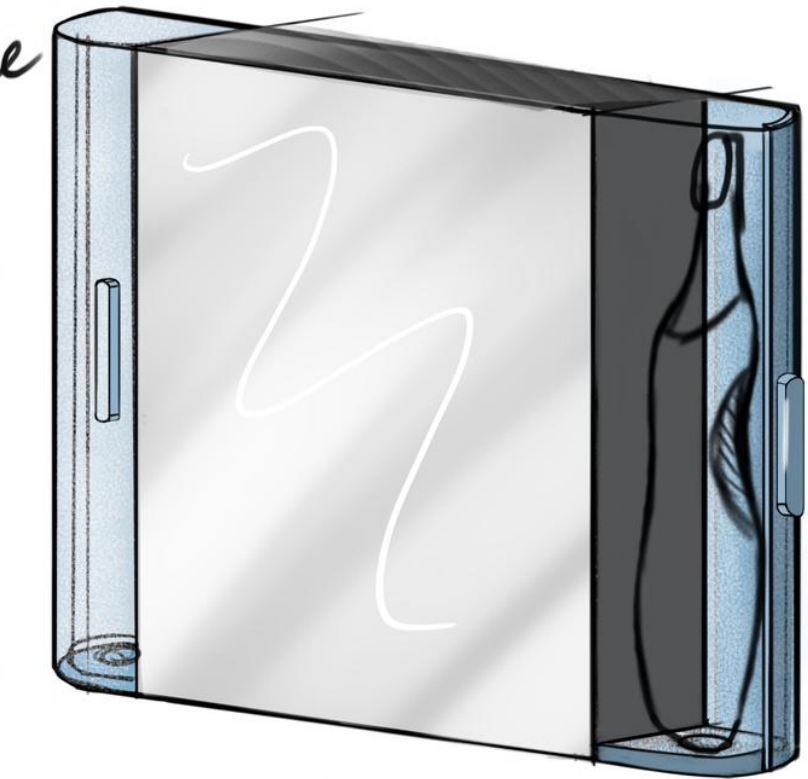
5



6



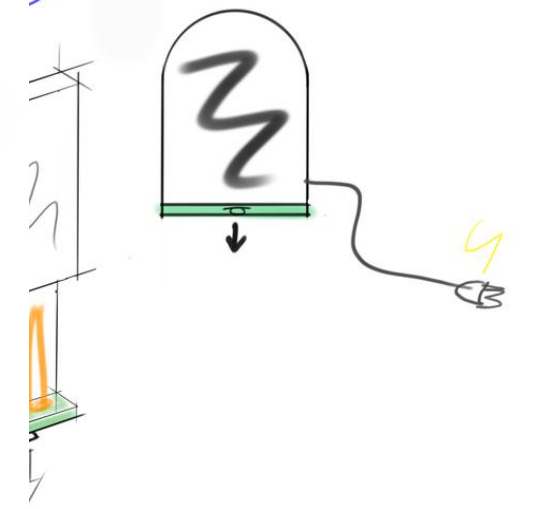
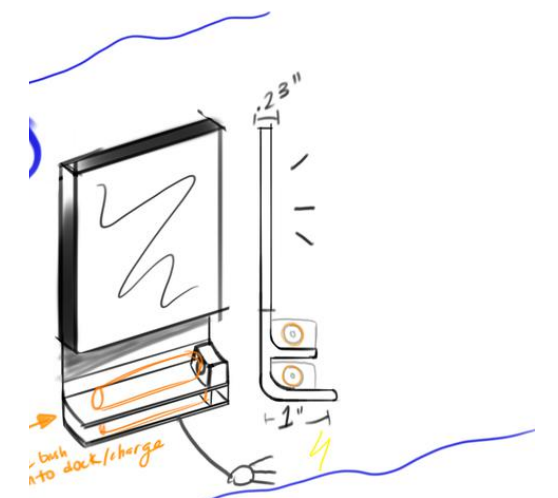
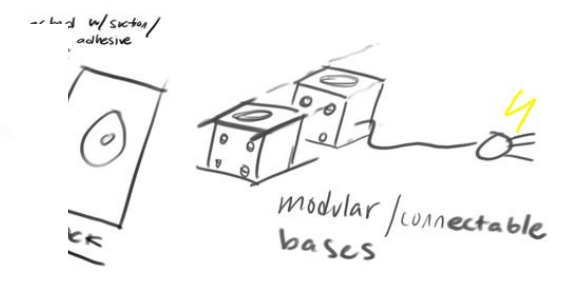
can only have 1

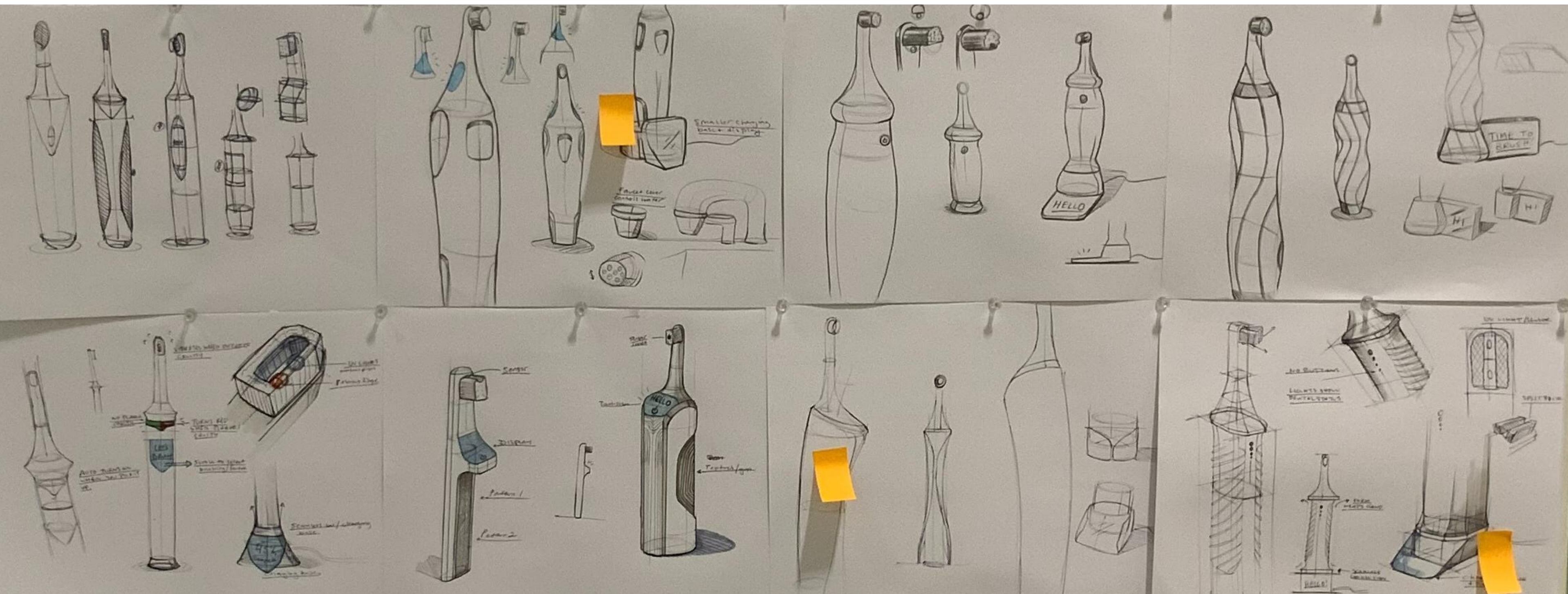


charging station



door opens acts as sanitary cover









I refined my concept sketches into more concentrated variations





UltraSight

The Electric Toothbrush that let's you see.



Design Language

Quarter 2



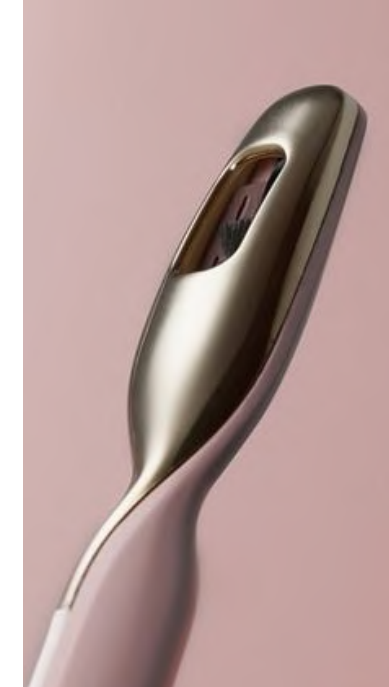
Your oral health journey is important to maintain and support.



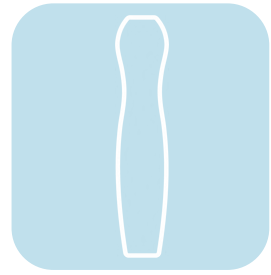
Using UltraSight is like that first exhale of relief after seeing your improving dental health.



That feeling when you think "I got this!"



SIGNATURE ELEMENTS



STATUESQUE FIGURE

Firm confidence and trust portrayed through soft geometry that supports the complex product.



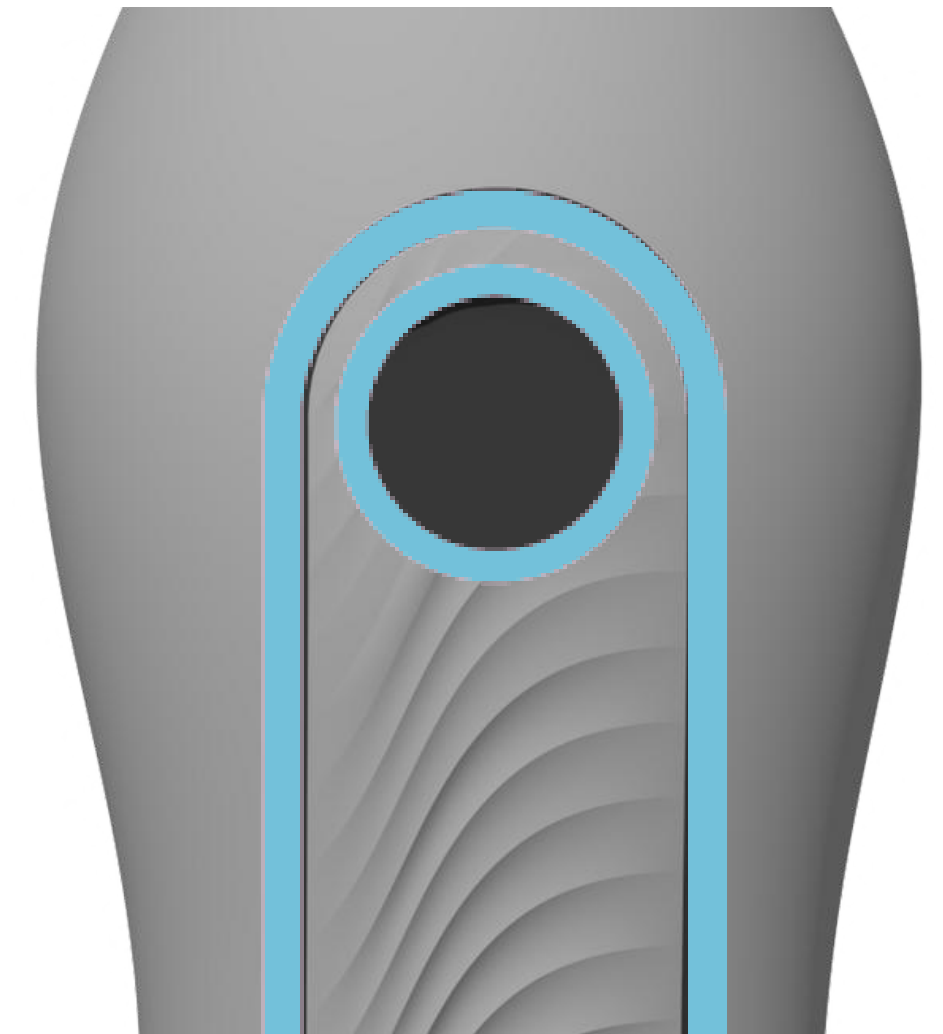
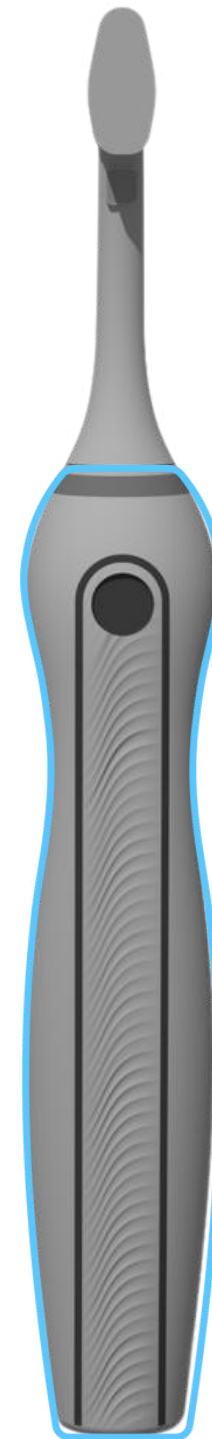
FLOWING TRANSITION

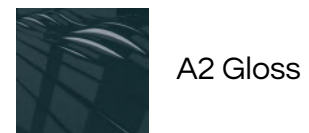
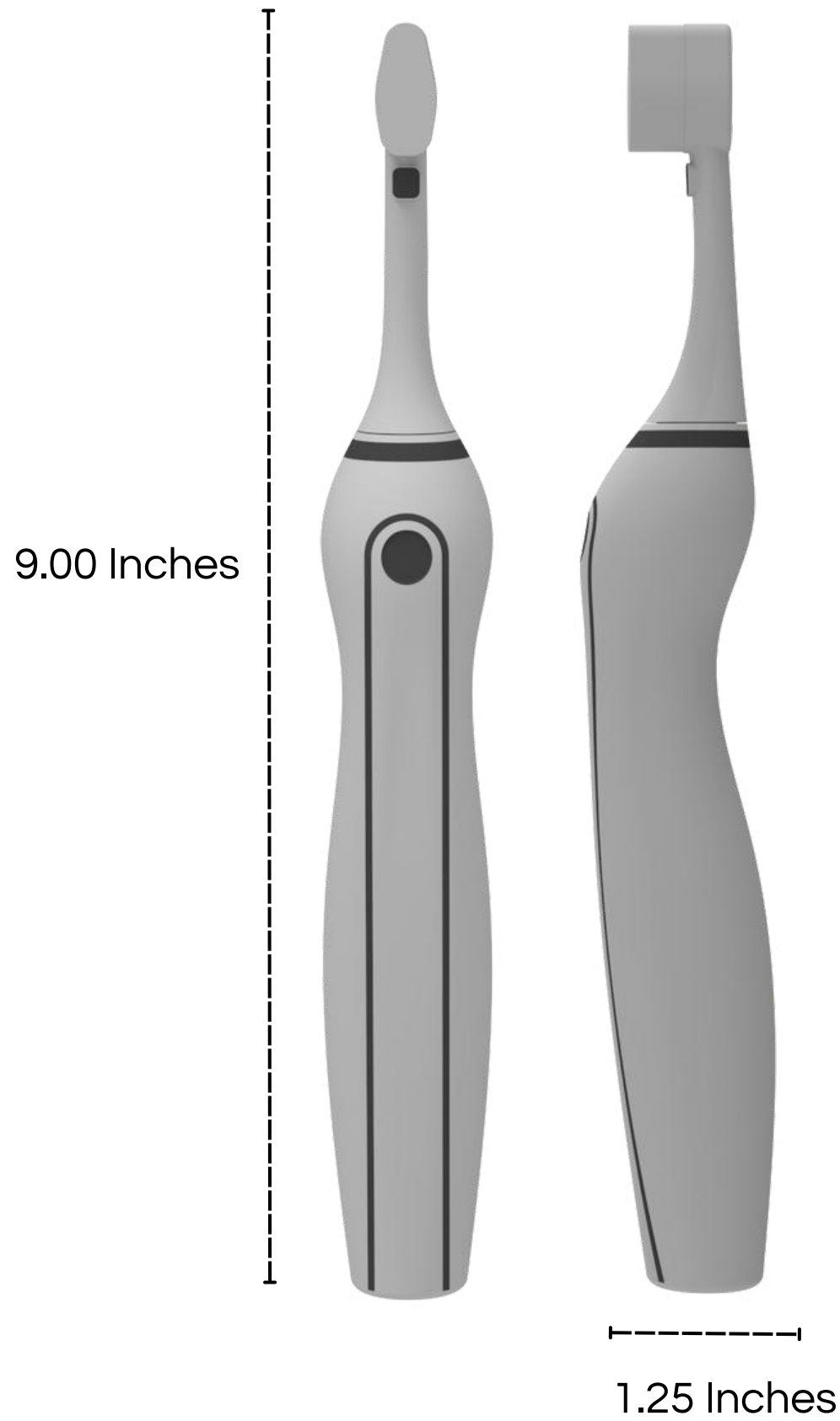
A simplistic and smooth surfacing symbolizes the path to better oral health with the help of UltraSight.



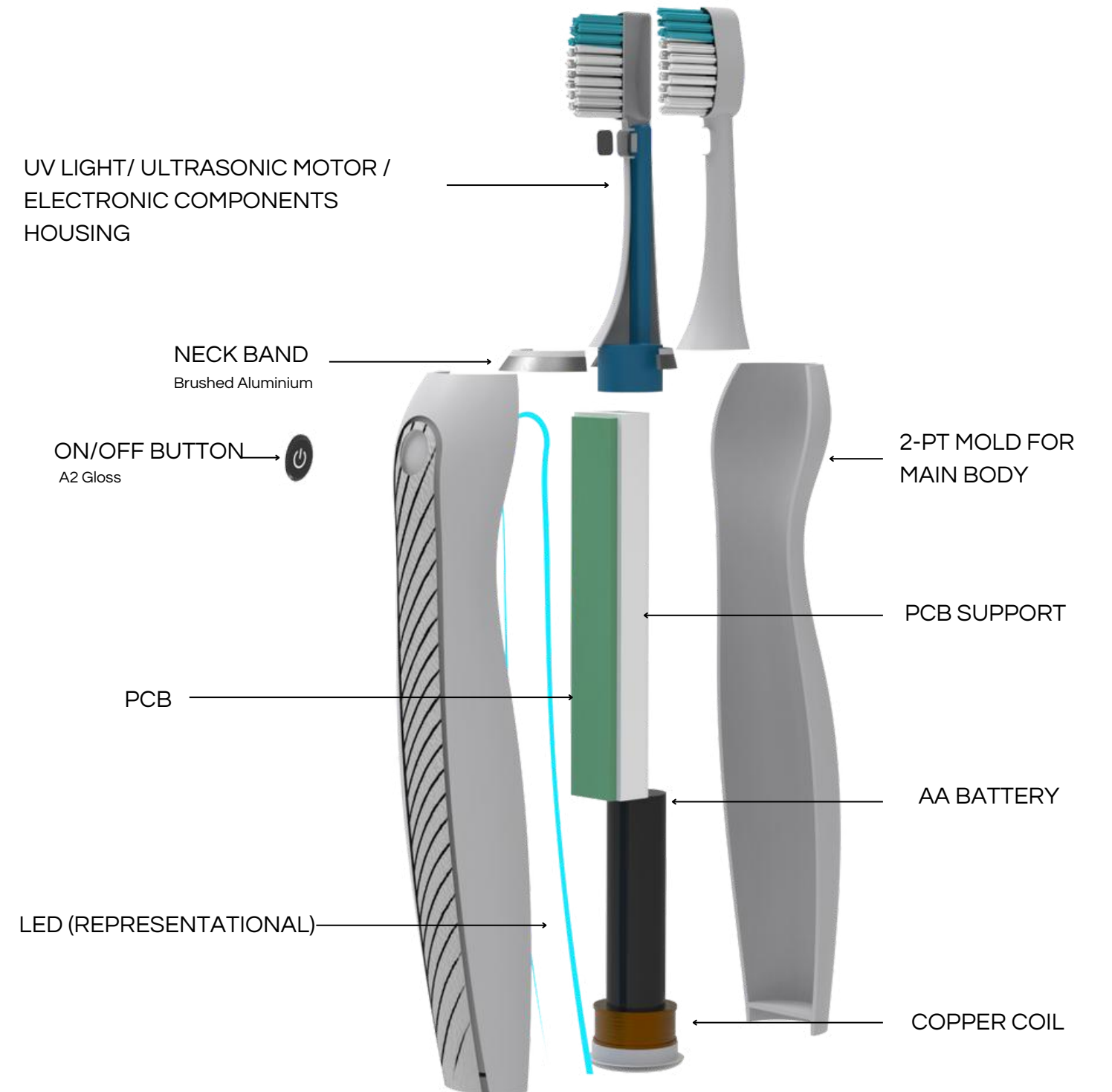
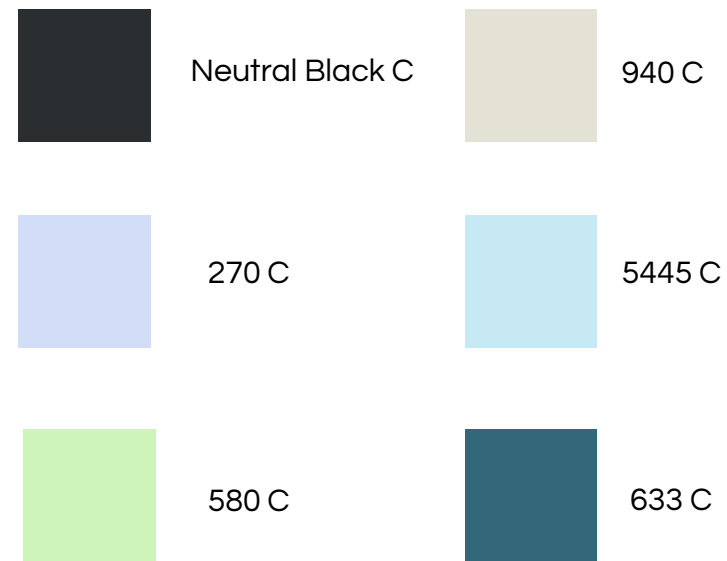
CLEAN INTERACTION

Simple geometric lines bring focus to the power button and toothbrush body.

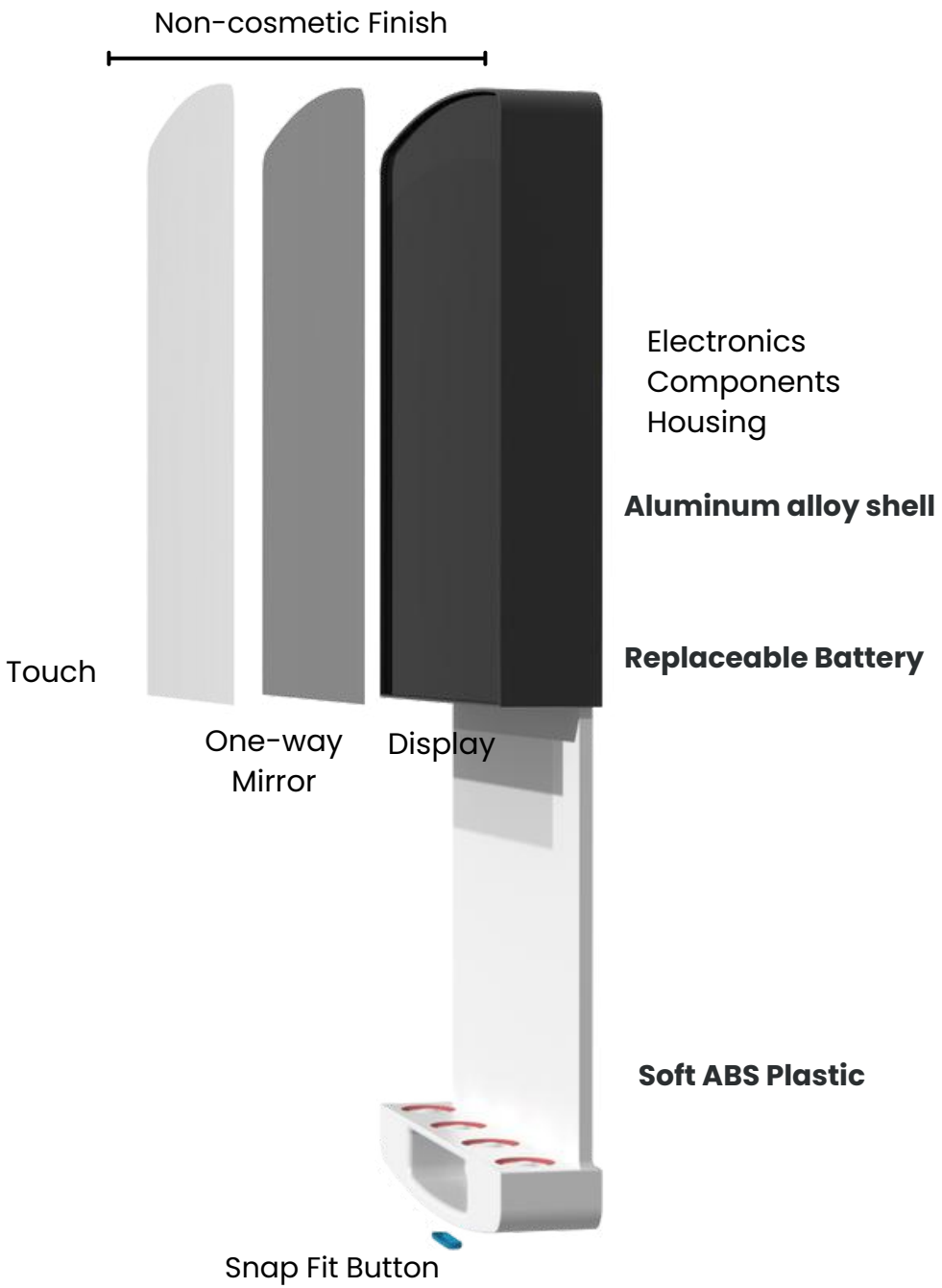
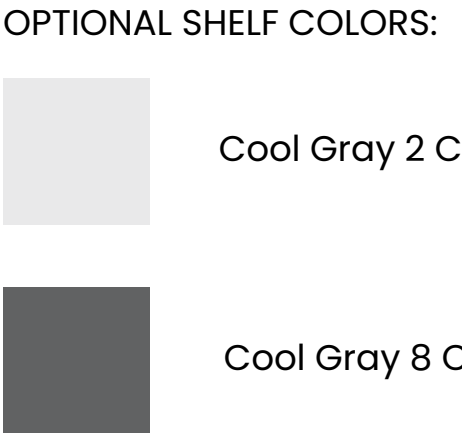
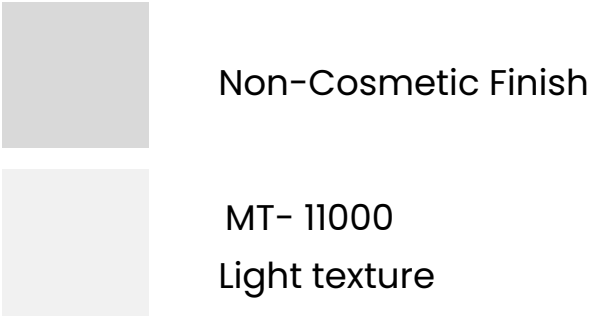
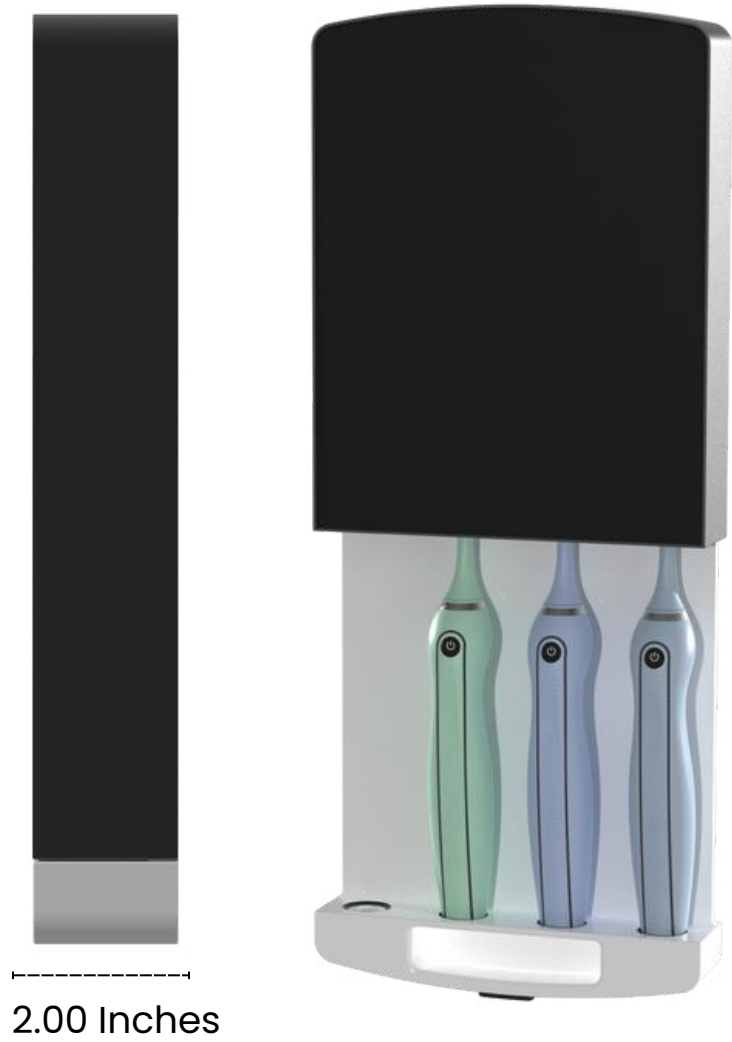
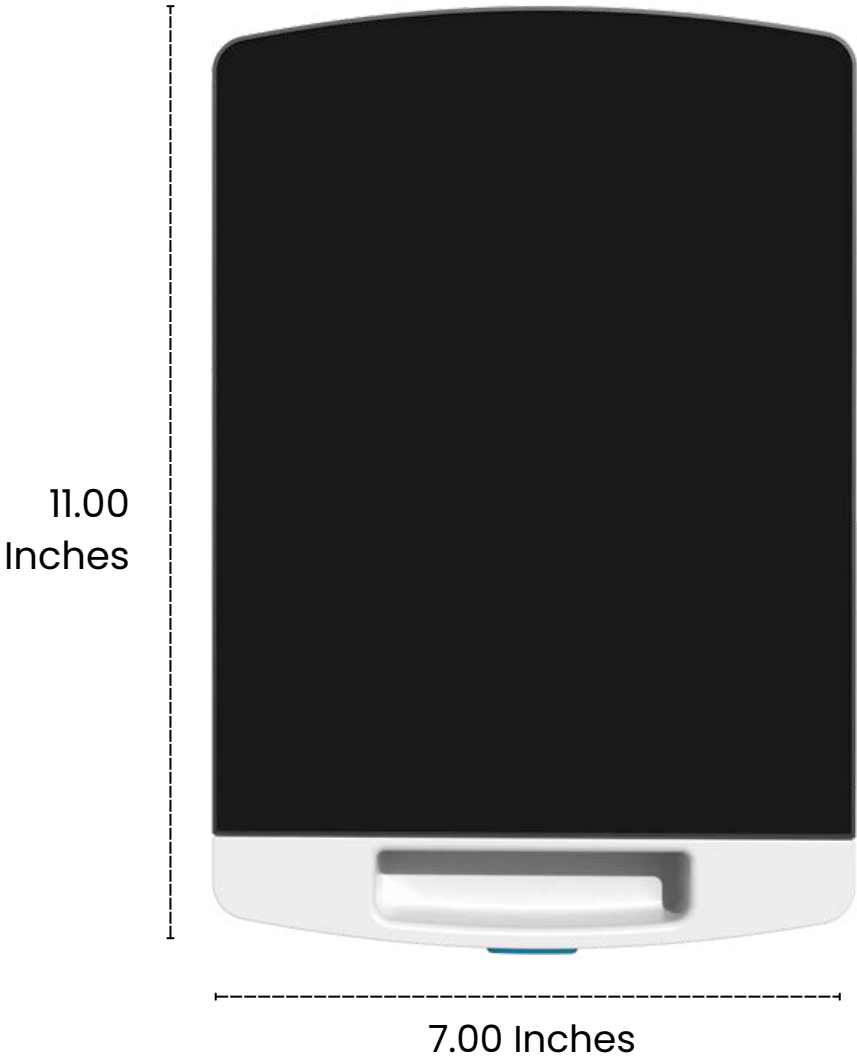




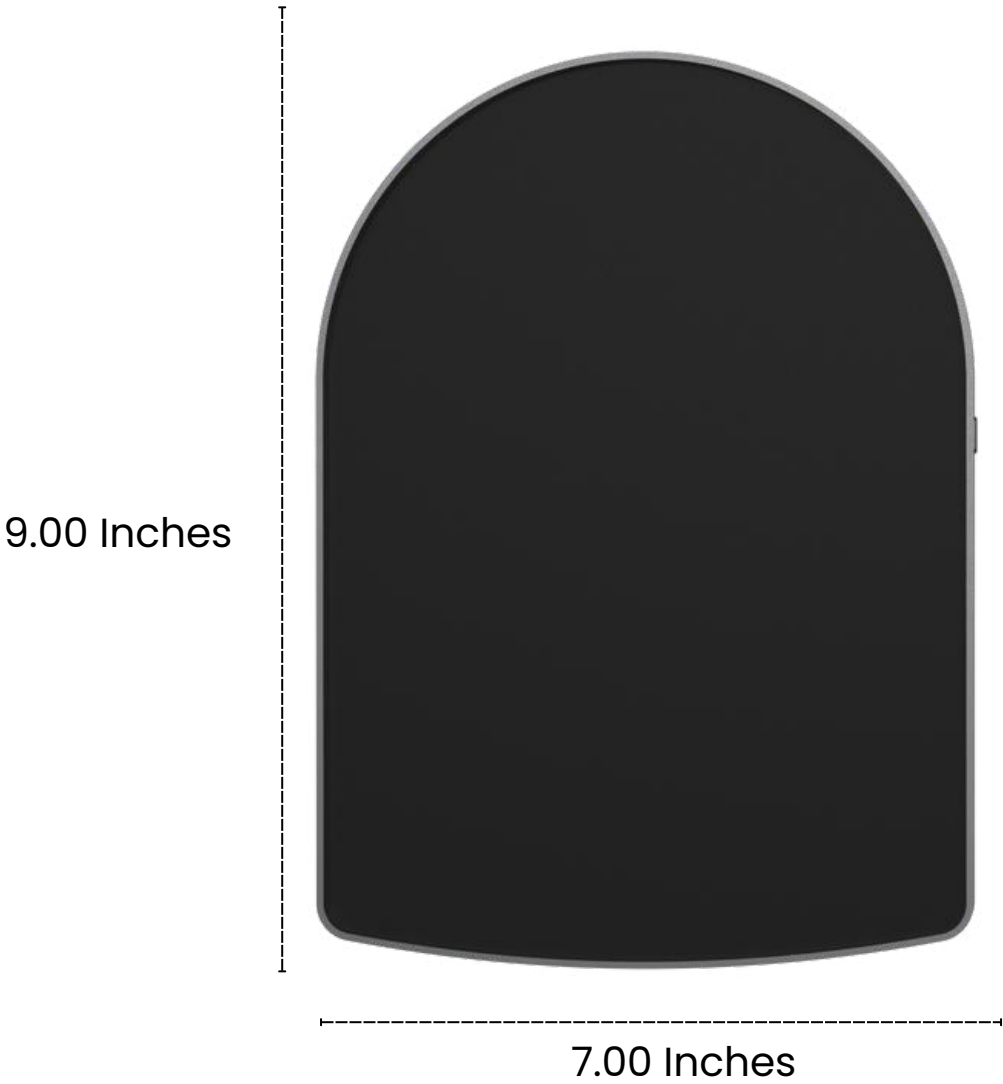
OPTIONAL TONAL COLORS:



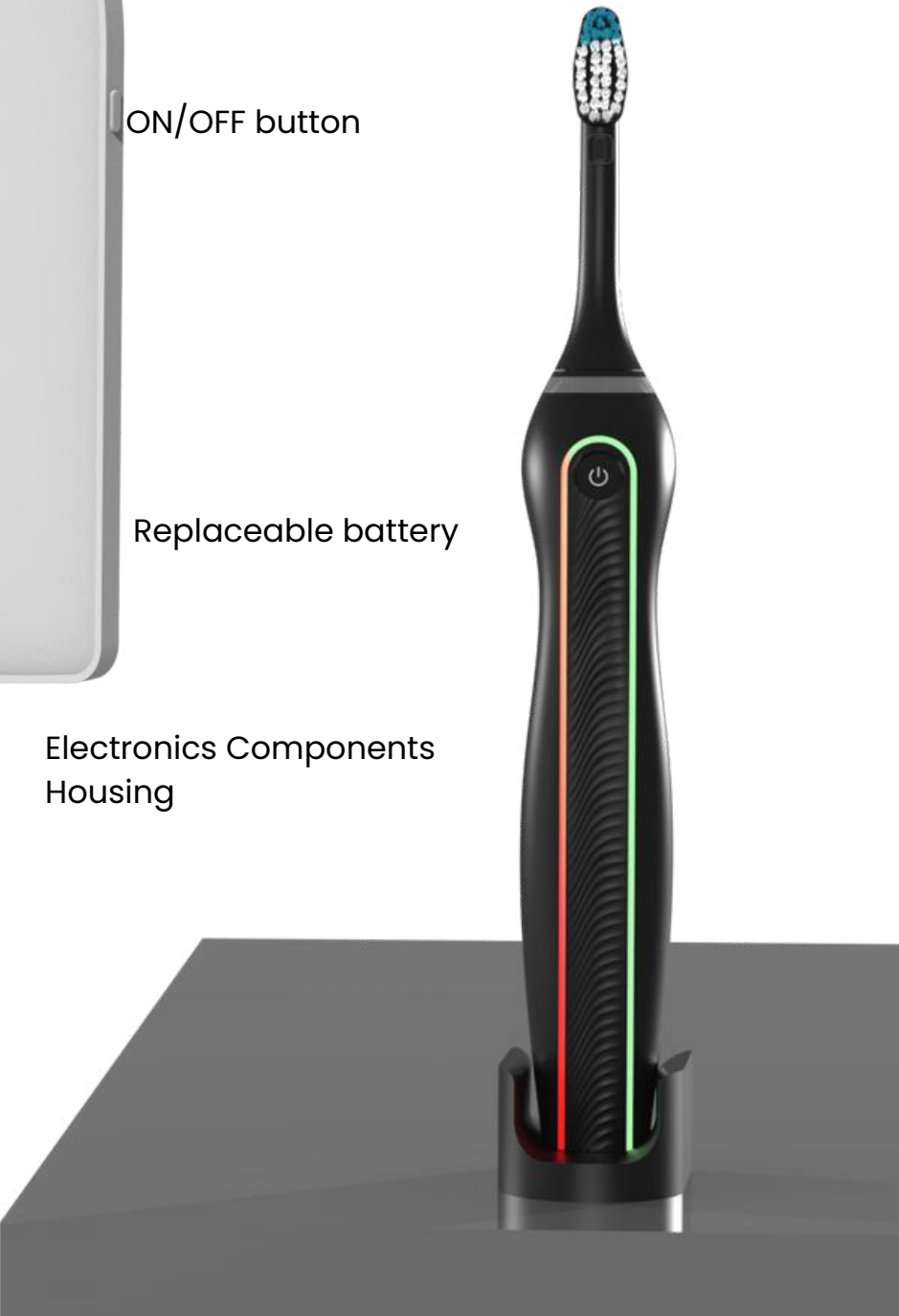
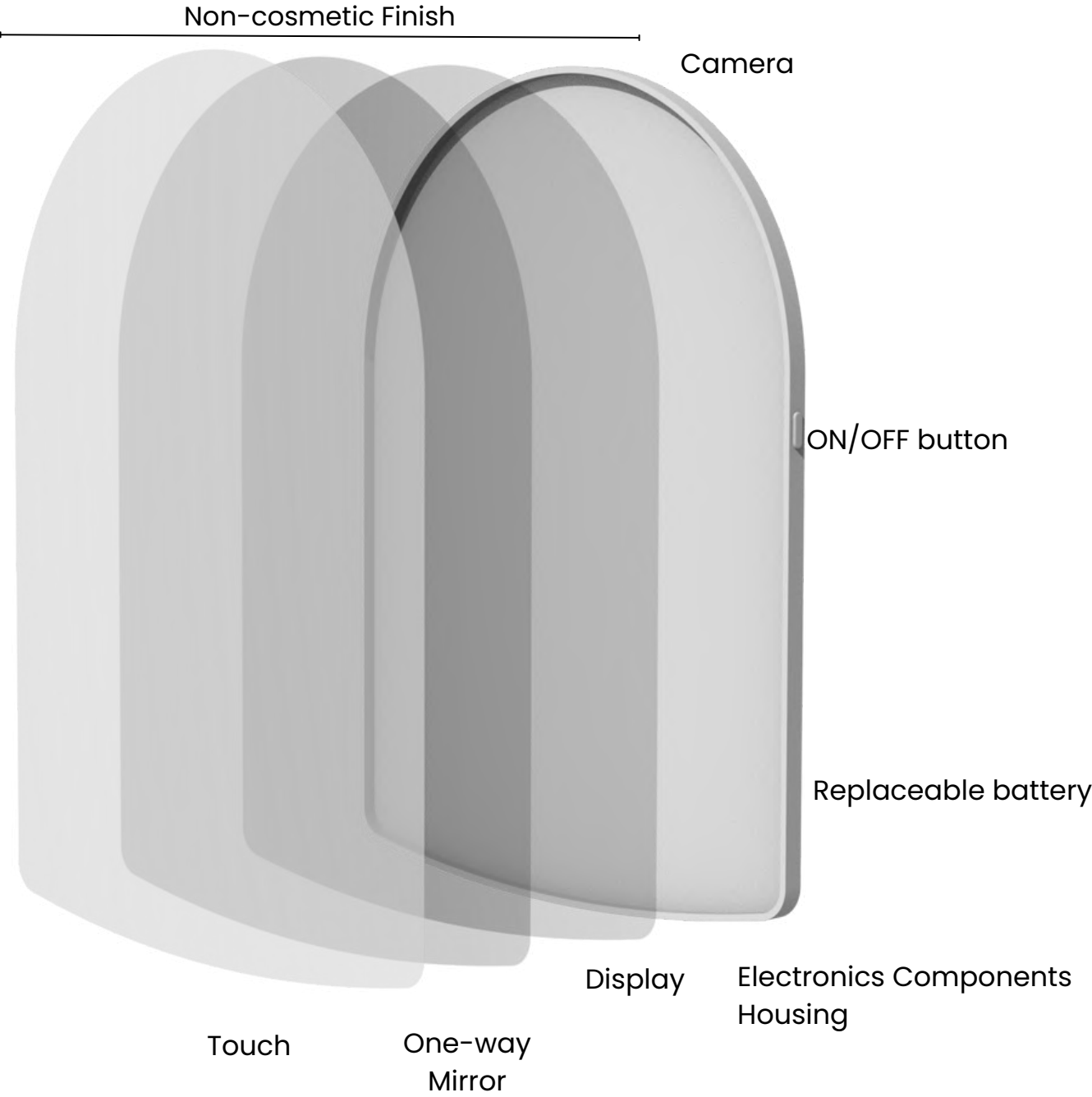
PULL DOWN SMART MIRROR

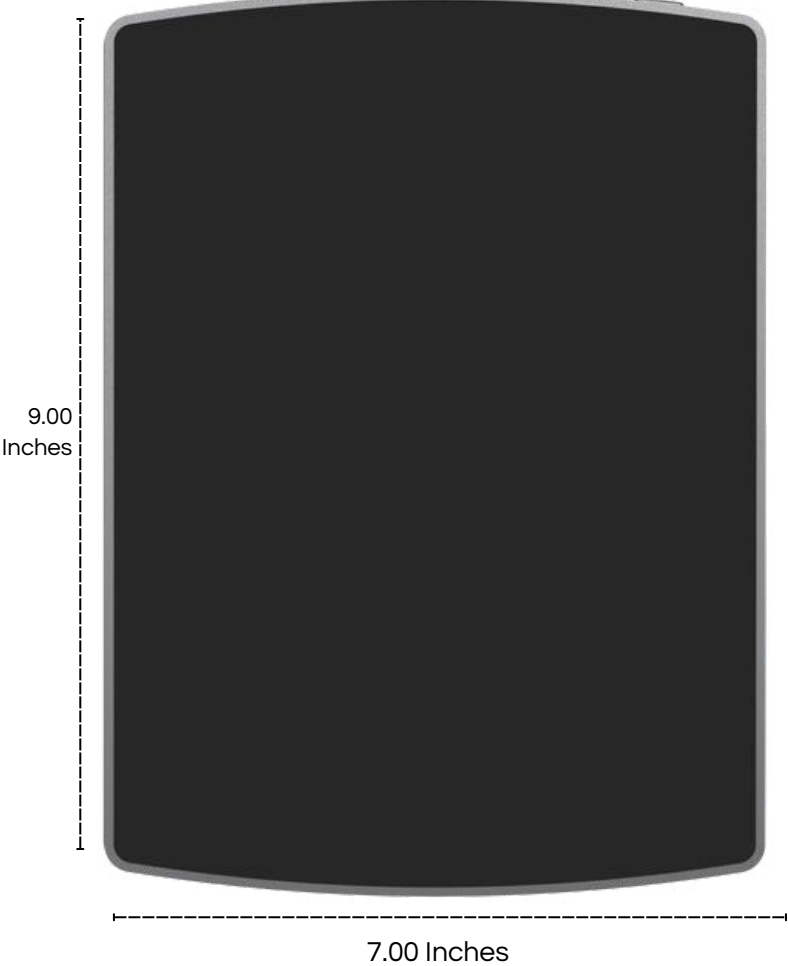


SIMPLE SMART MIRROR #1

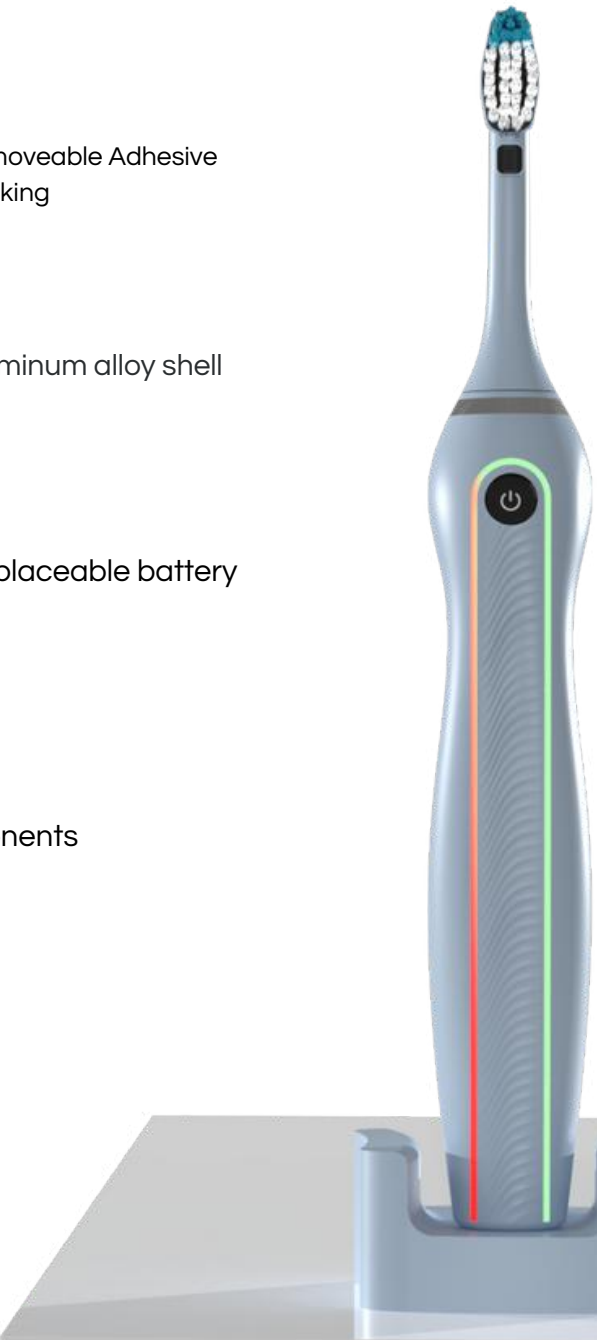
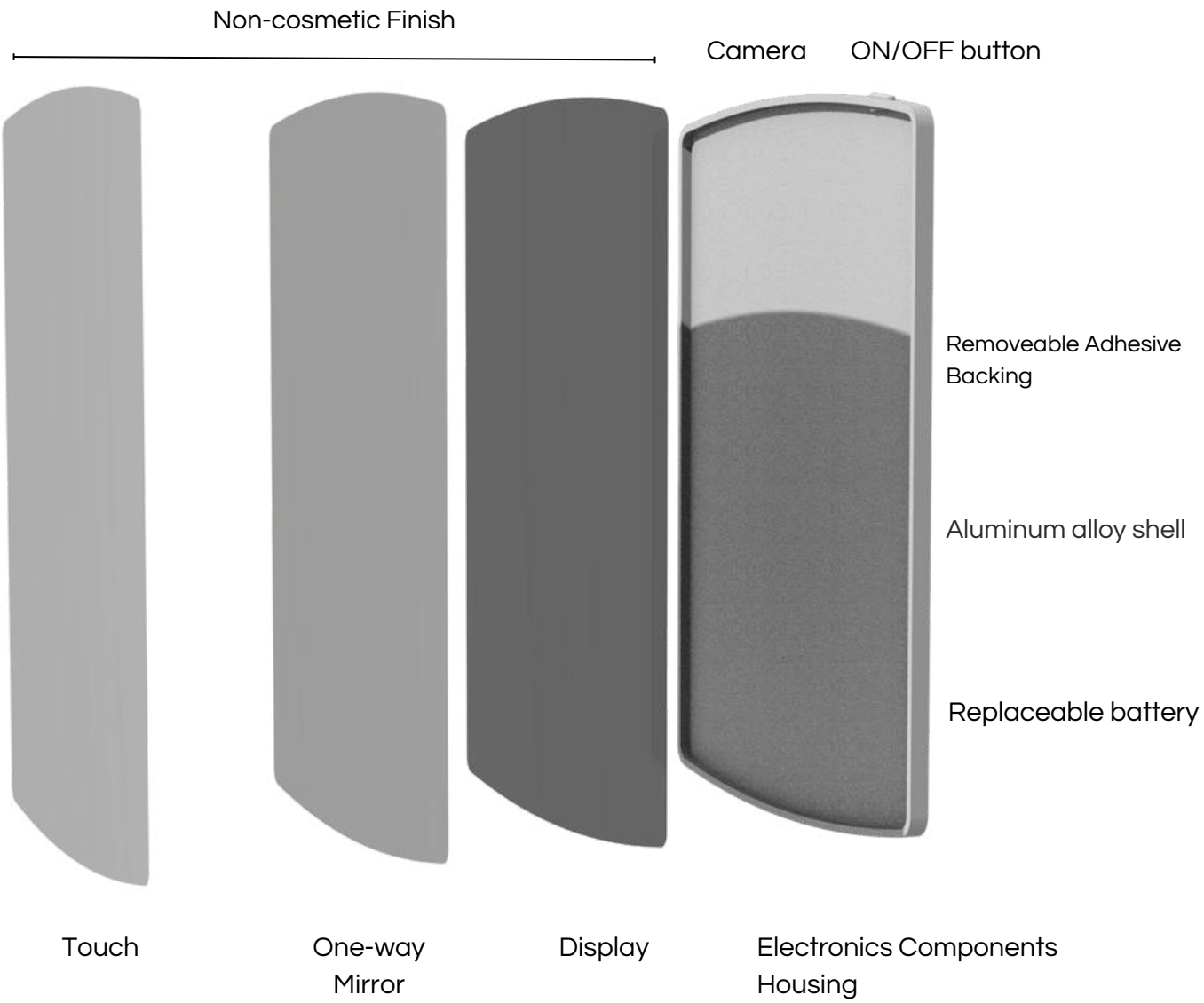


- MT- 11000
Aluminum alloy shell
Light texture
- Non-cosmetic Finish

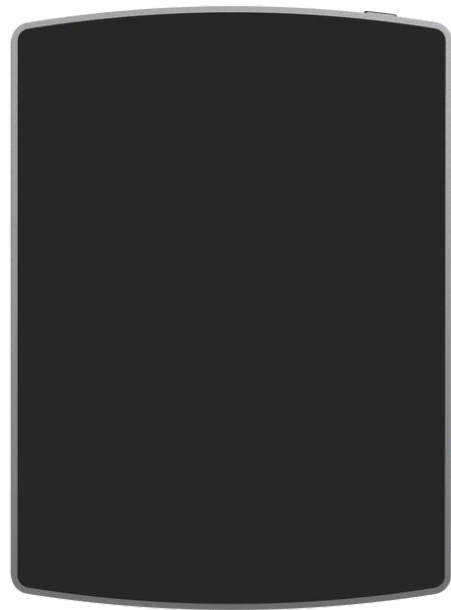




- MT- 11000
- Aluminum alloy shell
- Light texture
- Non-cosmetic Finish



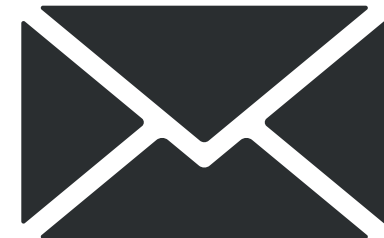
VALUE PROPOSITION



Detects plaque and cavities and shows through a real-time display.



Form language stands out from most electric toothbrushes.



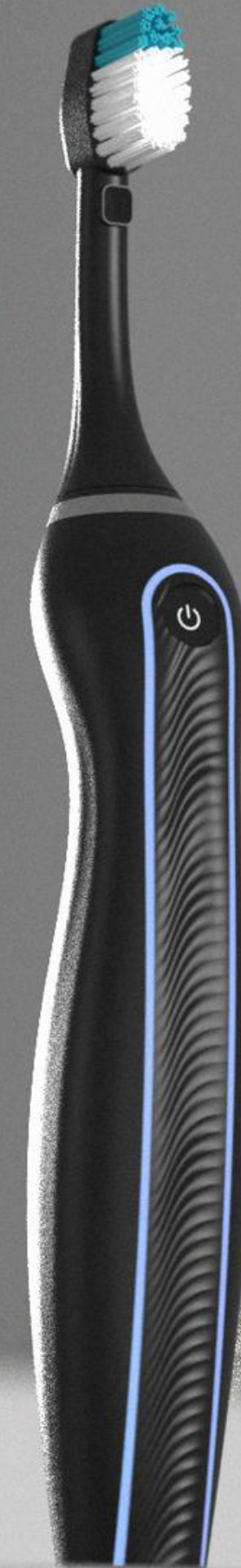
Supports user by sending information to the dentist and sending a tactile and visual feedback reaction.

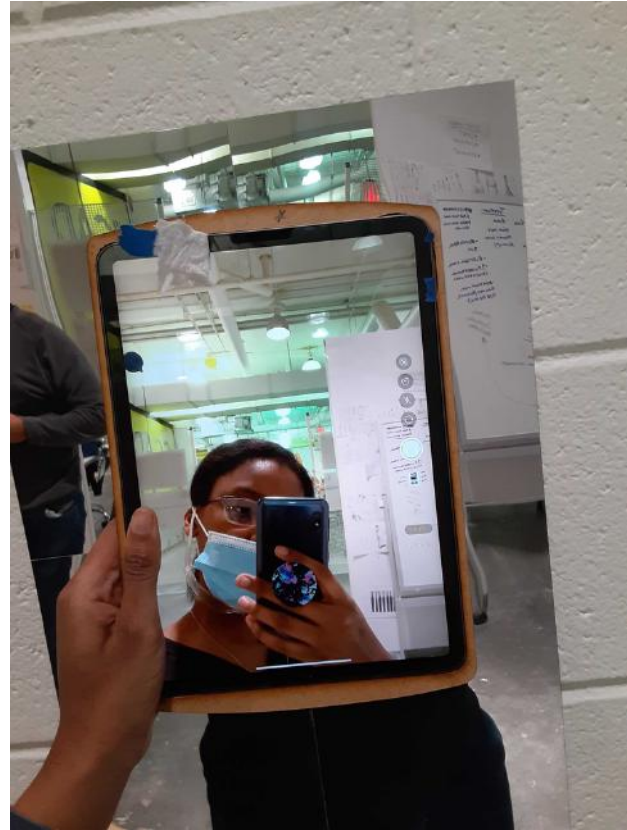
Final Concept & Images

Quarter 2

UltraSight

Ultrasonic electric toothbrush





I began with pink foam to prototype the form and how my iPad would be placed inside.

Then after measuring, I laser cut MDF to fit the iPad.

Finally, I spray-painted the MDF to resemble the metal of the Smart Mirror.



I 3D printed my Solidworks 3D model and began to sand and spray-paint it, and add bristles to resemble the final CMF.

In terms of how ergonomic it was, it was an immediate success on the first try, so I kept the form.

