



**Industrial Design
Centre
IIT-Bombay**

NEXT GENERATION DEVICE FOR BATHING EXPERIENCE

INDUSTRIAL DESIGN PROJECT II

Presented by-**Rajat**

Guided by-**Prof. Vijay Bapat**

Of Simons & Bathing

Mr & Mrs Simons

He is a general surgeons at Global hospital, Bangalore and she is a Deputy Bank manager at SBI Bangalore.

Married since last three years & are settled in Bangalore.

They are always with all their zeal and ambitious nature at work place.

Being very particular in nature, they always plans their day well to cope up with their work load.

They are particularly very attentive and cautious of their mental and physical well being in all busy walks of their life.

PERSONA

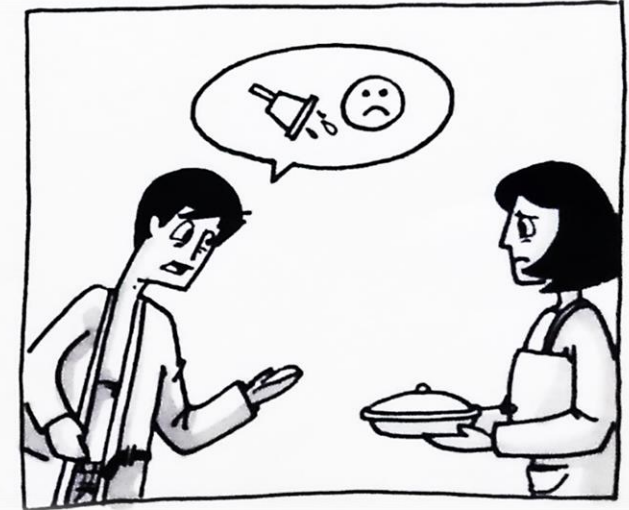




They leaves very early in the morning to reach work by time and are back to home late in the evening.



They being a conservative kind like to spend sometime under shower, draining all his tiredness and anxiety.



But they, being a choosy and demanding professionals, are not happy with their latest shower-head system they have at home.



They feel it has something missing and demands a lot of attention to interact with.
They expect that shower-head would understand & recognise them for their personal preferences and can work as one's body feels and the mind thinks.



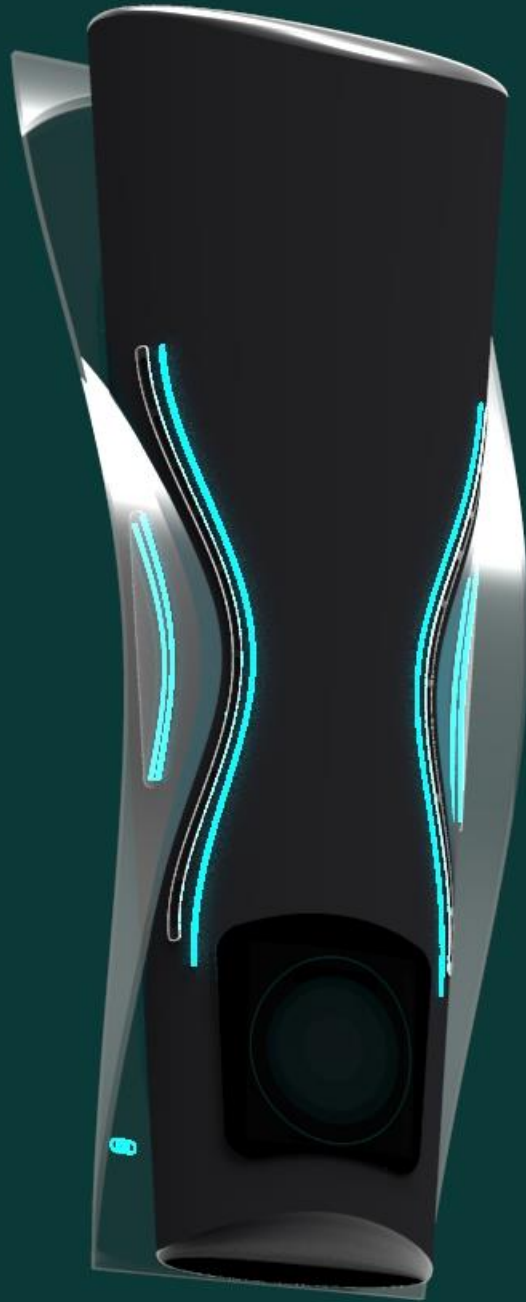
They do follow some of the best modern faucet design brands hoping to get something like they discussed of.

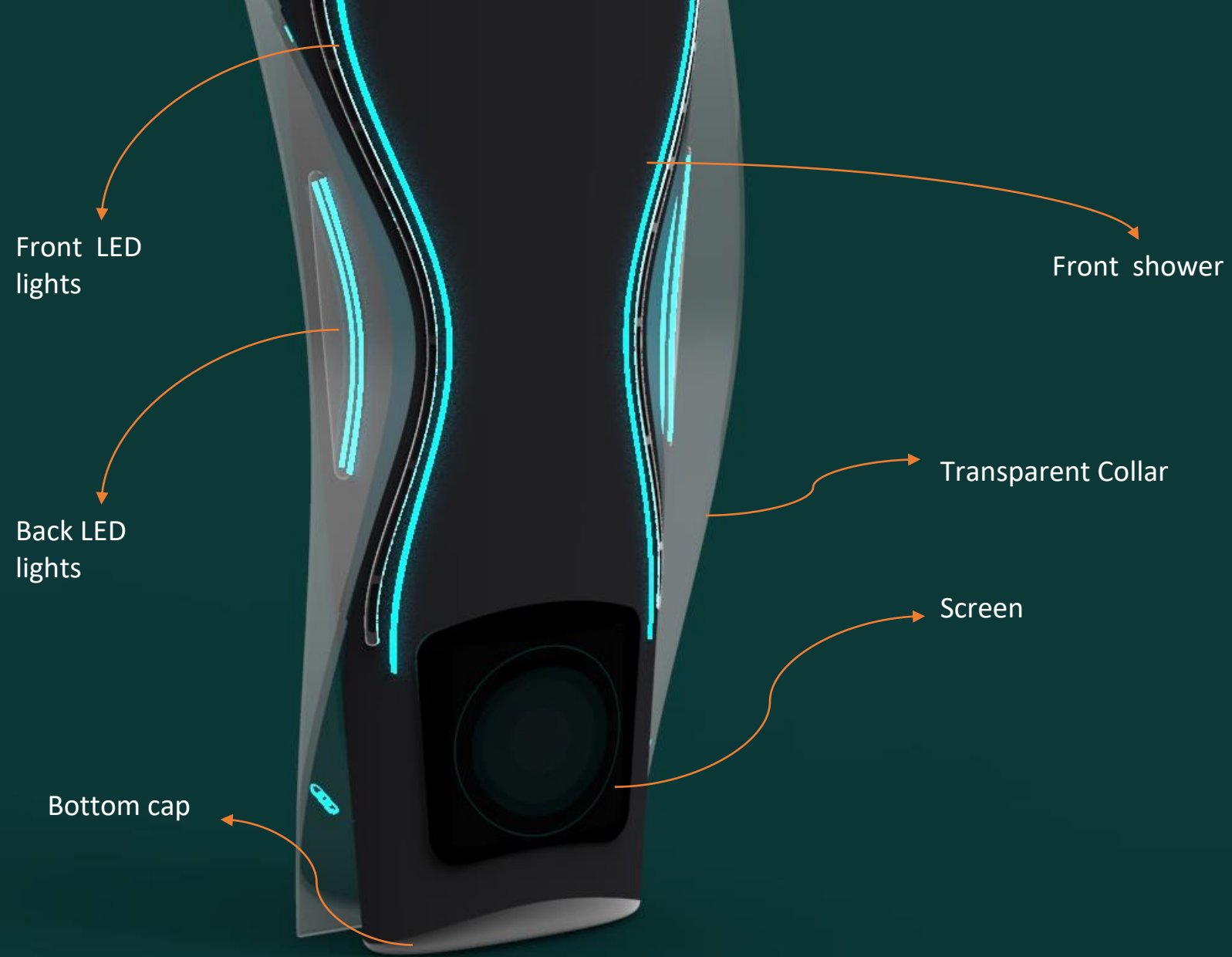
Something that may not require the remodelling of their bathroom but can be displayed out to appreciate the presence of their dream product for an all-over exhilarating experience !

One Sunday evening they found it..



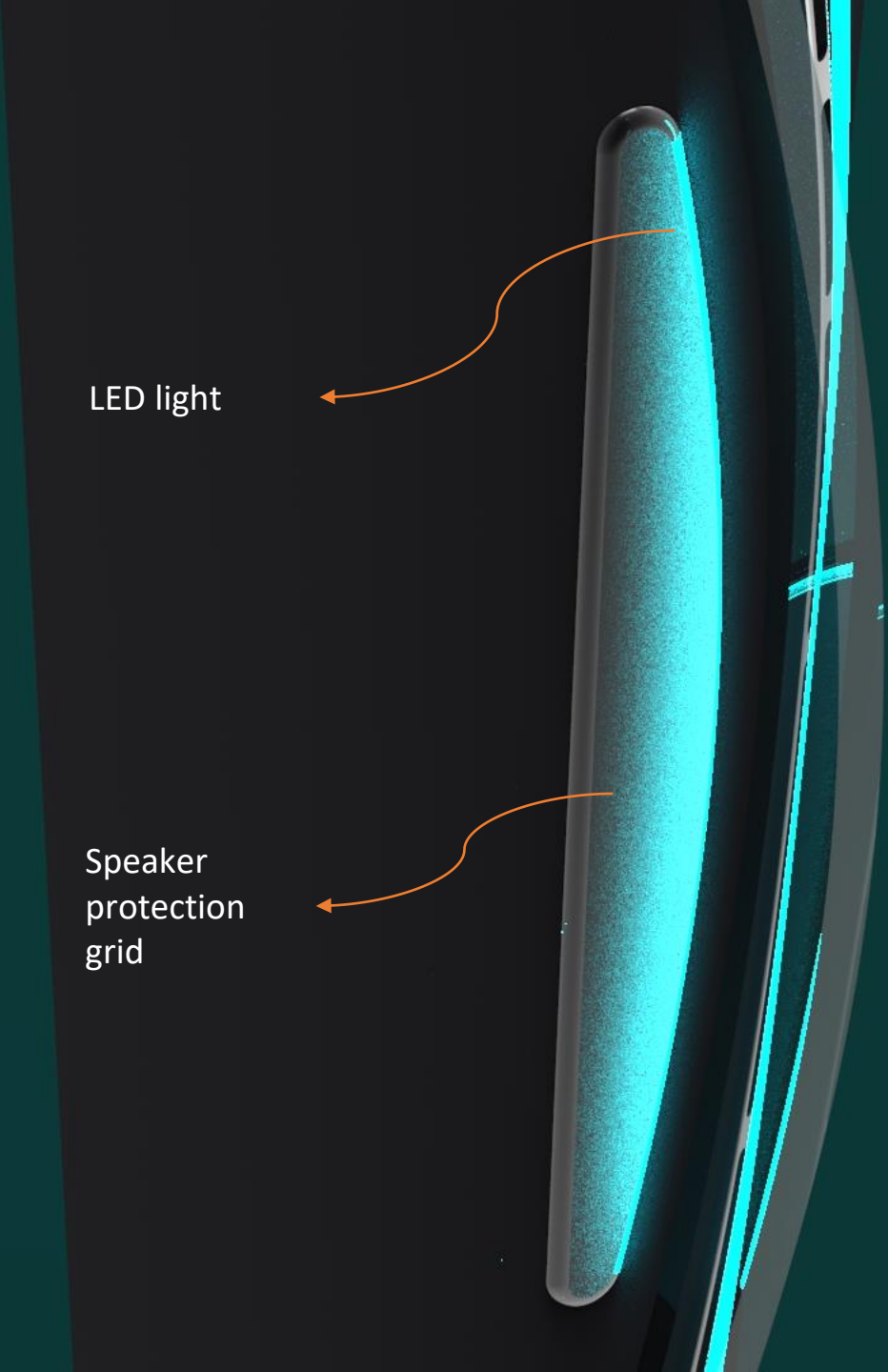
Nebula





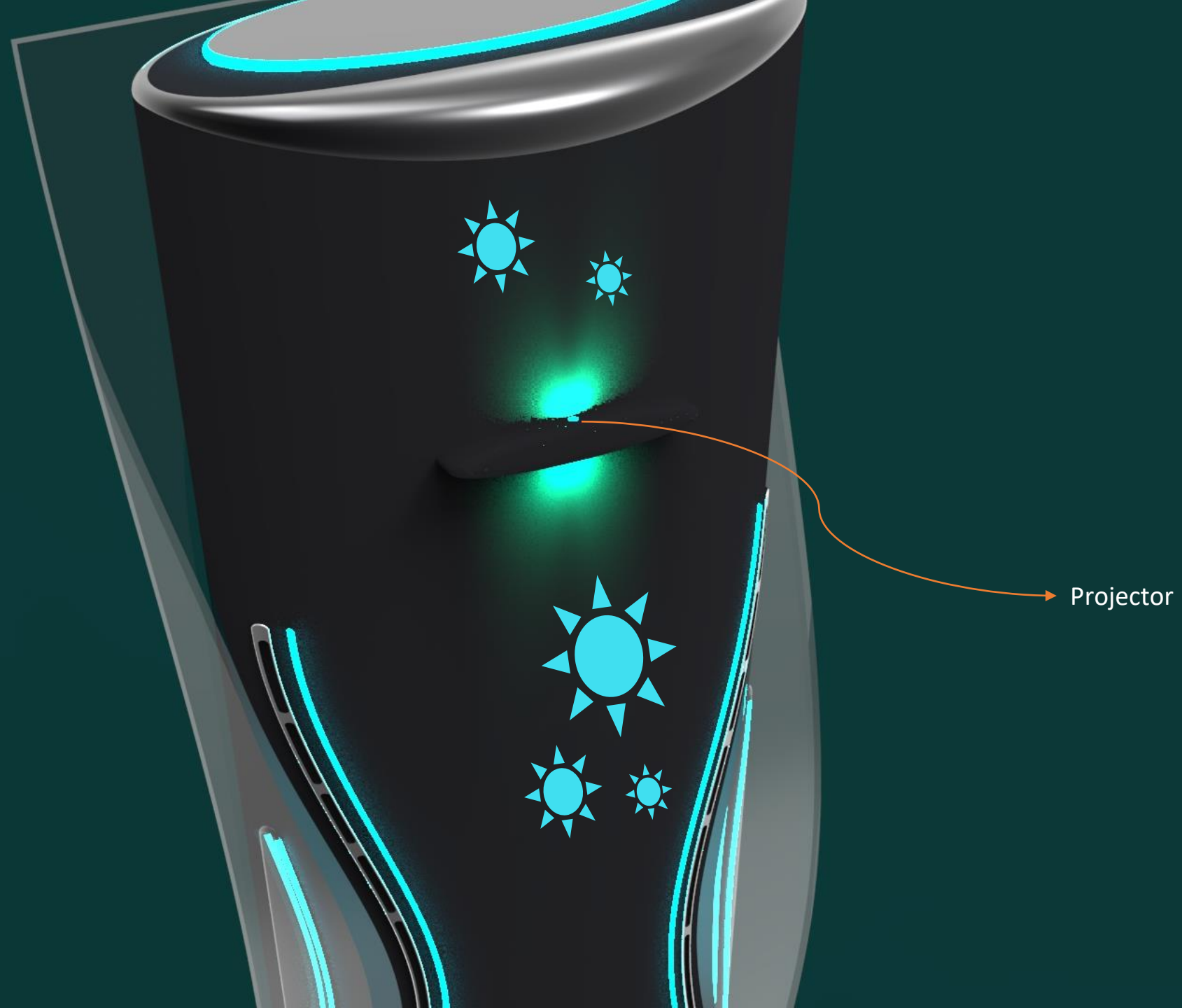


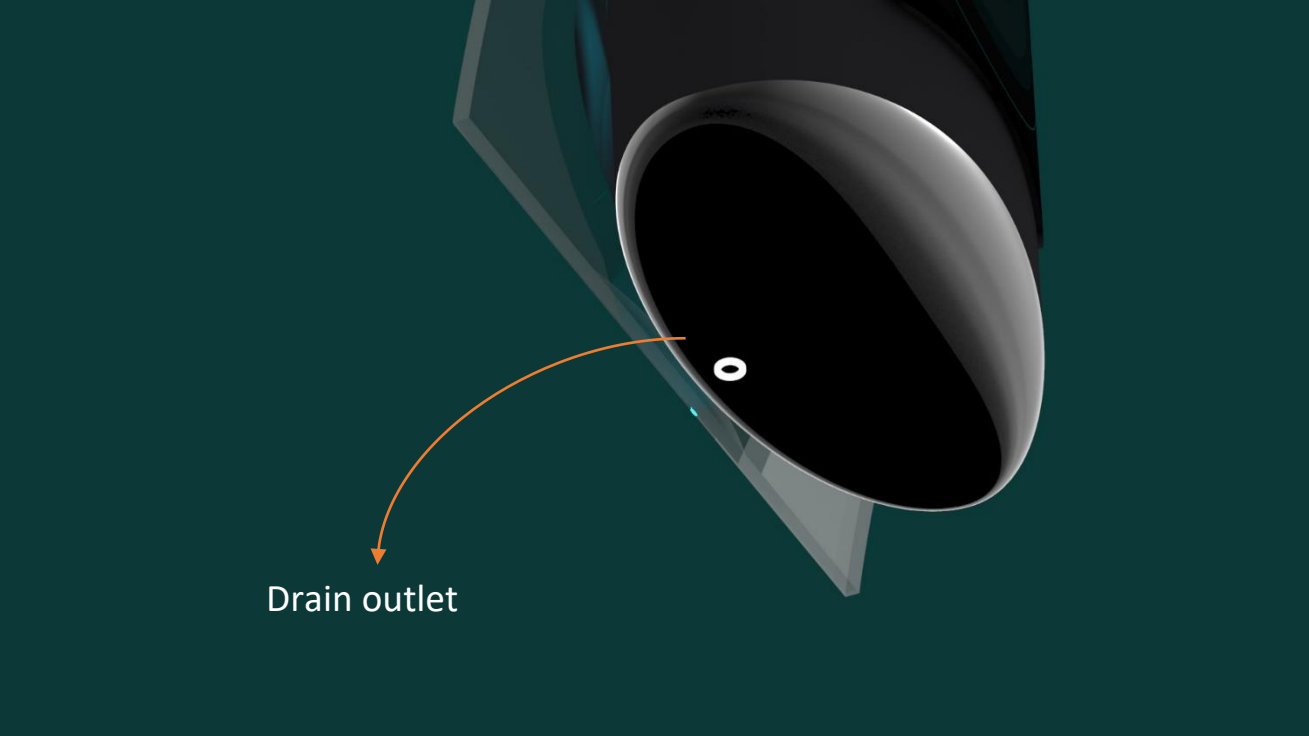
Aroma diffuser



LED light

Speaker
protection
grid

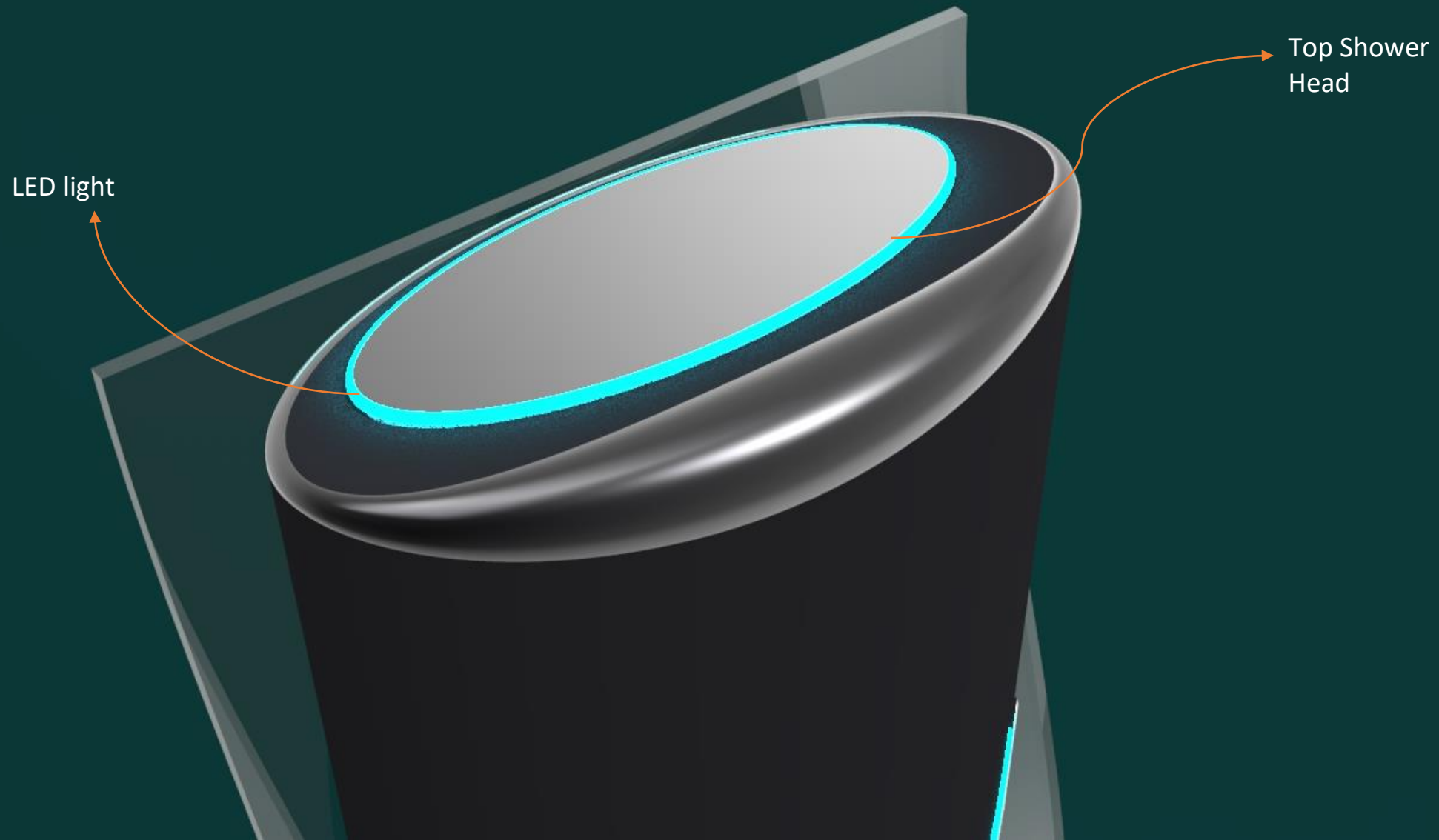




Drain outlet

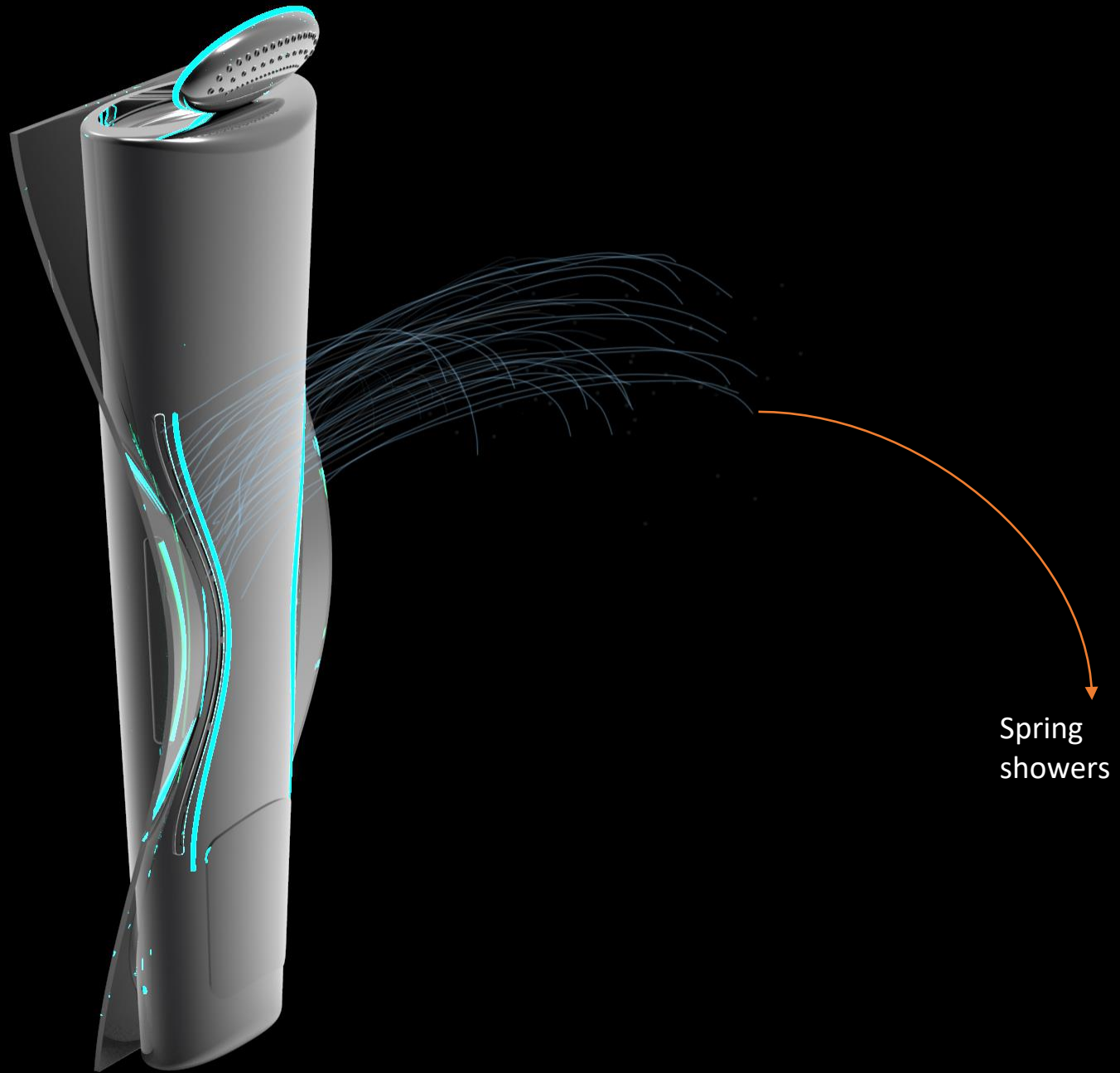


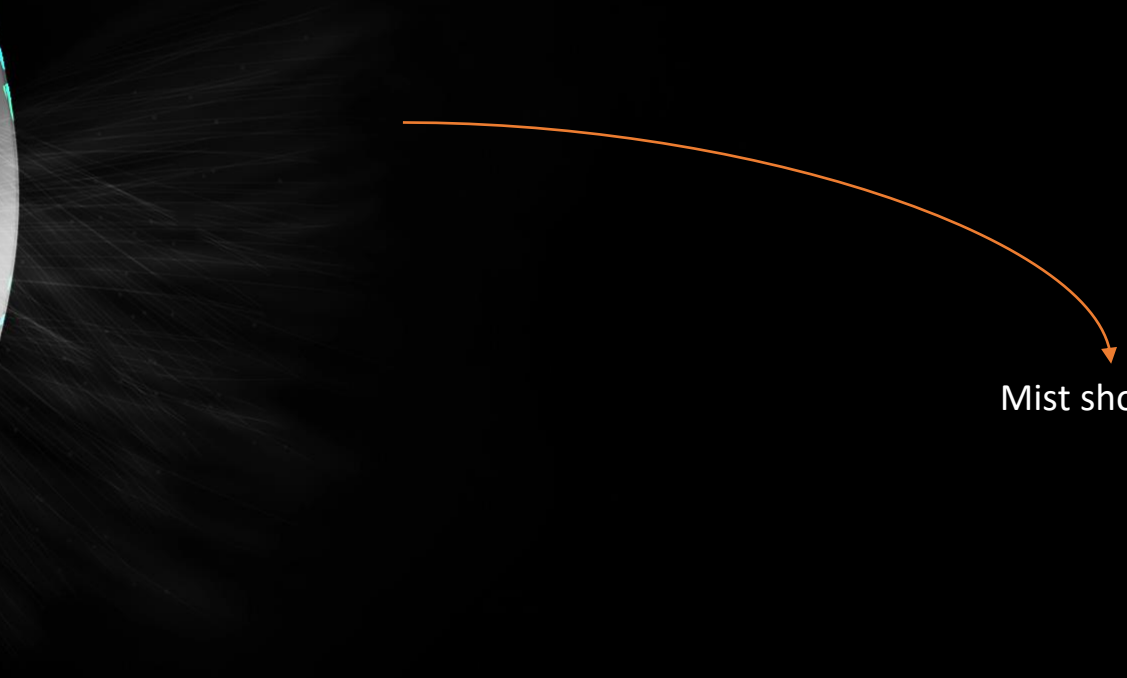
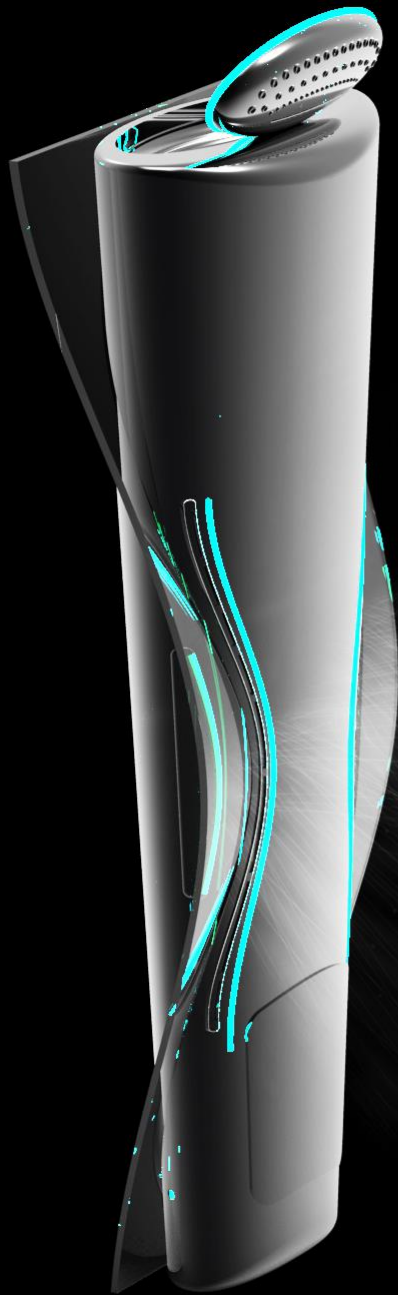
Inlet pipe
management
cavity



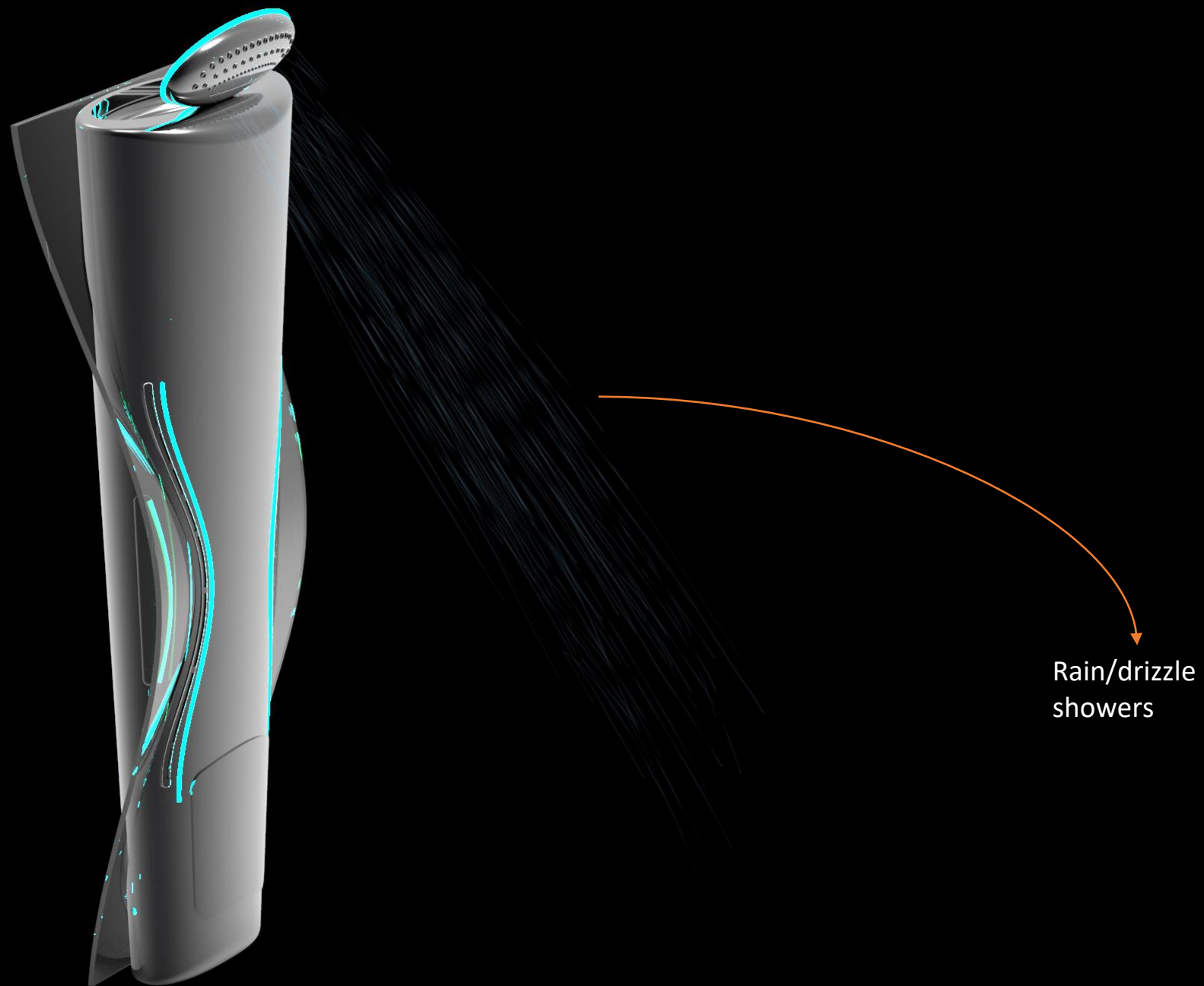
LED light

Top Shower
Head

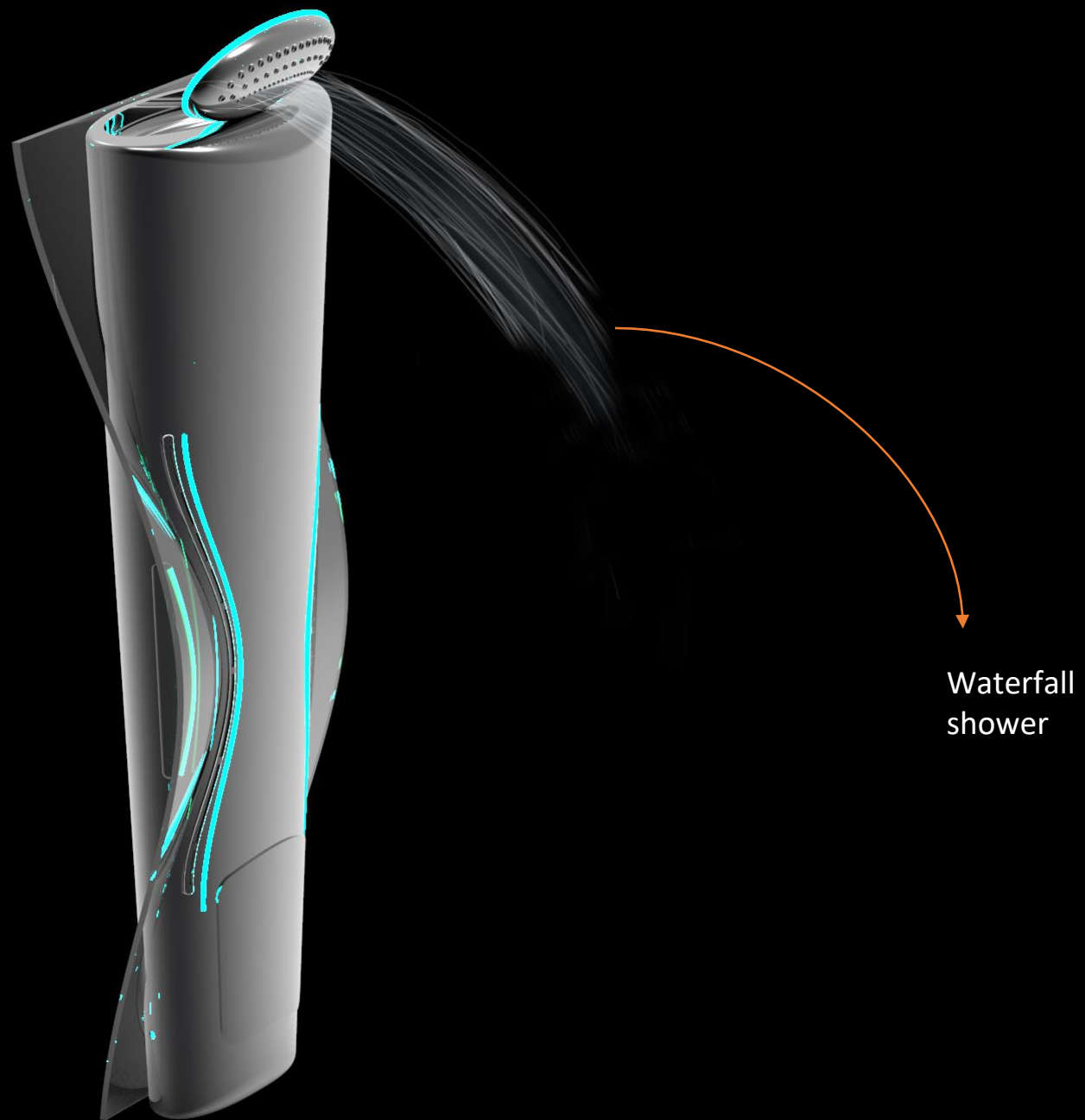




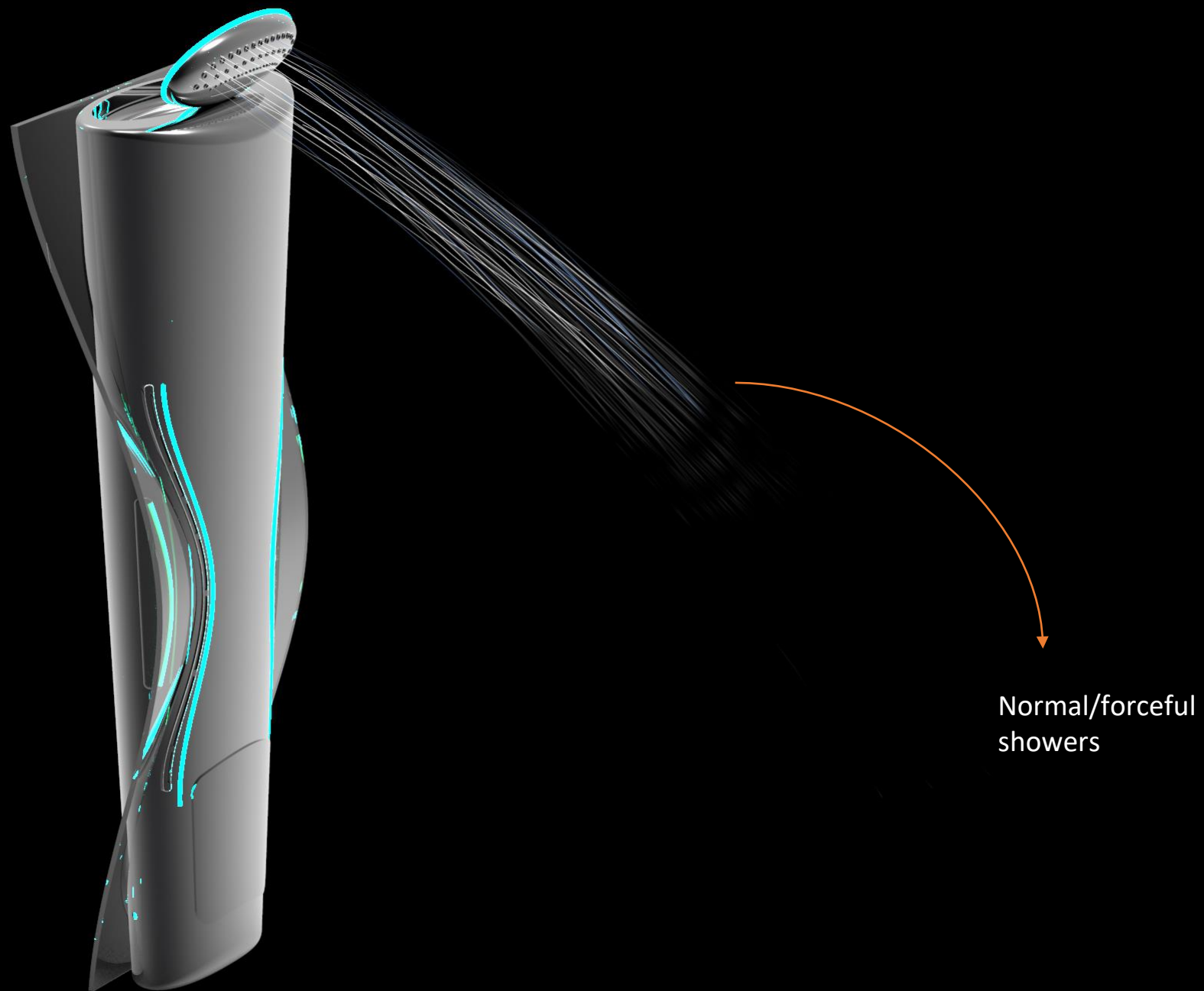
Mist showers



Rain/drizzle
showers

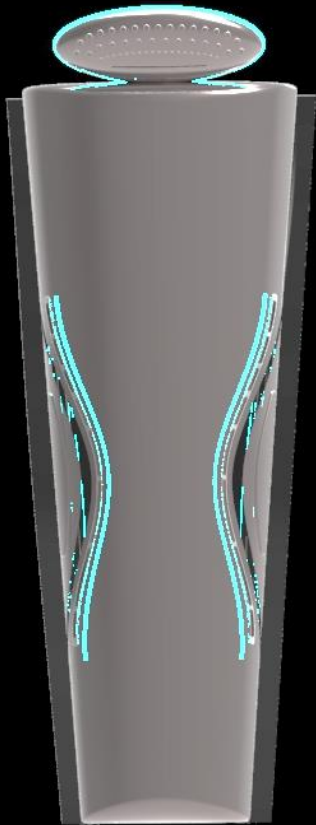


Waterfall
shower

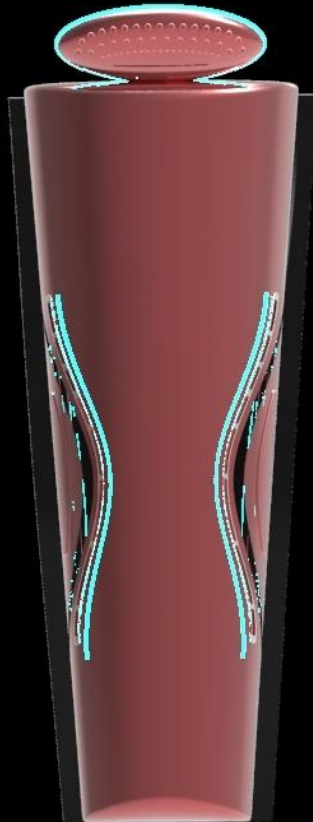


Normal/forceful
showers

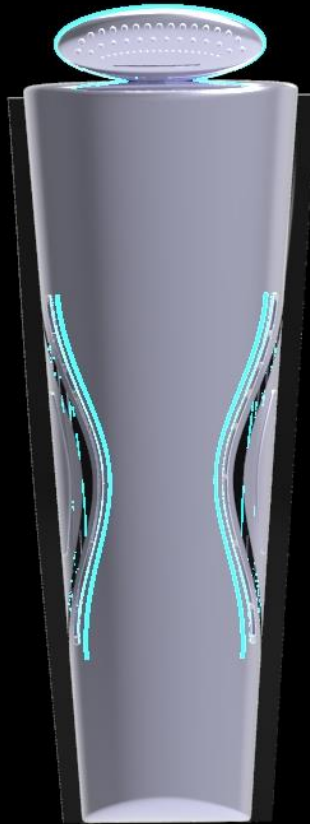
COLOR RANGES



White



Crimson



Silver



Brown

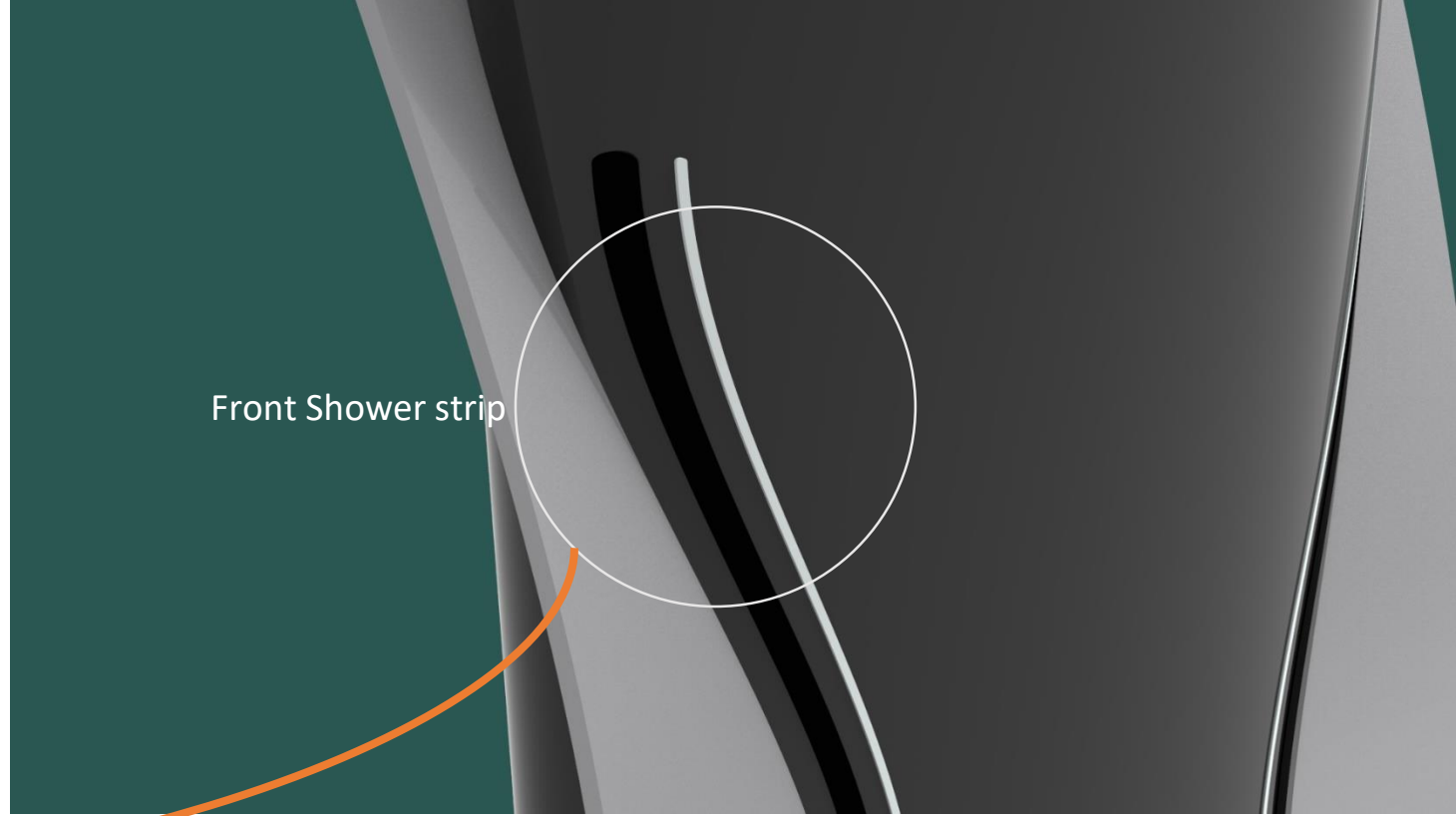
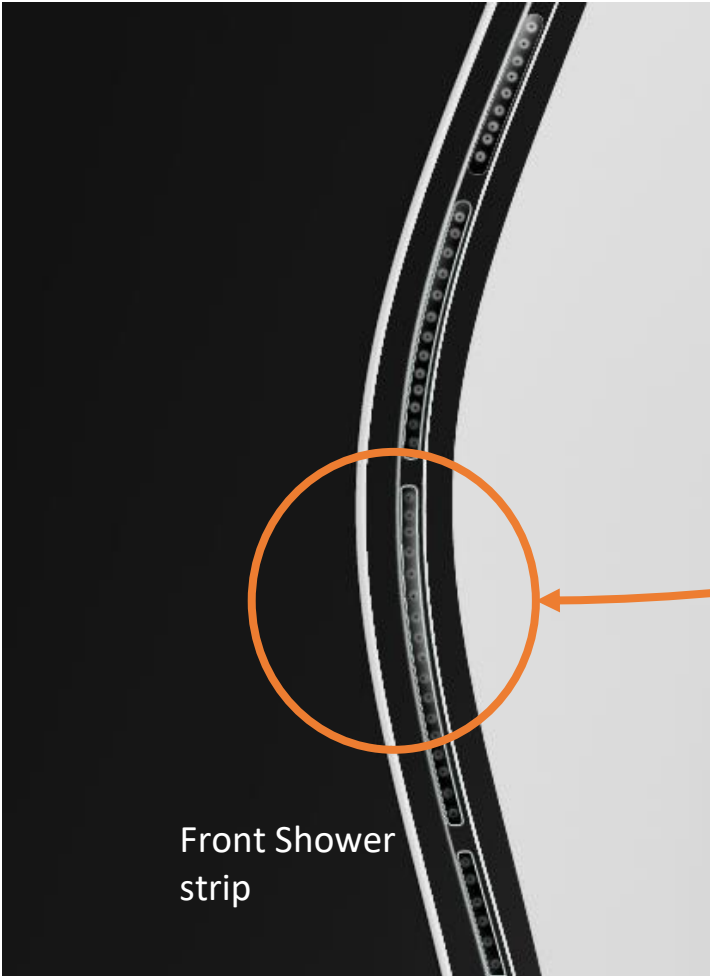


Black



DYNA





White & black

White

Black

Brown & black

Blue & black



COLOR RANGES



Product Interface































Bye!
See you in the Evening..





Water

One of the Sacred Five Elements in ancient Greek philosophy, in the Indian

Panchamahabhuta,

and in the Chinese cosmological and physiological system

Resembles the qualities of **Emotion, Pleasure, Playfulness & Intuition**

in contemporary esoteric traditions

Considered as the **Healer**

Of Bathing And Water

Dates back to 2000 BC



FIGURE - THE EGYPTIAN BATH

<https://www.thebathtubdiva.com/history-of-bath-tubs-bathing-part-3/> dated 29/10/2018

Bathing In Greek And Roman Times

Bating as

Recreational Activity

Bathing facility as

Elaborate Structures

Varied In Size, Arrangement, & Decoration

Gradually Exposing Difference Temperatures



FIGURE- BATHS OF TRAJAN, 104

www.crystalinks.com/romebaths.html dated 29/10/2018

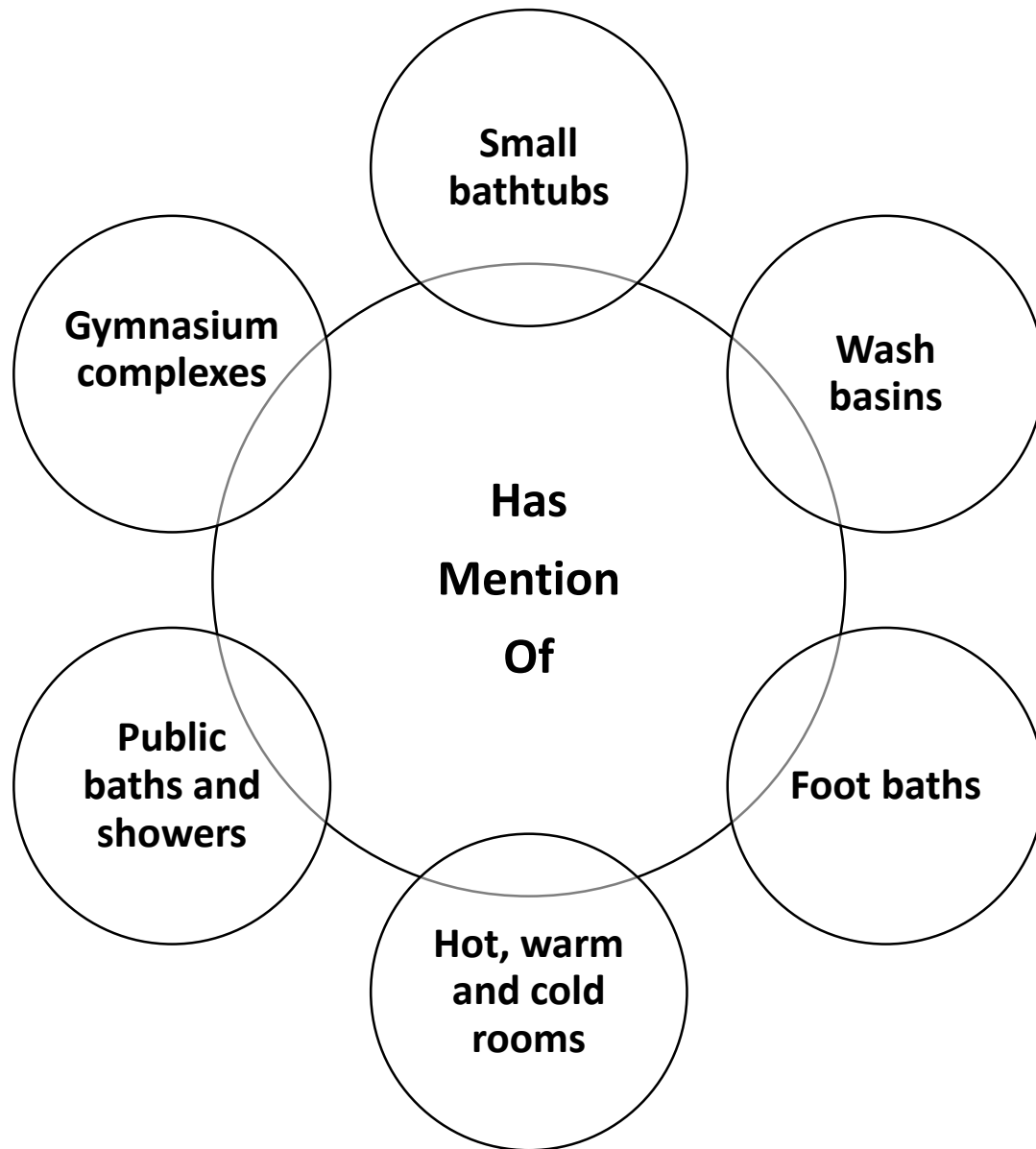


FIGURE- THE ANCIENT GREEK BATH TUB
<https://www.thebathtubdiva.com/history-of-bath-tubs-bathing-part-3/> dated 29/10/2018

Psyche of Bath

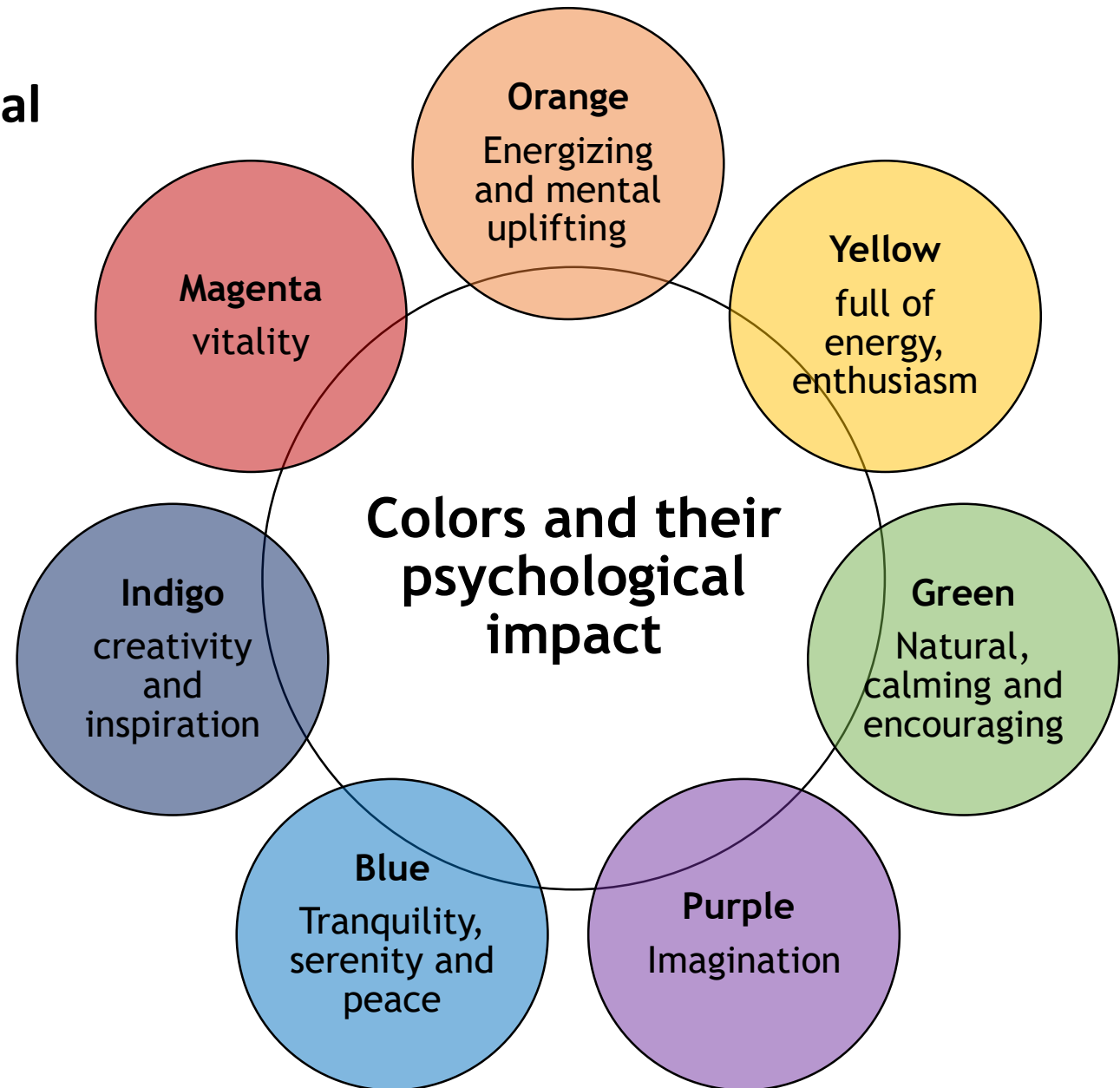
According to Neil Morris, a psychologist at the University of Wolverhampton, said:

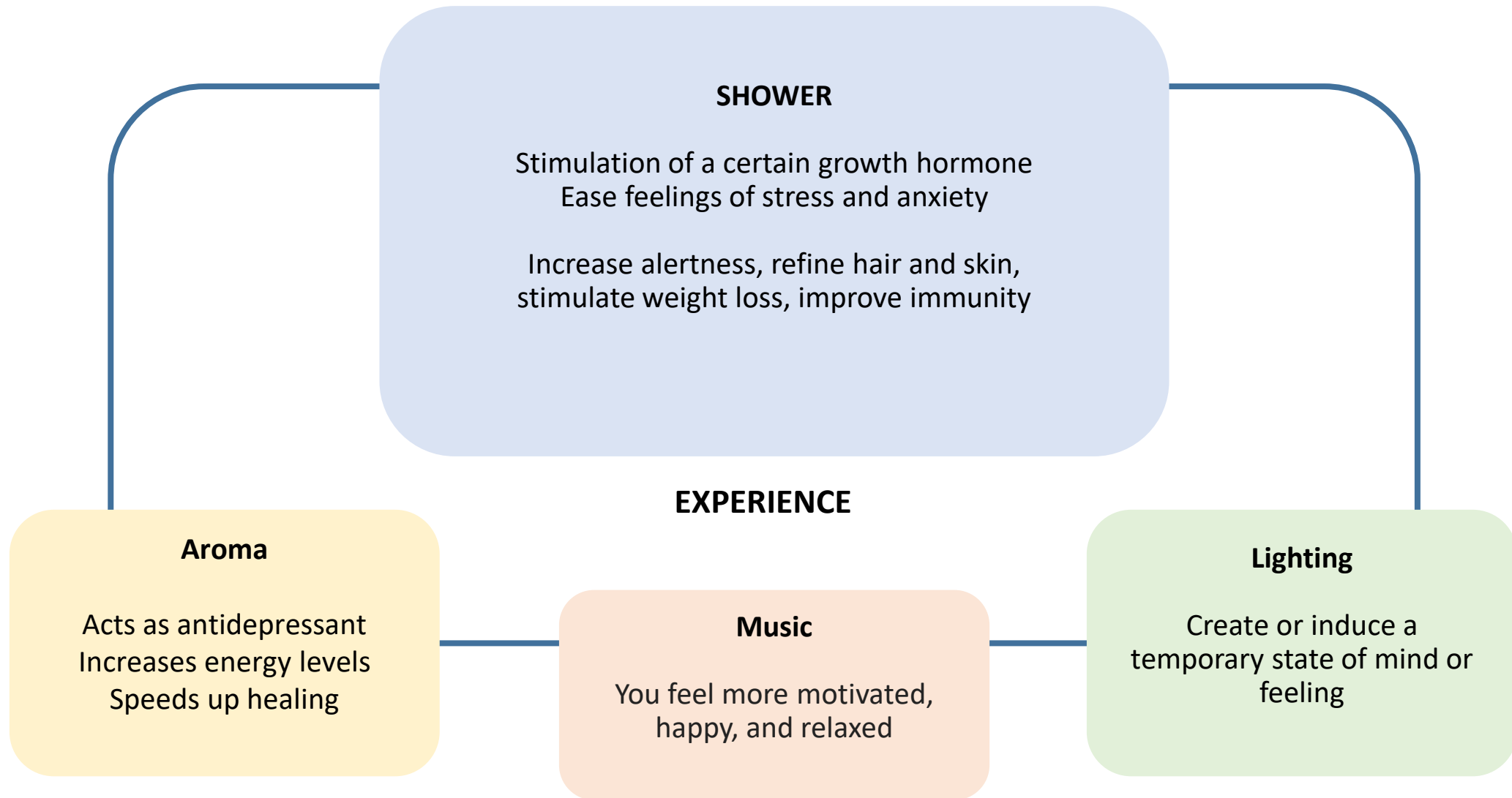
*“I found that bathing **improved general psychological wellness radically.***

*There was a **significant drop in feelings of pessimism** about the future and **increases in hedonic tone** – the internal feeling of pleasurability ... and I believe that the results could be even **more impressive over a longer period of time.***

*Baths give you the chance to stop the day for a few minutes, in a way that showers can't. There is a wonderful combination of **isolation, quiet and comfort**[5].”*

Colors in shower as Emotional Design





DIRECTION OF LIGHT

PSYCHOLOGICAL IMPACT	LIGHTING EFFECT	LIGHT DISTRIBUTION
TENSE	Intense direct light from above.	Non-uniform
RELAXED	Lower overhead lighting with some lighting at room perimeter, warm color tones.	Non-uniform
WORK/VISUAL CLARITY	Bright light with lighting on walls and possibly ceiling.	Uniform
SPACIOUSNESS	Low light level at activity space with a little perimeter lighting and dark areas in rest of space.	Uniform
PRIVACY OR INTIMACY	Bright light on workplace with less light at the perimeter, wall lighting, cooler color tones.	Non-uniform

TABLE -1. EFFECT OF DIRECTION OF LIGHT

<https://www.tcpi.com/wp-content/uploads/2017/12/Psychological-Impact-of-Light-and-Color.pdf> dated 27/10/2018

PRESENT SCENARIO

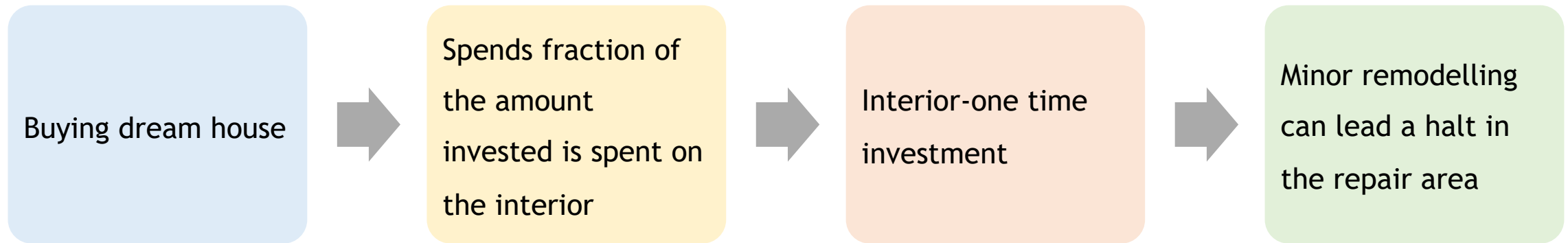




Image 2.1
Immersion
Heater
Rods

Cost:
Rs. 500



Image 2.2
Instant
water
heater
(1-3 Litres)

Cost:
Rs. 6000



Image 2.3
Storage water
heater
(6 Litres and
above)

Cost:
Rs. 15000

Target Gap

Image 2.4
Shower Head

Cost:
Rs. 20000



Image 2.5
High end
Shower Head

Cost:
Rs. 3 lakhs



FIGURE- THE TARGET GAP

EMERGING TECHNOLOGIES

Of smart phones & home appliances



FIGURE- THE CONTROLLING ABILITY OF A SMART PHONE

<https://www.bdshop.com/wireless-switch-for-smart-home-control-sonoff-basic> dated 5/11/2018

VOICE CONTROL



FIGURE- VOICE CONTROLLED BLUETOOTH SPEAKER
<https://img.purch.com/dot-vs-googhome-cov-jpg/w/755/aHR0cDovL21lZGhlLmJlc3RvZm1pY3JvLmNvbS9DL0lvODAzOTYzL29yaWdpbmFsL2RvdF92c19nb29naG9tZV9DT1YuanBn>

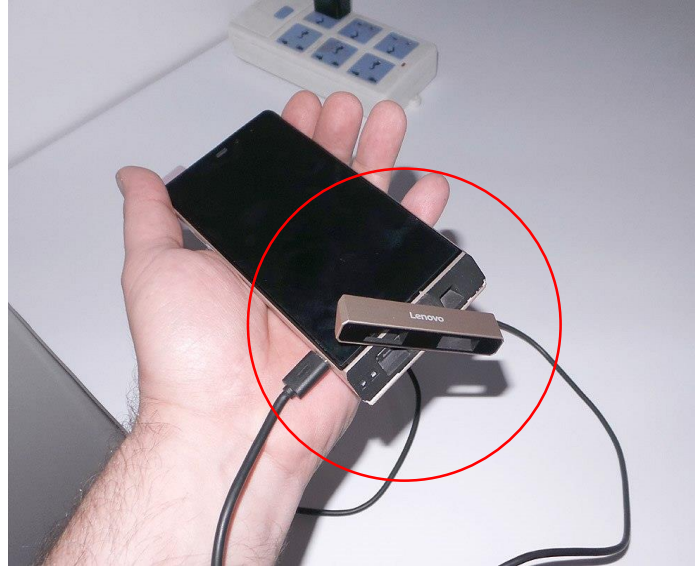


FIGURE- LENOVO SMART CAST
https://1gr.cz/fotky/idnes/15/053/org/JM5b8685_20150528_123855.jpg



FIGURE - LENOVO SMART CAST PROJECTING
<https://i.ytimg.com/vi/pRik7mAe4gM/maxresdefault.jpg>

SMART PHONE WITH PROJECTOR

INTELLIGENT TOILETS BY KOHLER – THE VEIL



FIGURE- THE VEIL

<https://encrypted-tbn0.gstatic.com/images?q=tbn:ANd9GcRpERmrJoweJ9mCjM2LV5FUXBwFt6oFJBNH6jxDBfZOGVtLG43O>

SMART WATCH PROJECTOR

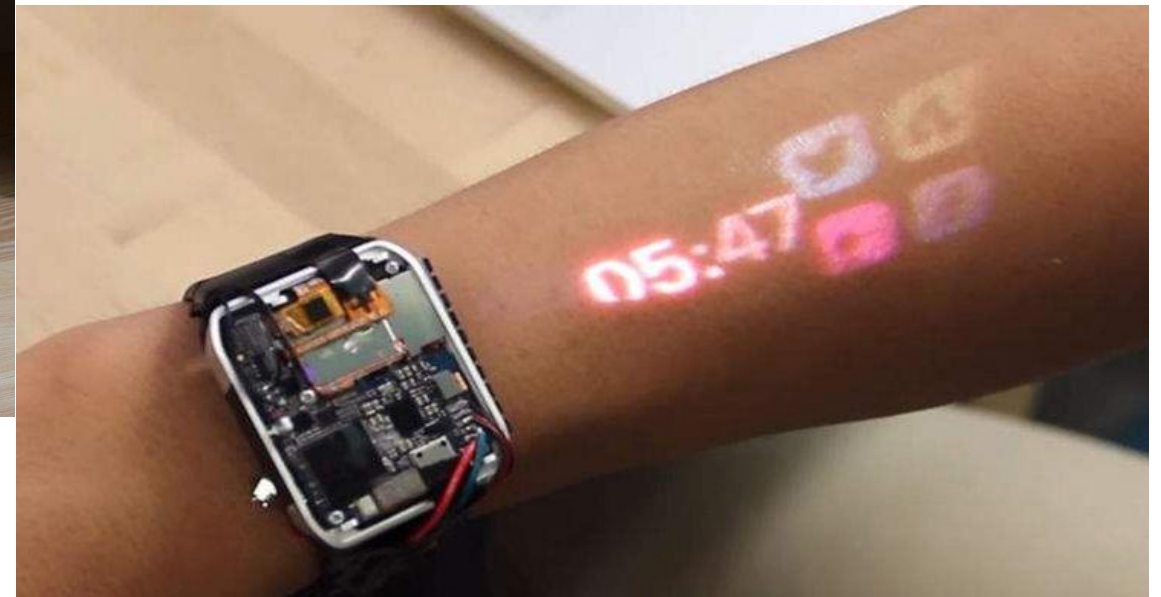


FIGURE- PROJECTING WATCH

<https://media0.mensxp.com/media/content/2018/Apr/this-smartwatch-can-turn-your-arm-into-a-touch-screen2-1525072574.jpg>

ADAFRUIT BREAK BOARD

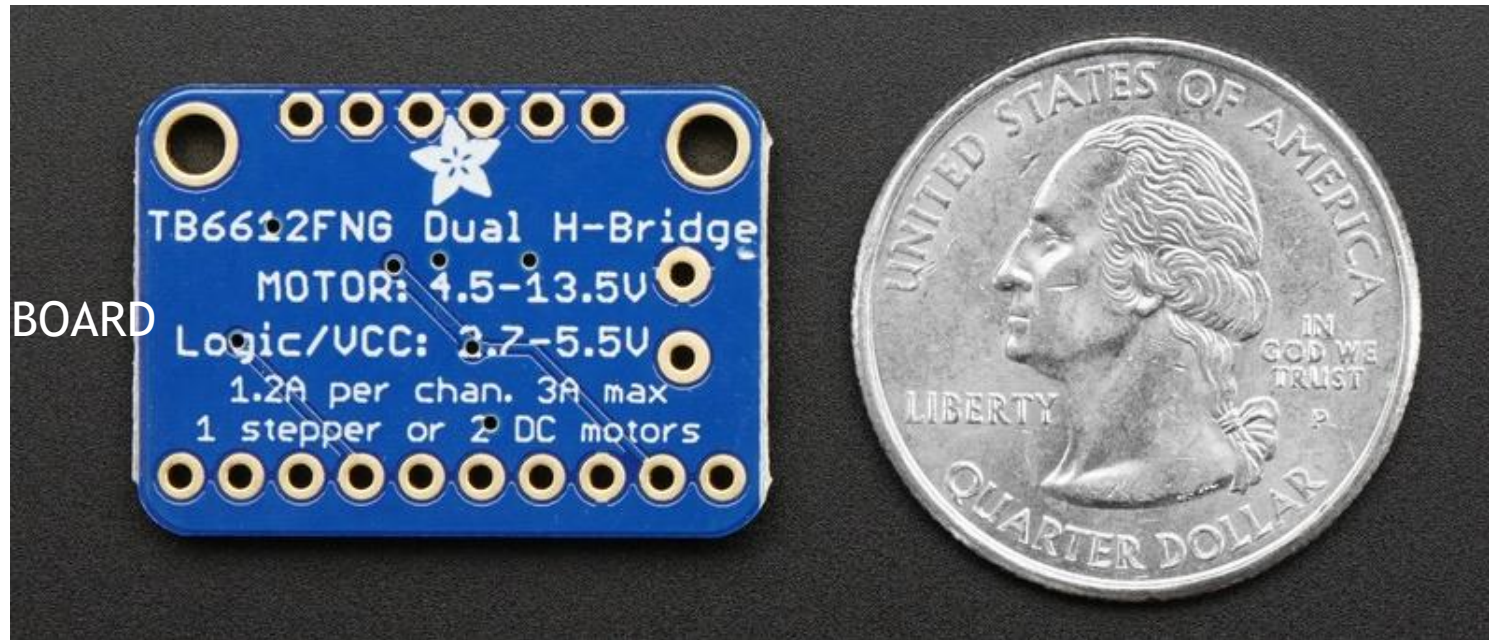
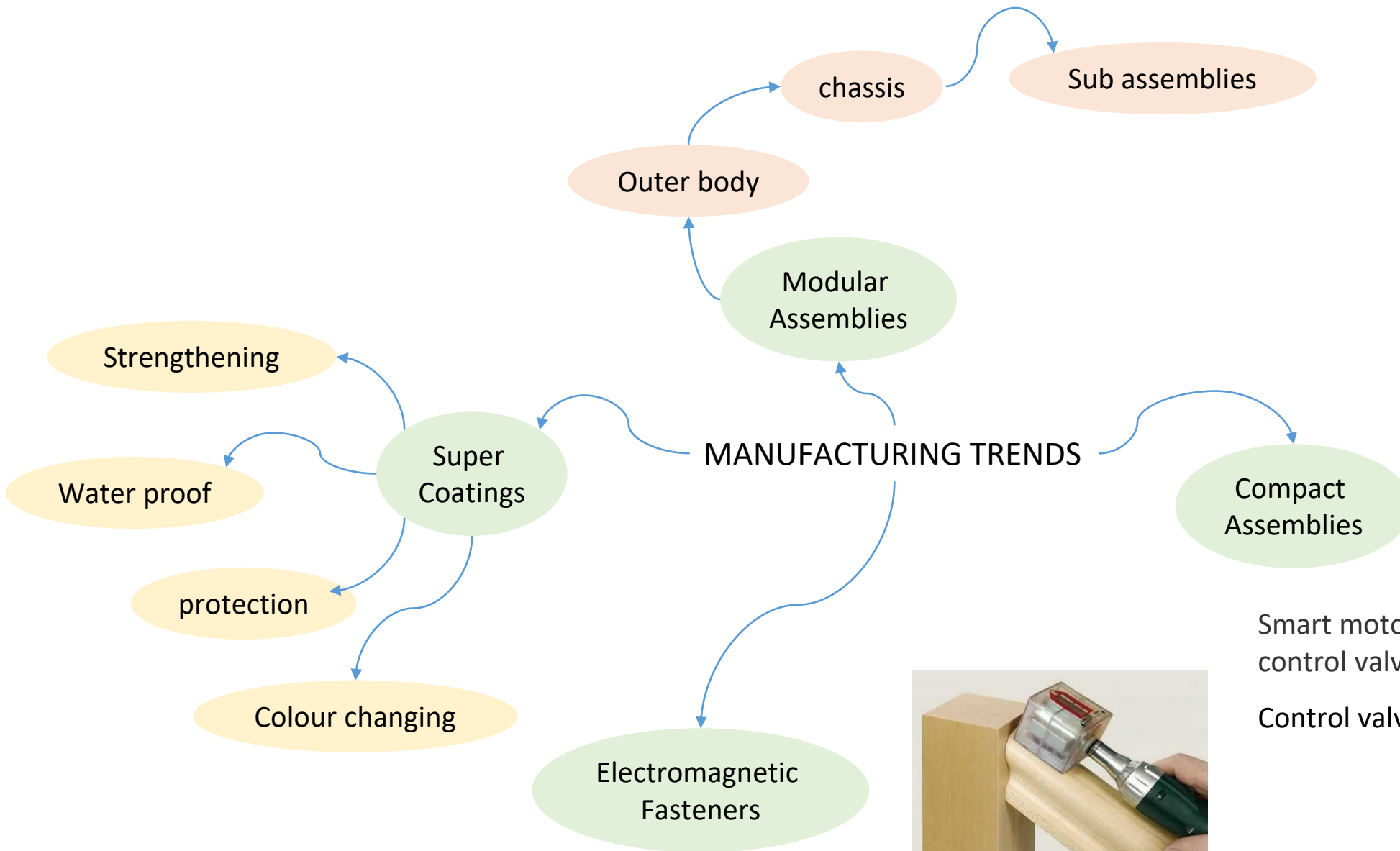


FIGURE- ADAFRUIT BREAK BOARD

FIGURE-10. PROJECTING WATCH https://cdn-learn.adafruit.com/assets/assets/000/024/263/medium800/adafruit_products_2448_iso_ORIG.jpg?1427923448



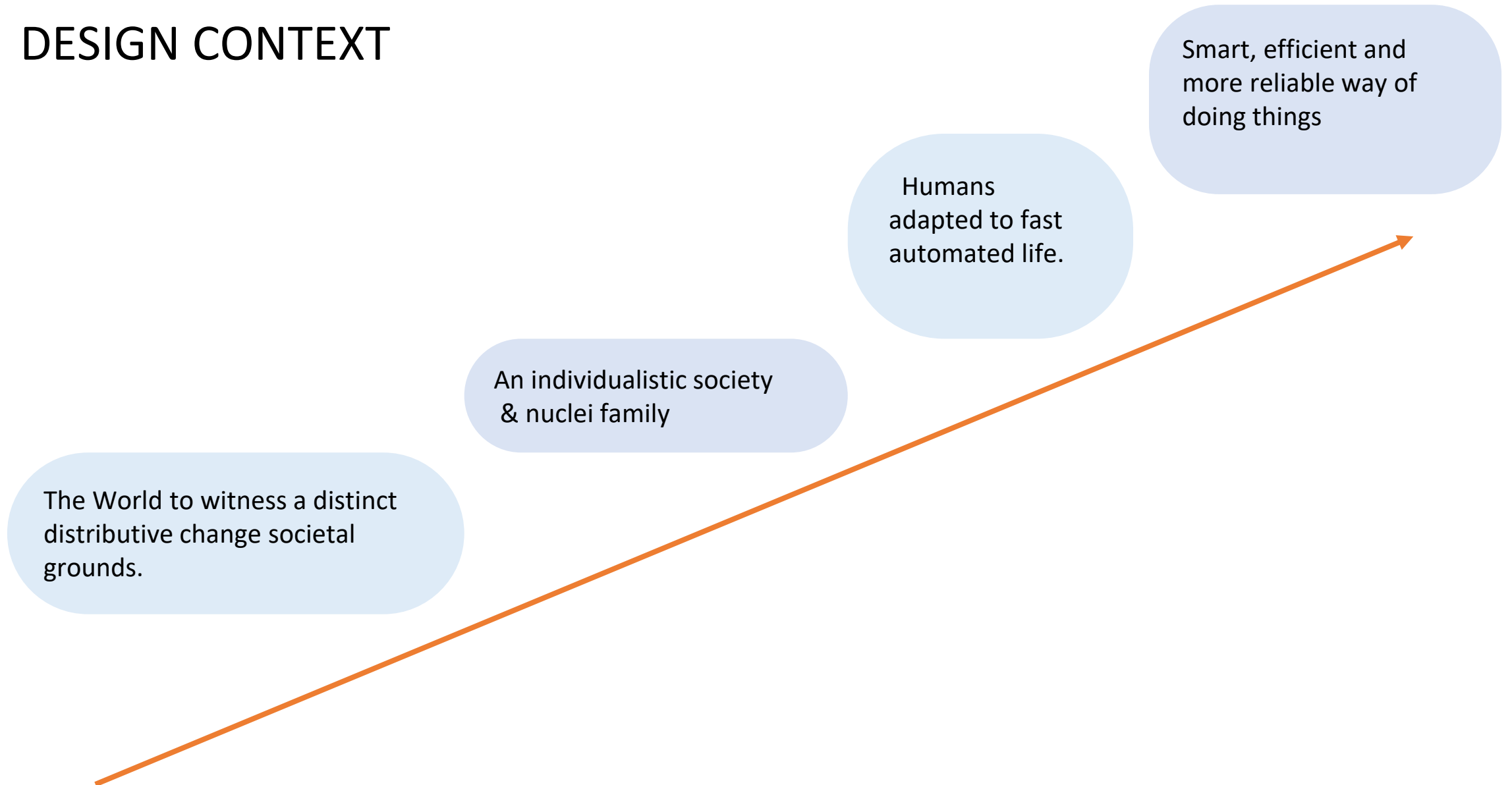
Smart motorized flow control valve

Control valve + Motor + LED indicator



Electromagnetic screw driver

DESIGN CONTEXT



USERS' ASPIRATIONS

USER 1

Old father, who is retired now.

Says-

Me and my wife would also prefer to use it but, I would like to gift one to my son. These young generation is all in love with these automatic stuff.

USER 2

Amal, 22, who is a student

Says-

I feel like controlling my boiler in a way it gives me hot water as I reach home so that I need not wait all tired for taking bath.

USER 3

Young Keerti, 24, who is an UPSC aspirant

Says-

It bothers me to monitor heating water with immersion rod every time I have to bath. It is time consuming.

USERS' ASPIRATIONS

USER 4

Nilesh, 32, who runs a business

Says-

Who would miss a chance to take shower in leisure and peace ... in my demanding life that's a time when I can feel relaxed and be less attentive.

USER 5

Vijaya, who is an assistant professor

Says-

Its always an issue for my parents to operate one.
I want to control my boiler seating in my cabin from college itself.

USER 6

Sameer, 29, who is a software engineer

Says-

I daily travel by local trains & it adds to my fatigue. Daily after coming home I prefer a ritualistic healing Shower. ..It adds a lot to my energy.

PRESENT CONDITIONS



FIGURE-11
Water heater mounted at top corner of bathroom with almost not accessible to operator for people with shorter height.



FIGURE-12
Water heater mounted inside the bathroom in the corner at high height of 8.5 feet.



FIGURE-13
Switch of the wall concealed unit gets dirty in as it is located inside the bathroom.



FIGURE-14
Water heater mounted inside the bathroom in the corner at with all pipes obstructing space of users to access.

A Survey conducted resulted as

**PARAMETER:
FORMAL EXPRESSION**

1. Innovative
2. Sleek
3. Minimal
4. Modern
5. Radical
6. Distinct

**PARAMETER:
DESIGN APPROACH**

1. Longish -like a sound bar
2. Flat - not protruding higher from wall
3. Triangular -that occupies the corner

**PARAMETER:
INTERFACE**

1. Voice controlled
2. Touch screen
3. Digital display
4. Analog controls
5. Only light indicators

**PARAMETER:
EXPECTATIONS**

1. Smart
2. App controlled
3. Combined shower
4. Music player or radio
5. Dancing lights
6. Backlight
7. Bathroom illumination

PROBLEM FACED BY USER

'I faced issue related to heated water temperature, sometimes it was too high as it caused redness on skin and sometimes it was too cold as gives me feelings that I was bathing in ice water. Only because of improperly mixing of hot and cold water'

'Fittings are difficult to clean at higher heights'

'It's like dabba...and collect a lot of webs on fittings in the corner'

'Carrying it while travelling is an issue'

'Uncontrolled temperature of shower'

'High electricity consumption'

'Space occupied is more and dominates the bathroom space'

'Feels very heavy'

'Cleaning the product is an issue'

'It hardly predicts the water supply failure'

SYNCHRONIC ANALYSIS

Understanding 'wallmountedness' of wall mounted products

GROUP- General appliances

PHYSICAL FEATURES

Clean edges

Continuity of surface

Confined space

FORMAL EXPRESSION

Strong

static

Stable



GROUP- Kitchen appliances

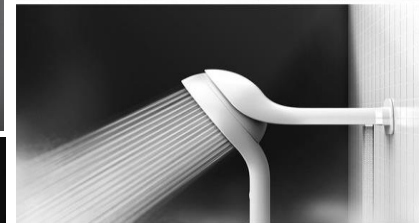
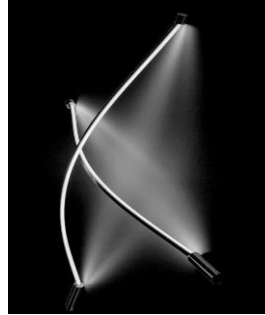
PHYSICAL FEATURES

- Clean edges
- Continuity of surface
- Slender body

FORMAL QUALITY

- Precise
- Delicate
- Dynamic





GROUP- Bathroom/washroom appliances

PHYSICAL FEATURES

Defined edges

Continuity of surface

Less contact with wall

FORMAL QUALITY

Strong

Soft and gross

Delicate

IMAGE COLLAGE-3

GROUP- Living-room appliances

PHYSICAL FEATURES

FORMAL QUALITY

Defined edges

Strong

Continuity of surface

Stable and Strong

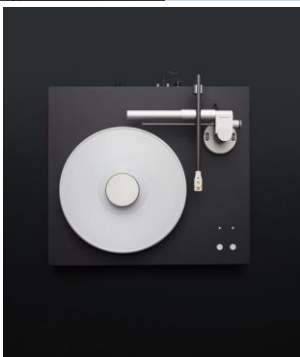
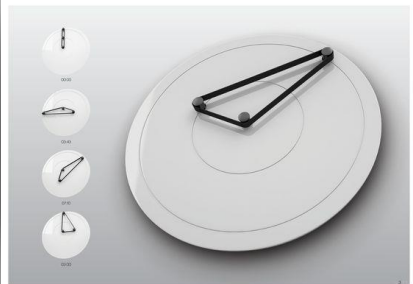
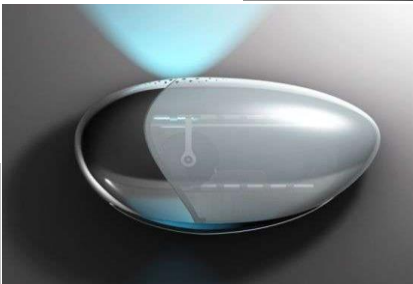
Fillets and curvatures

Soft and Dynamic

Defined Surface Contact

Stable and Reliable

IMAGE COLLAGE-4



DIACHRONIC ANALYSIS

Understanding 'wallmountedness'
of Inside-bathroom wall-mounted appliance.

Group : Cylindrical Body

PHYSICAL FEATURES

FORMAL EXPRESSION

Uniform surface

Strong, soft and reliable

Small and large fillets

Adds to the integrity of body

Colour contrast

Makes it look safe

IMAGE COLLAGE-5



Group : Compact Boxy Body

PHYSICAL FEATURES

FORMAL
EXPRESSION

Non-Uniform surface

Edgy

Uneven fillets

Soft and Stable

Frontal seamlessness

Strong

IMAGE COLLAGE-6



Group : Squared Body

PHYSICAL FEATURES

FORMAL EXPRESSION

Uniform flat surface

hard and reliable

Bends and fillets

Makes it clean and modern

Defined edges

Strong

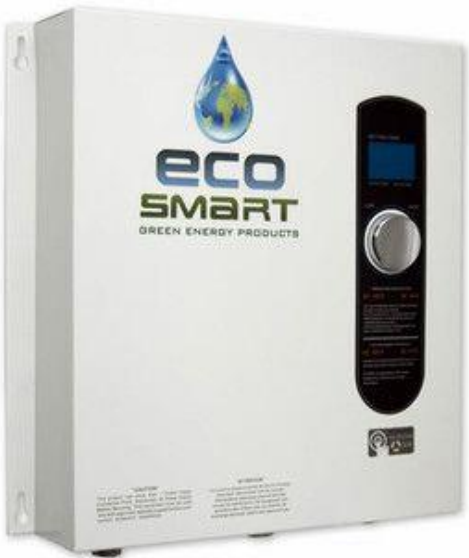
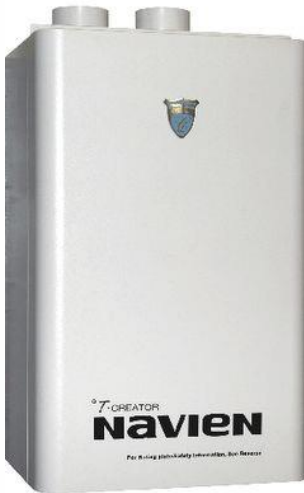


IMAGE COLLAGE-7



Group : Distinct Spheroidal Body

PHYSICAL FEATURES

FORMAL EXPRESSION

Uniform surface
Curvatures

soft and reliable
Adds to the integrity of
body and makes it
appeal neat.

Tint

calm



IMAGE COLLAGE-8

The desired device can be multi-orientable.

The desired device need not be boxy and confined.

Good interaction creates a sense of relief and comfort.

KEY INSIGHTS FORM ANALYSIS

Well thought graphics can compliment the form and product interface.

Seamless bodies with balanced form and graphics are more visually pleasant and approachable.

CONCEPTUAL MAPPING

Group:
Distinct-Innovative
Formal Expressions:
Sleek,
Innovative,
Minimal,
Modern,
Radical.



FIGURE- CONCEPTUAL MAPPING

DESIGN OBJECTIVE

To Design a Next generation device for Bathing experience

DESIGN BRIEF

Operating Conditional Locations

- Urban sites/locations with ample of water supply is available for domestic usage
- People preferably having stored water in their housing/apartments

Target Users

- Transient young urban people who are working
- Modern parents and grand parents
- Nuclei urban families

Housing Pattern

- In apartments and individual houses where the bathrooms are modern or luxurious

Usage Pattern

- Regularly –twice a day for at least two family member

Maintenance

- Once in 6 months or an year

Configuration

- Instant water heating (Max. 3 l)
- Orientation – H, V or Both
- Customisable to music , graphics, looks and function
- Smart control

USP

- Emotional design with sense of comfort out of better product utility and interaction

Major Subsystems

- Heating system
- Piping system
- Shower unit

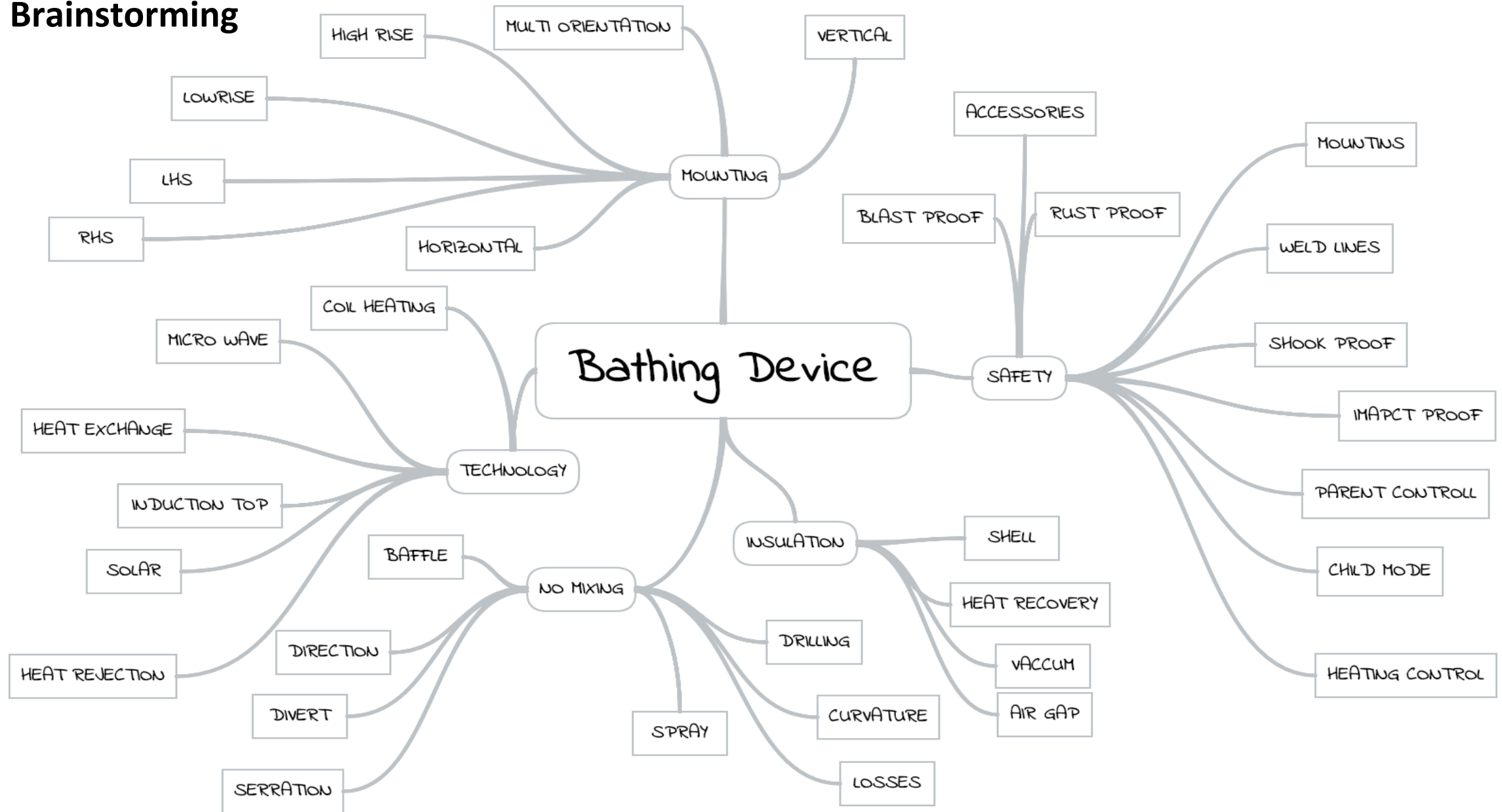
Micro Environment Of Use

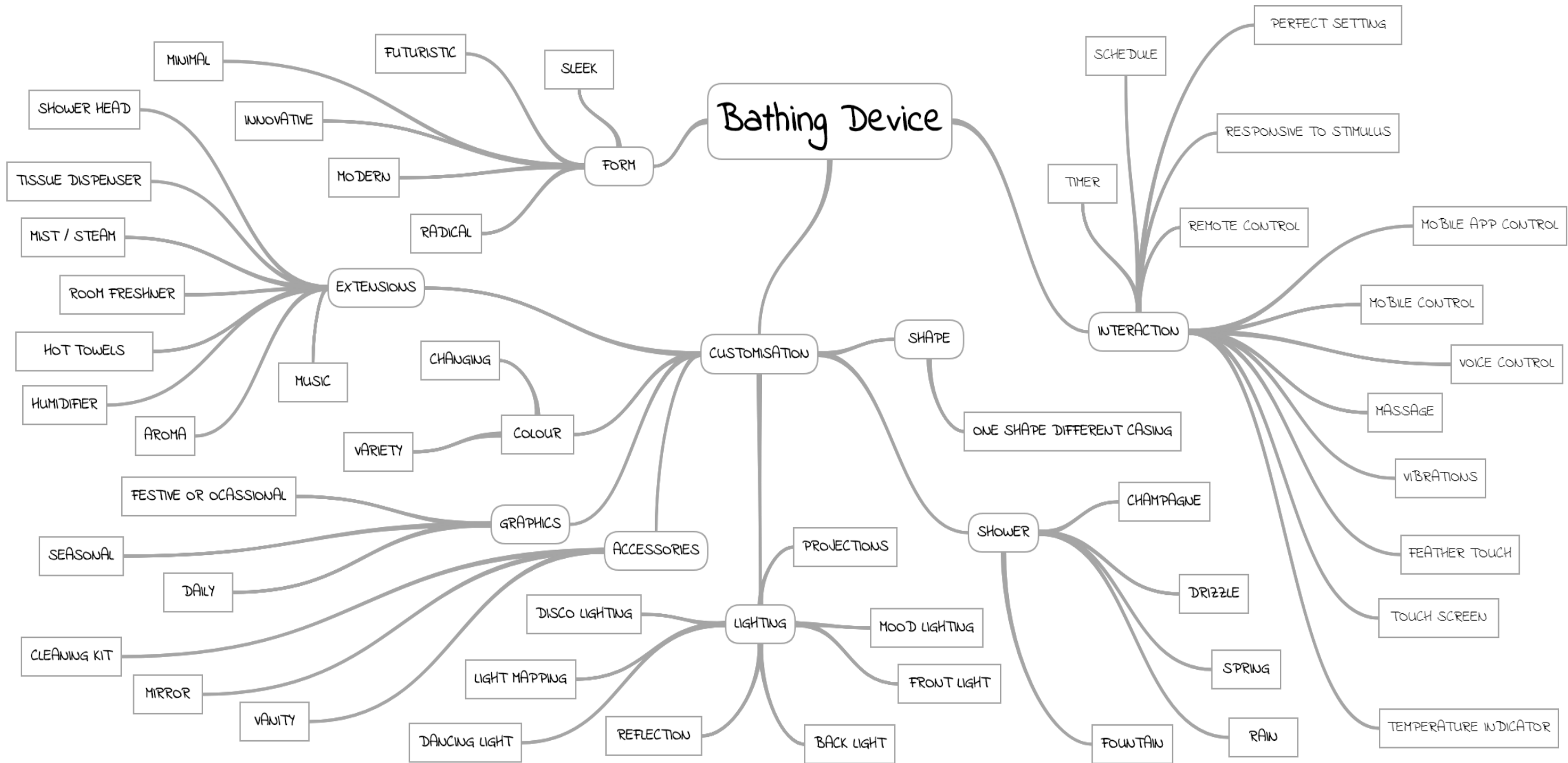
- To be located inside the bathroom in an accessible manner

Income group

- Upper Economy Segment and Lower High Class

Brainstorming





MOOD BOARDS & IDEATIONS



Fine surface finish



Smooth transition in cross-section



Fluid & Glossy surface



Strong continuous reflections



Seamless regular surface

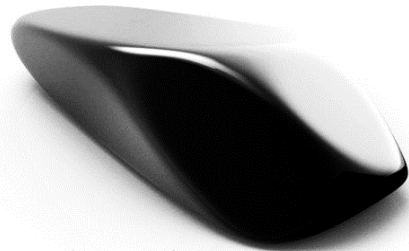
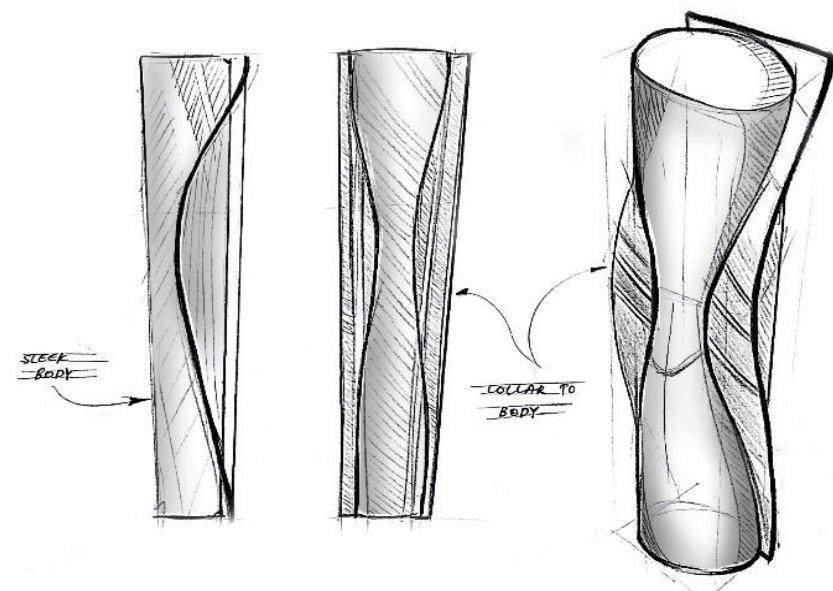
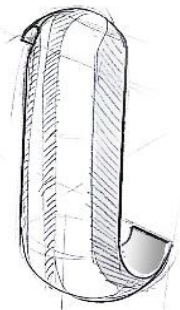
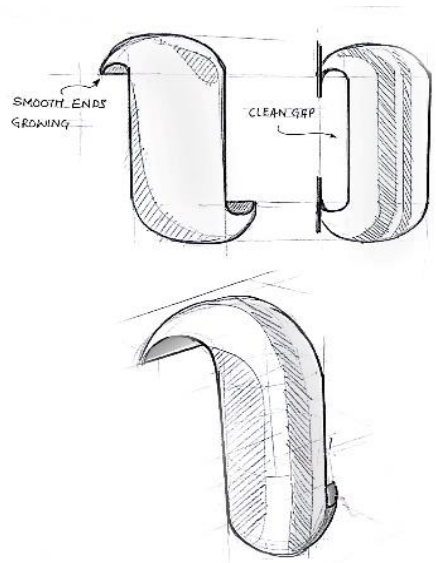
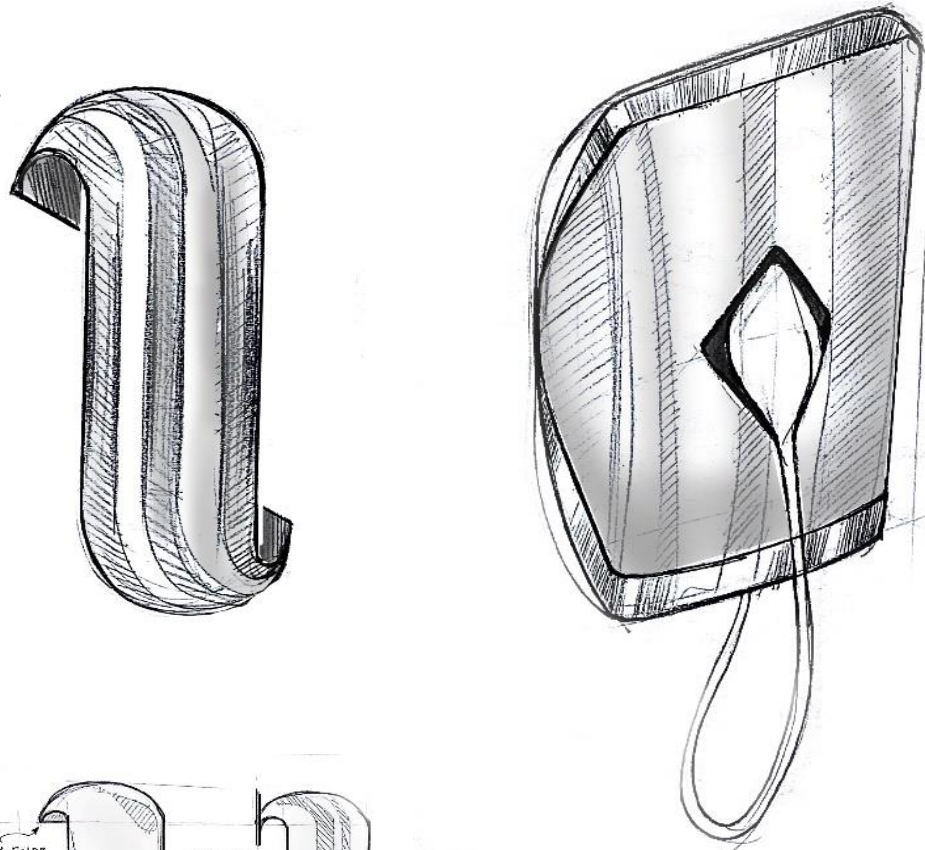


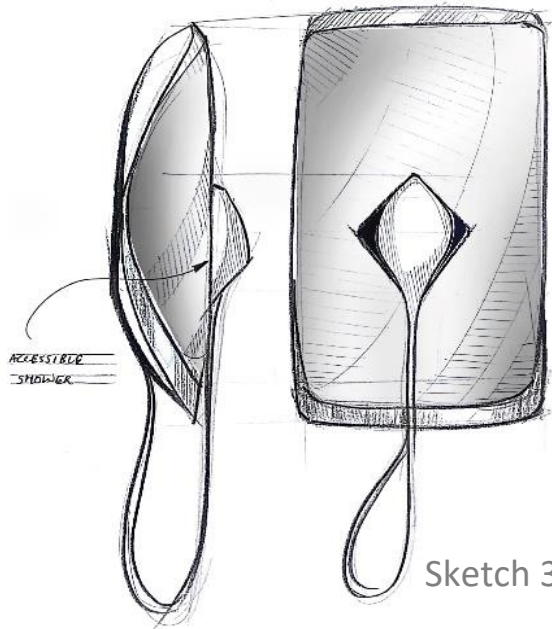
FIGURE-19

SLEEK

Sketch 1



Sketch 2



Sketch 3

INNOVATIVE

Unconventional



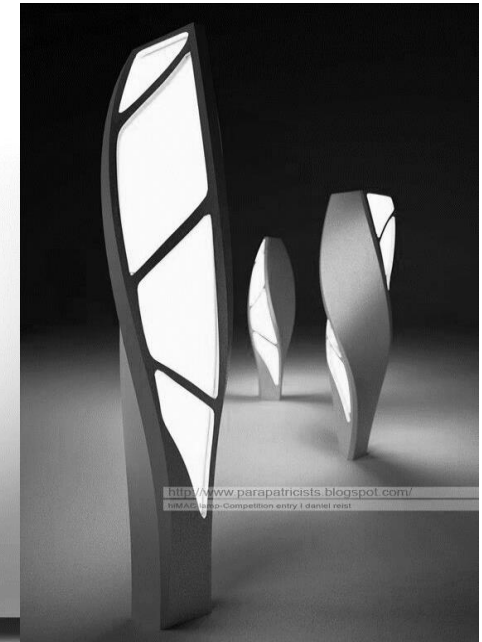
Integrity in structure



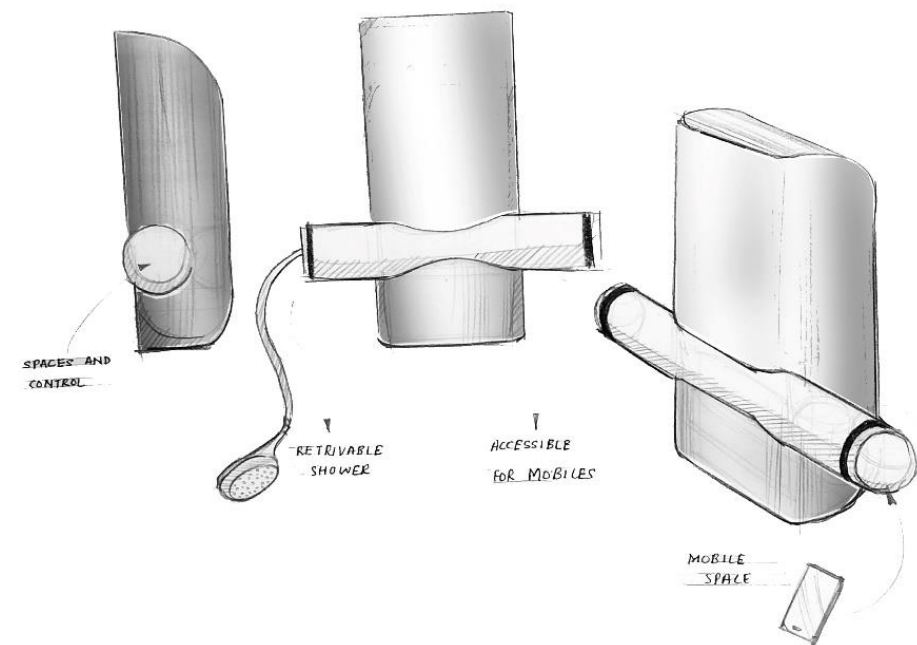
Regular but novel



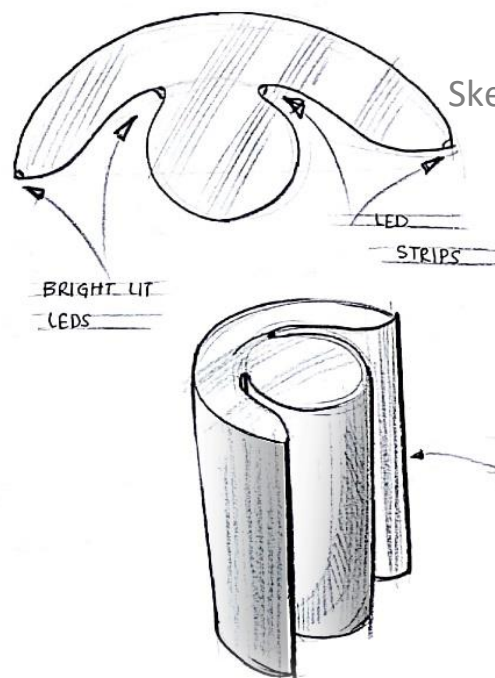
Smooth transition in cross-section



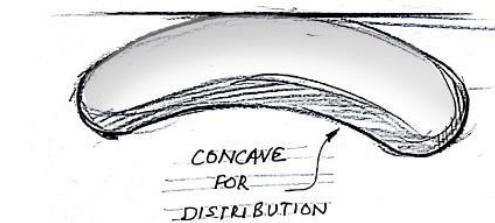
Defined continuity in transitions



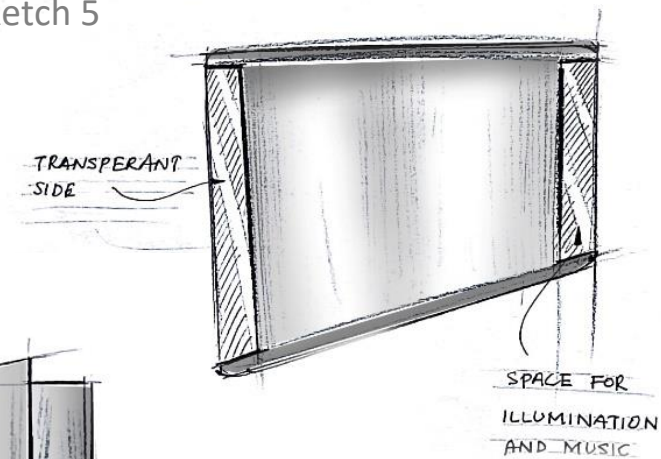
Sketch 4



Sketch 6



Sketch 5





Exploration in use of different materials



Retro features with balanced simplicity



Clean and dynamic



Hints manufacturability

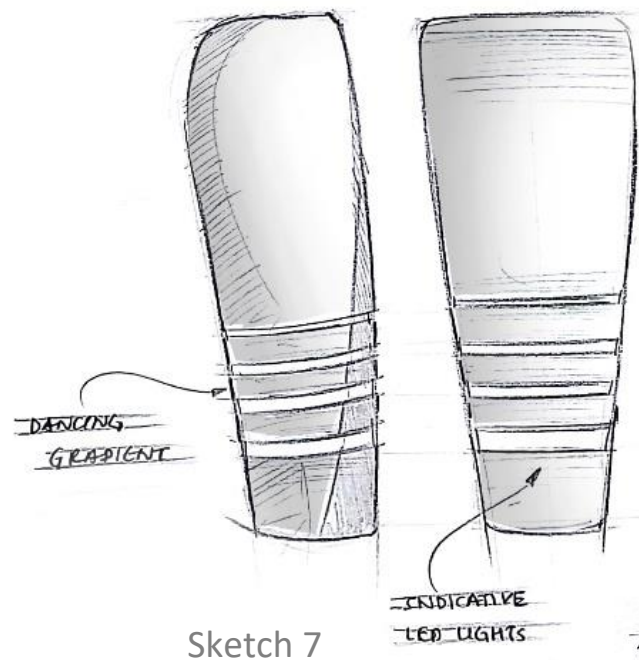
Metallic elemental making a statement

Defined strong edges

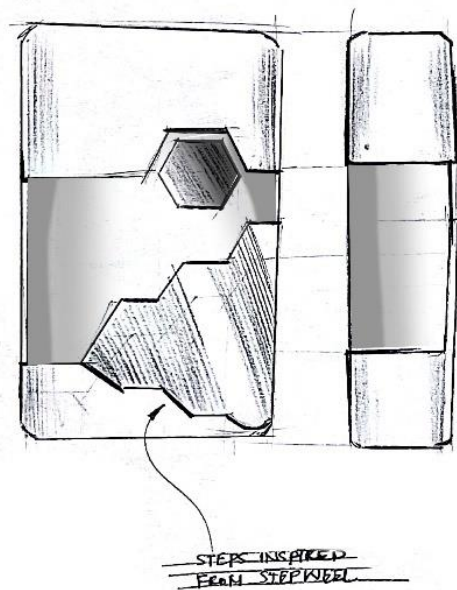


Colour tones achieved by edges, bends or curvatures are prominent

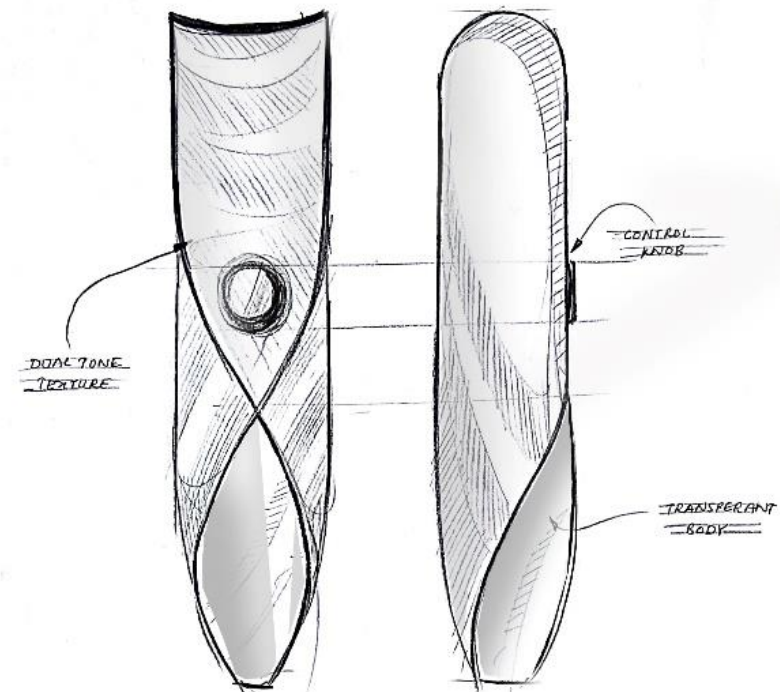
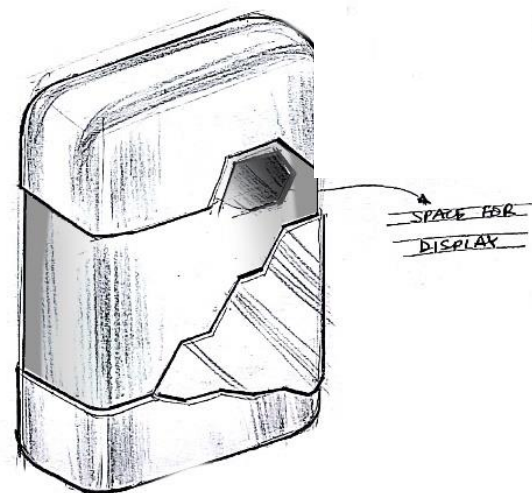
MODERN



Sketch 7



Sketch 9



Sketch 8

Subtle transitions in volumes



Matt finish



Clean joints

Basic forms



Transparency

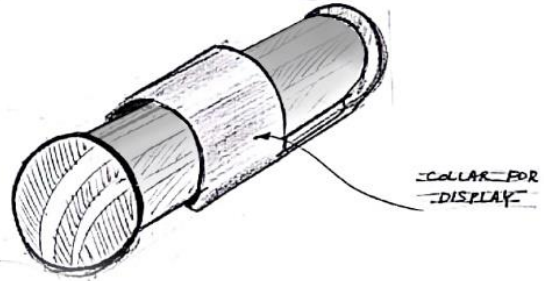
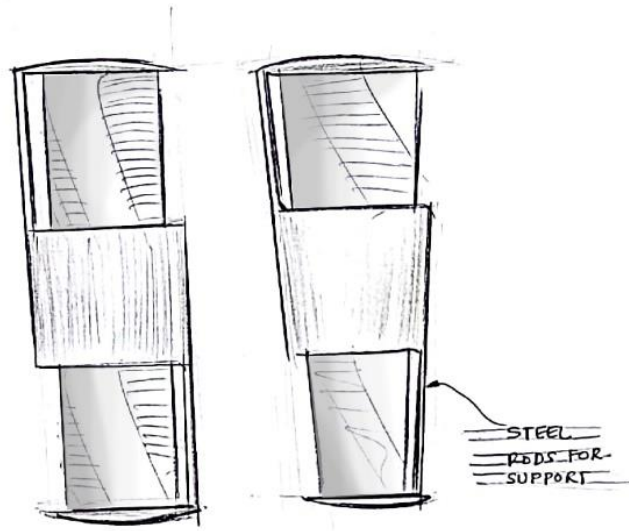
MINIMAL

Pastel colors

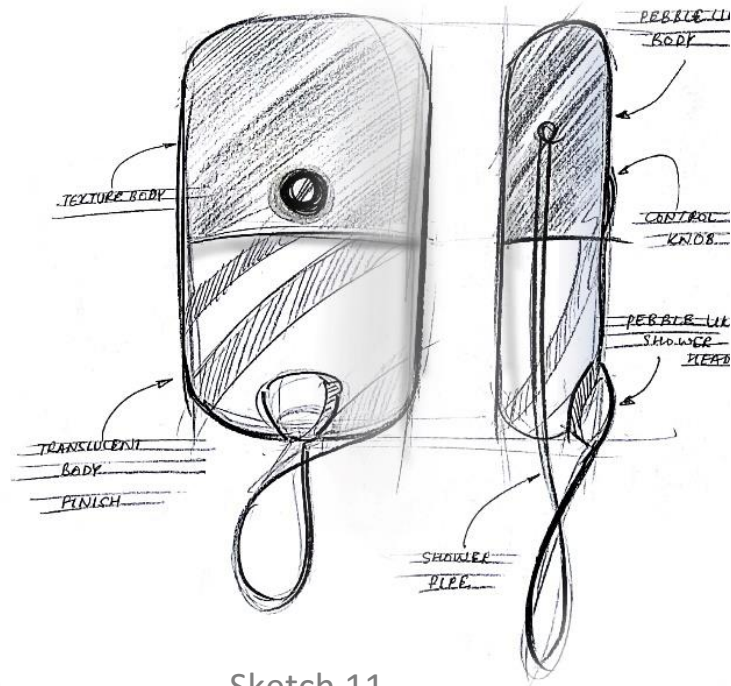


Smooth
surface and
least colour
combination
s

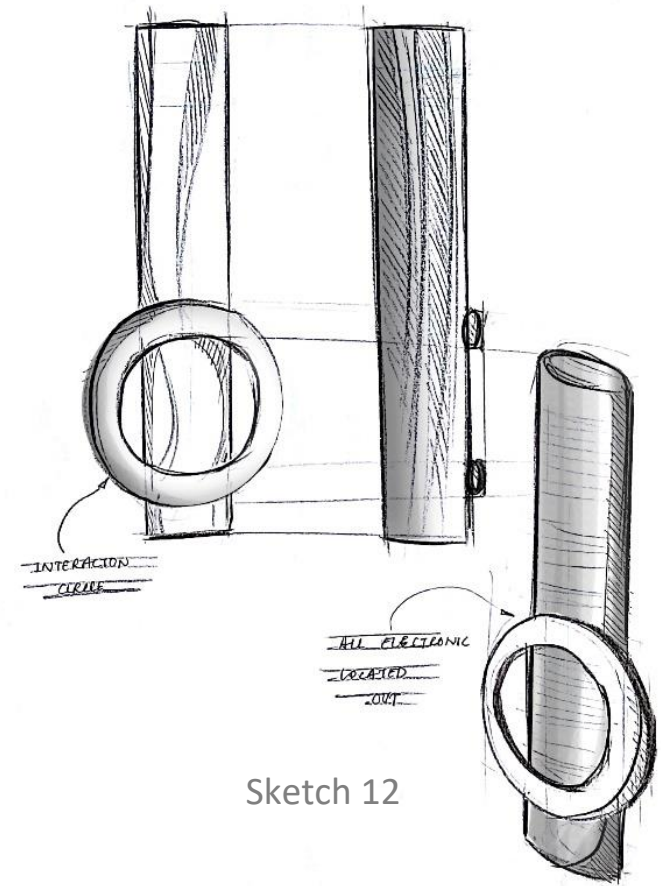




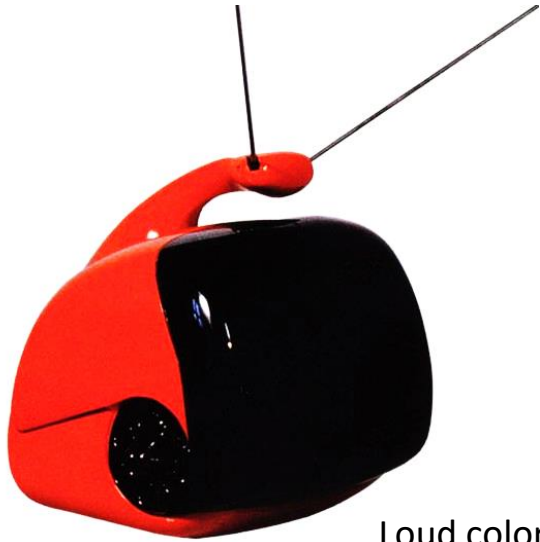
Sketch 10



Sketch 11



Sketch 12



Loud colors

Funky



Gross Crude and raw



Humor with semantics



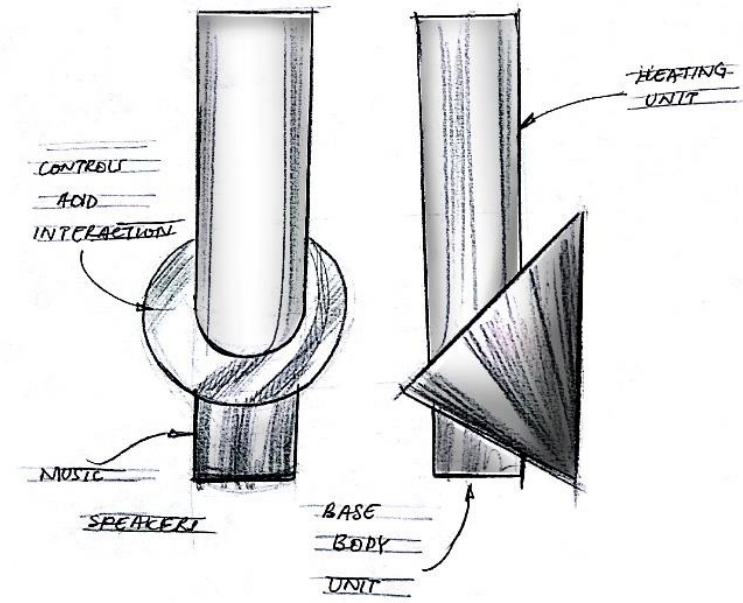
RADICAL



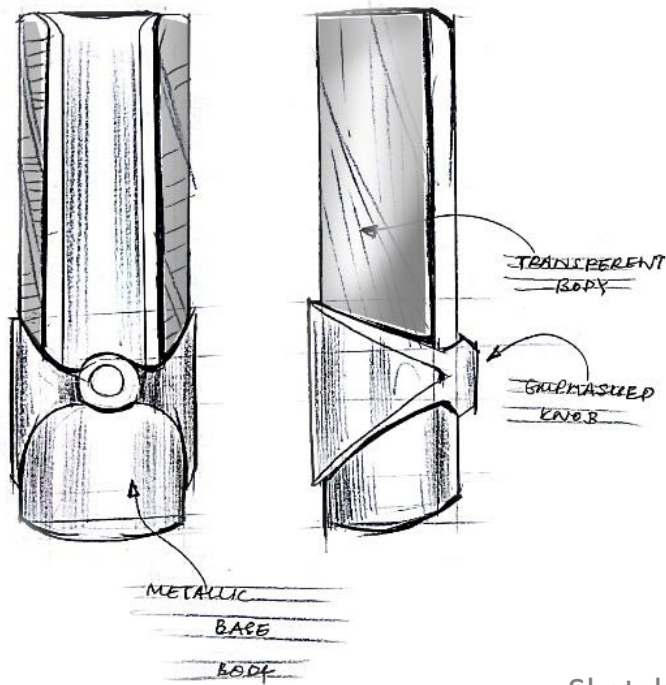
Precisely missed



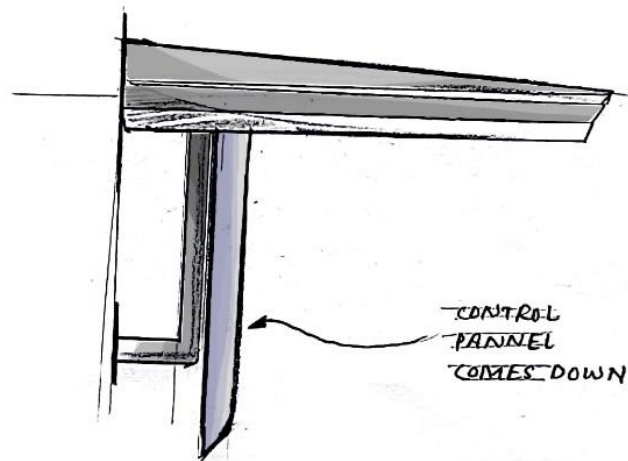
Personification



Sketch 13



Sketch 14



Sketch 15

CONCEPTS

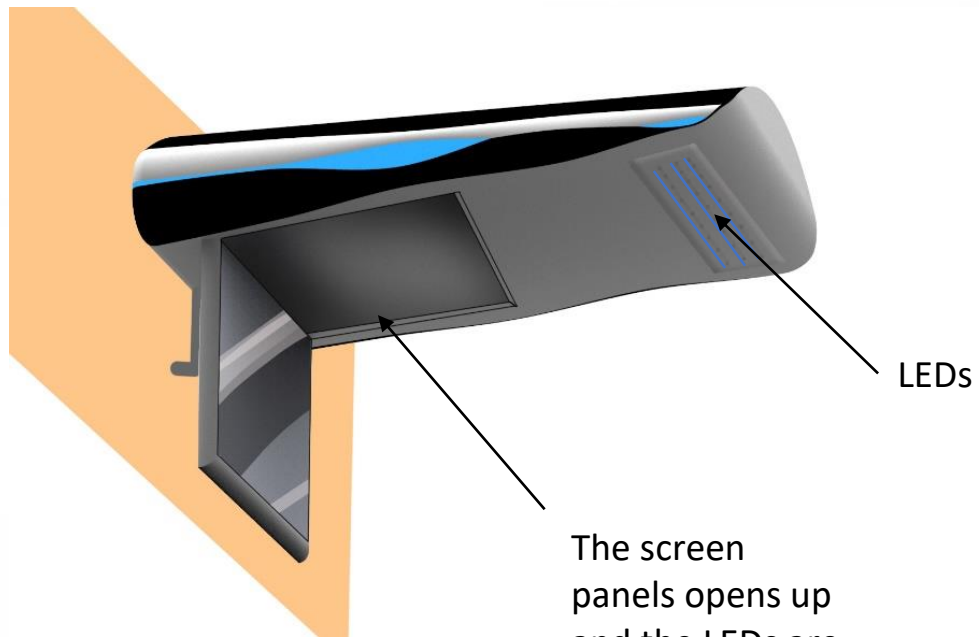
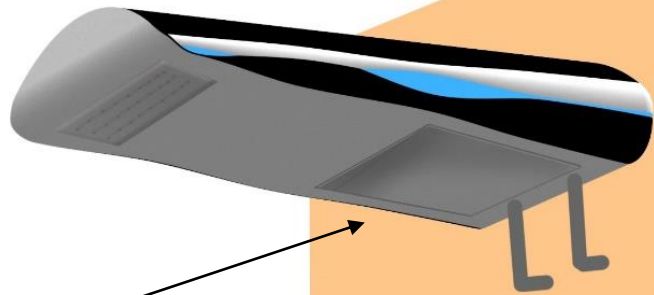
Concept 1

Inspired from Cantilever
Beam

The idea was to create a openable and a cantilever –like mounted system, that would open to user's proximity and operate if required.



The screen panels is closed confined in the body



LEDs

The screen panels opens up and the LEDs are lit.

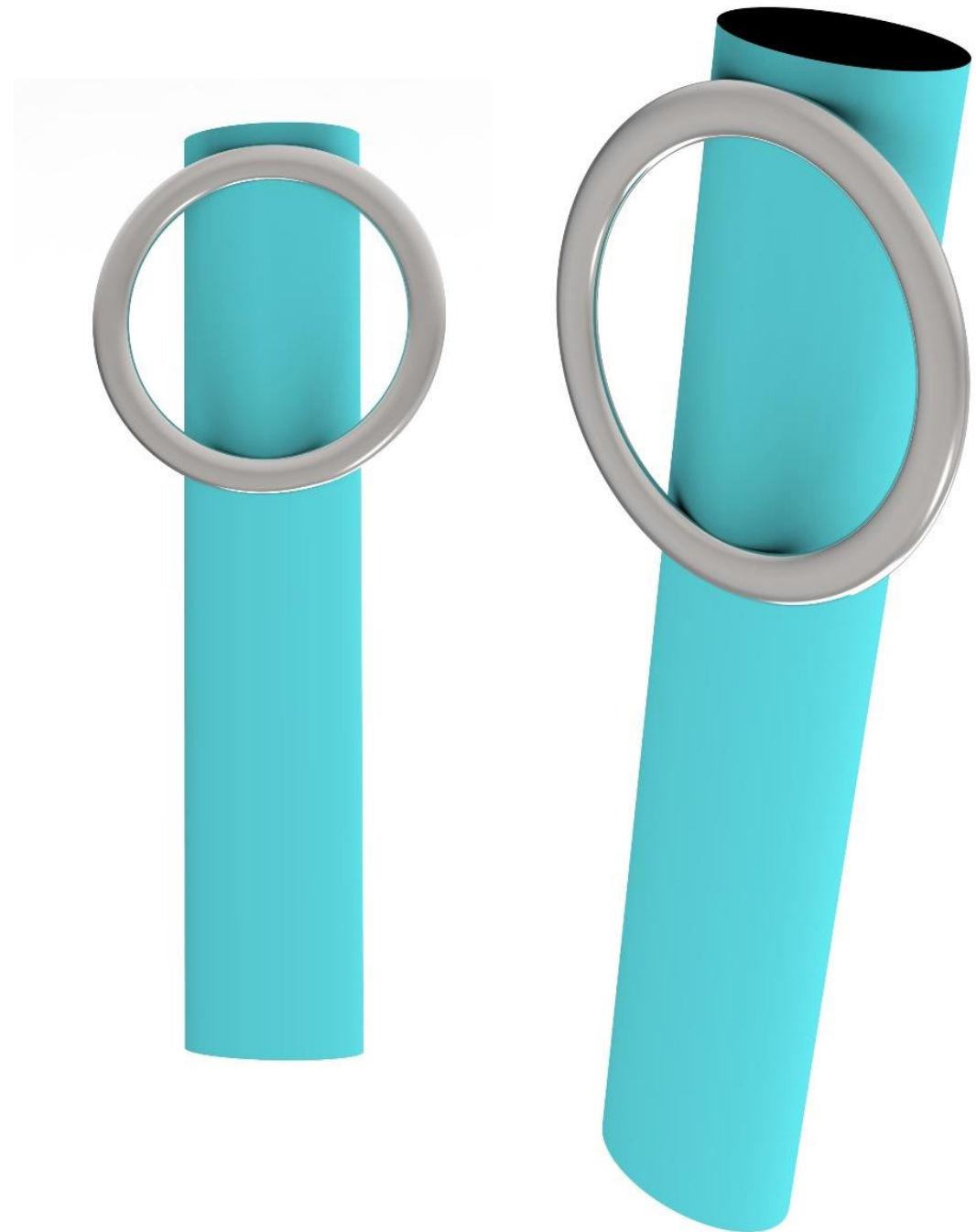


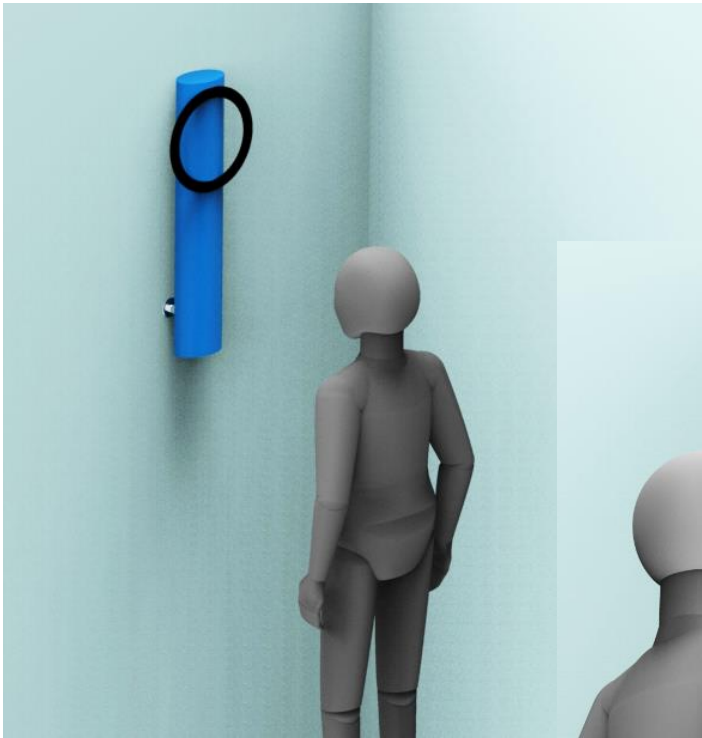
Shower from over head

Concept 2

Inspired from Steering wheel

The idea was to create a minimal design with simple forms and novel appeal.





Senses the presence of user



Opens up to indicate the shower head

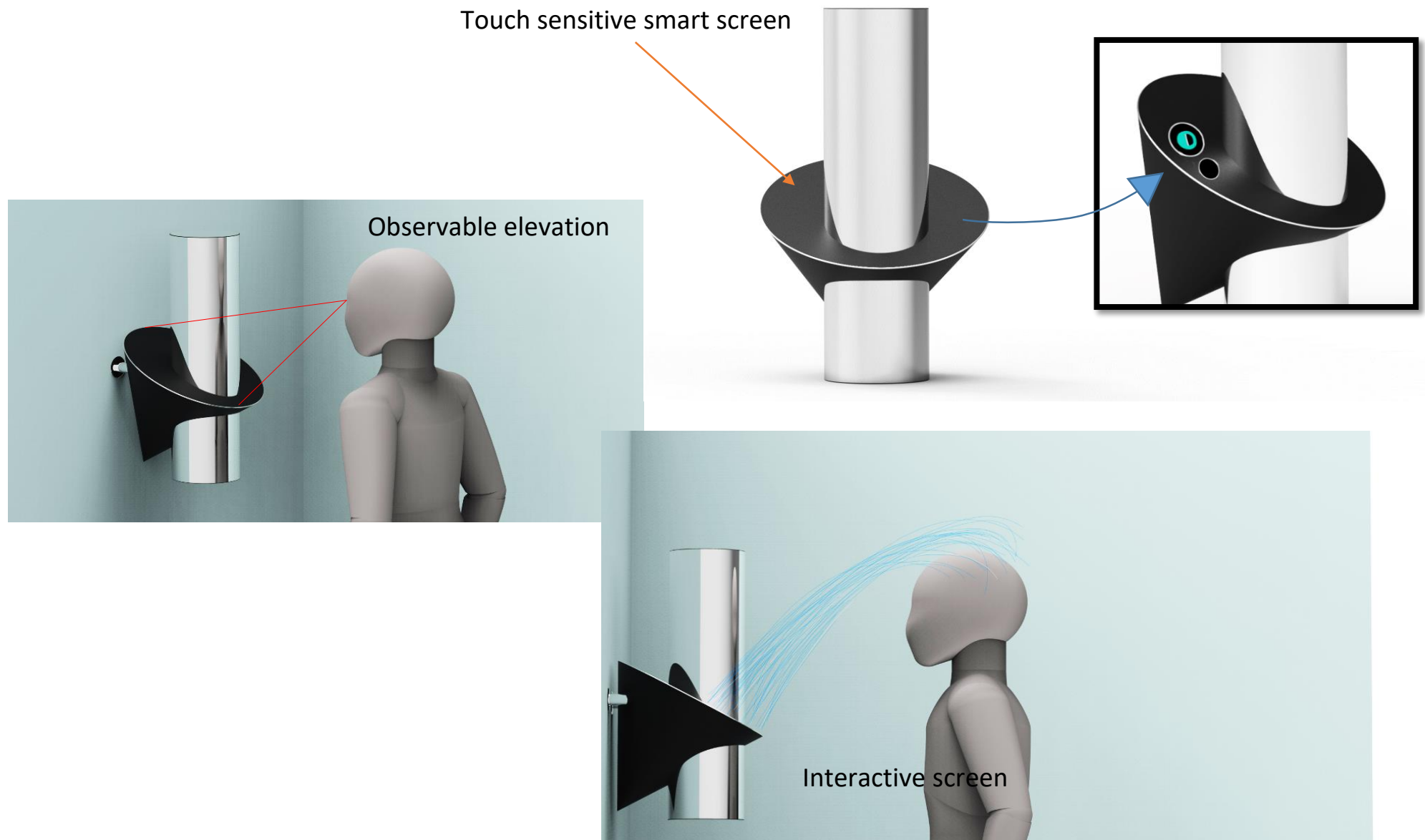




Concept 3

Inspired from Geometric
Intersection

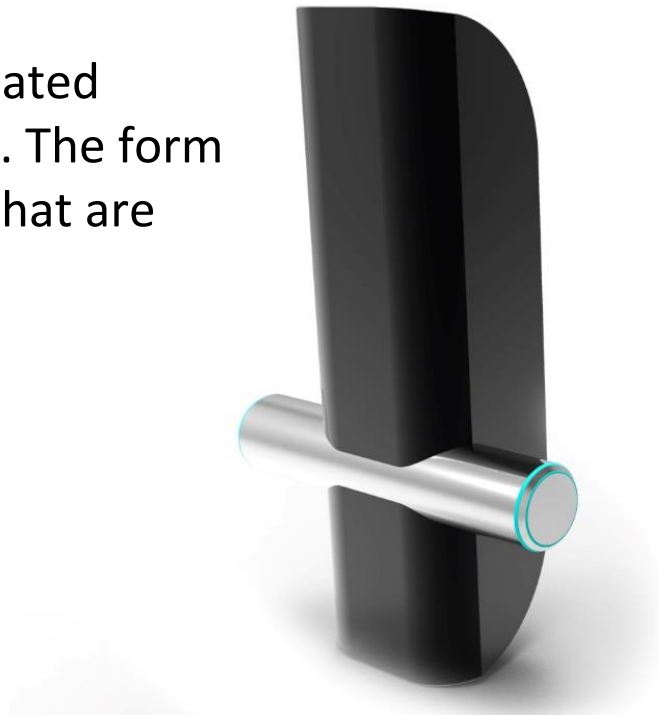
The idea was to create a design that would make a loud statement by form inspired from primitive geometric volumes and intersections.

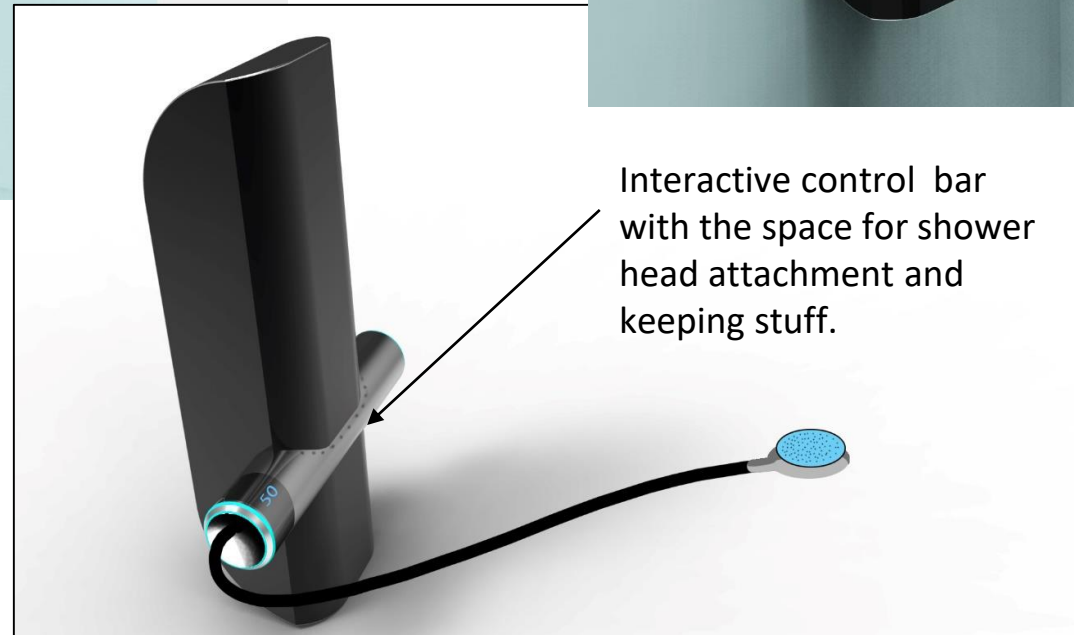
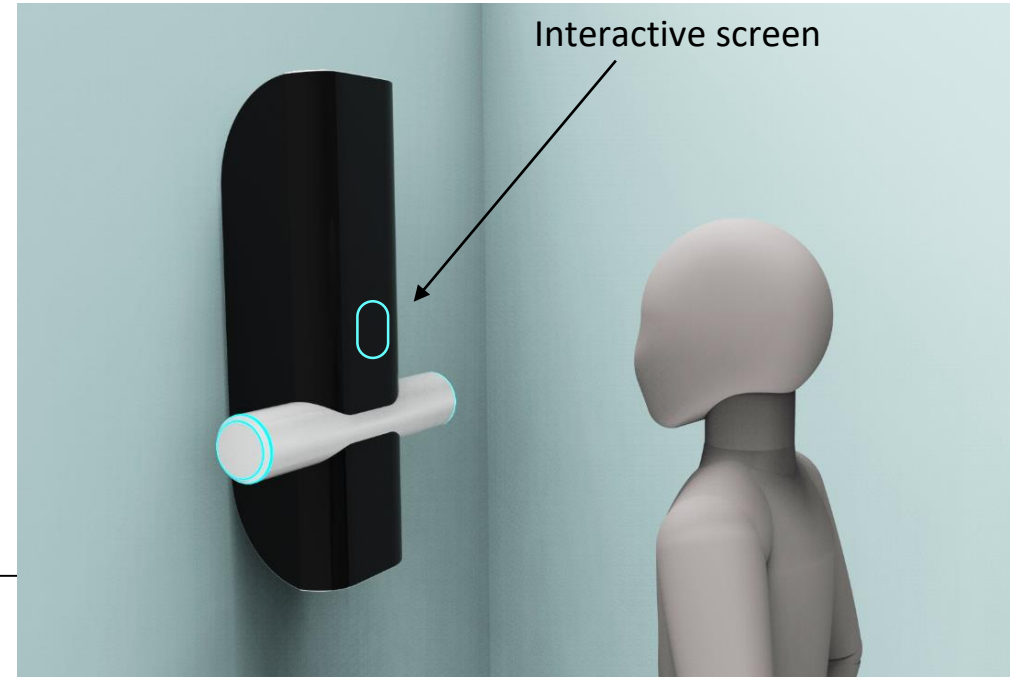


Concept 4

Inspired from CNC controls

The idea was to make use of dedicated space by the structure of the form. The form is inspired from the CNC controls that are big enough to comfortably grip.

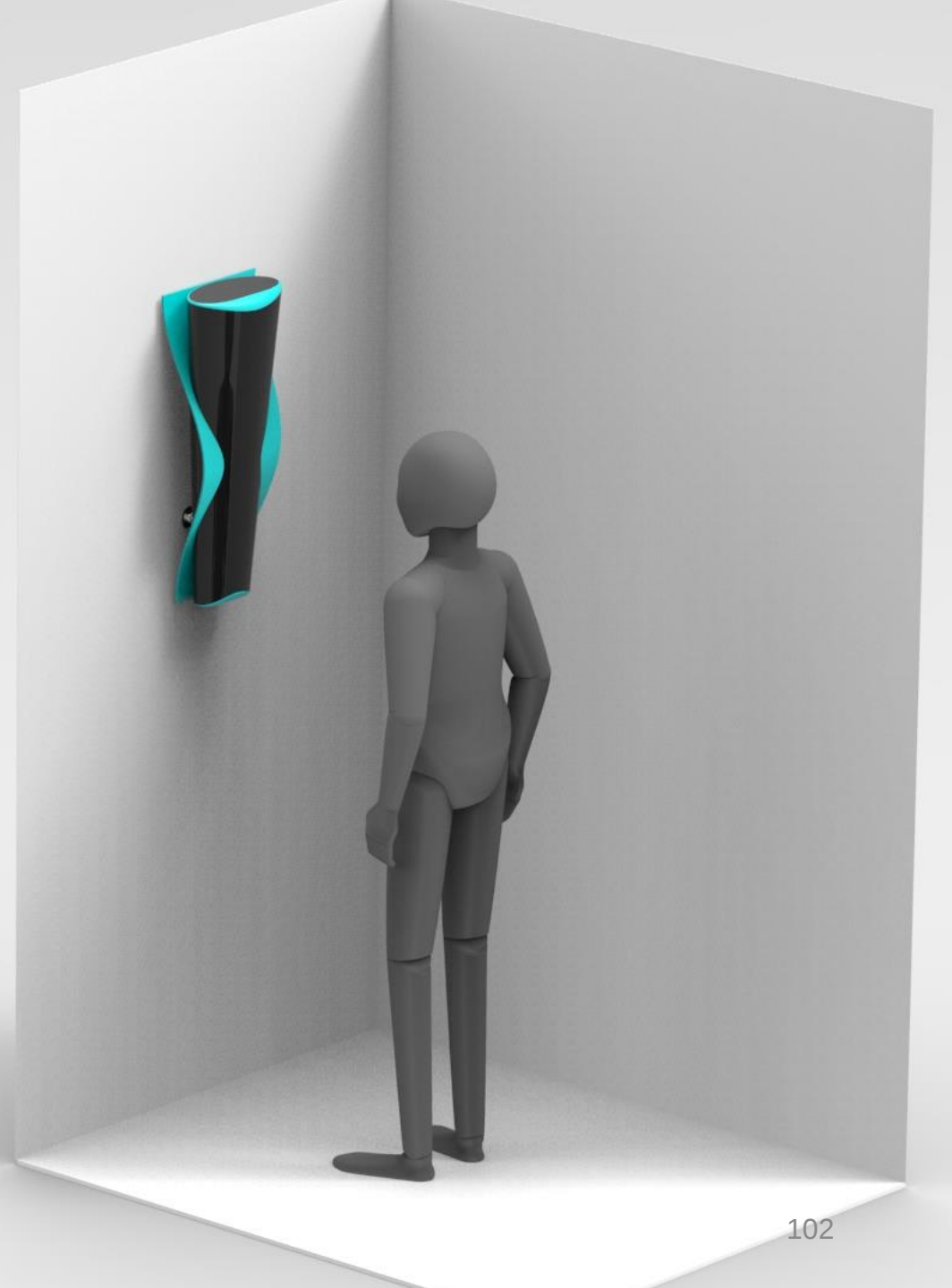


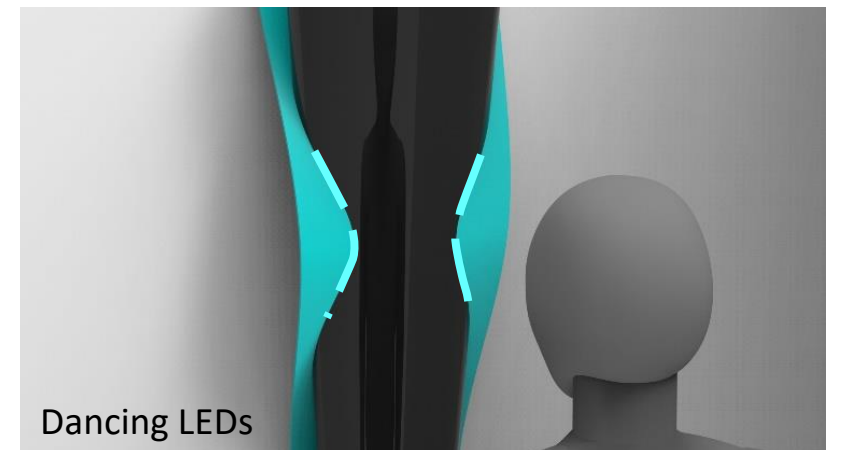
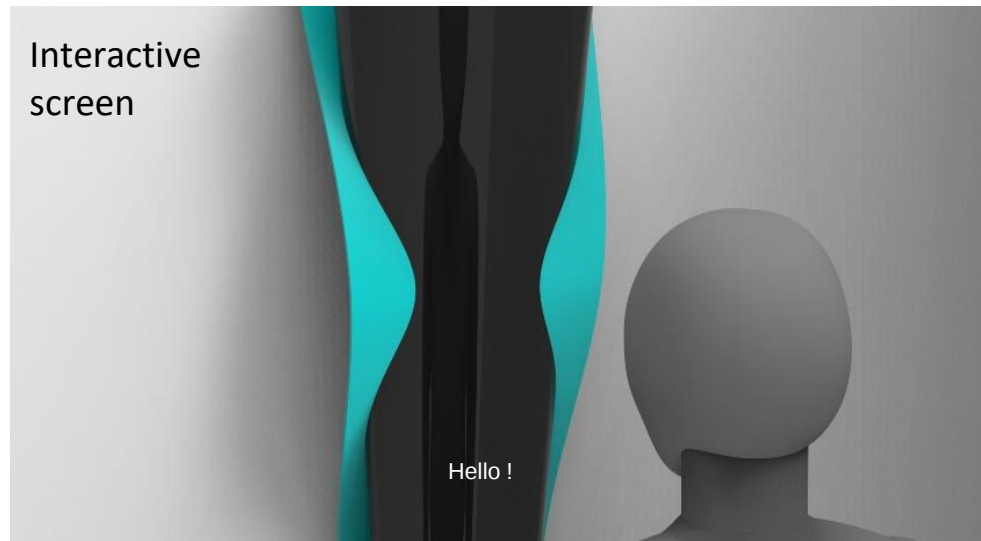
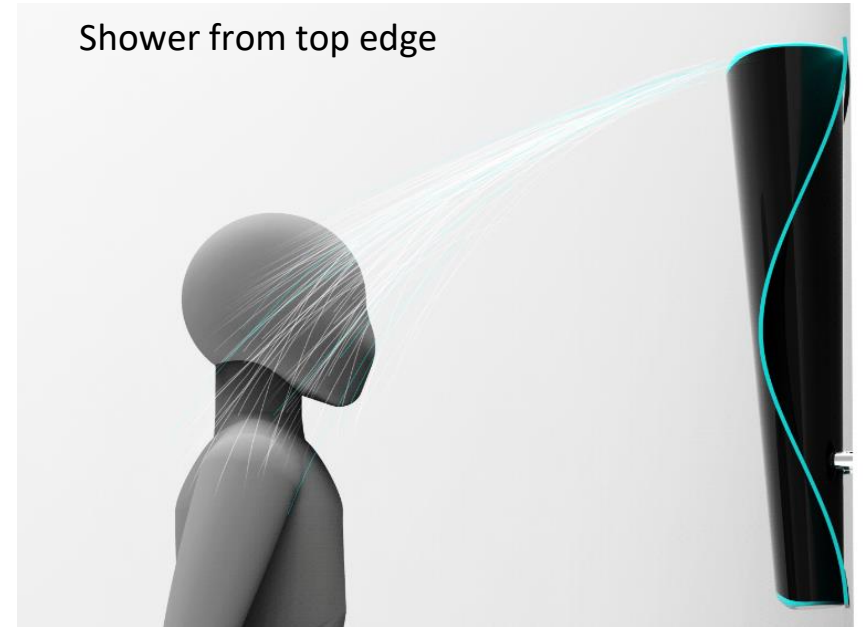
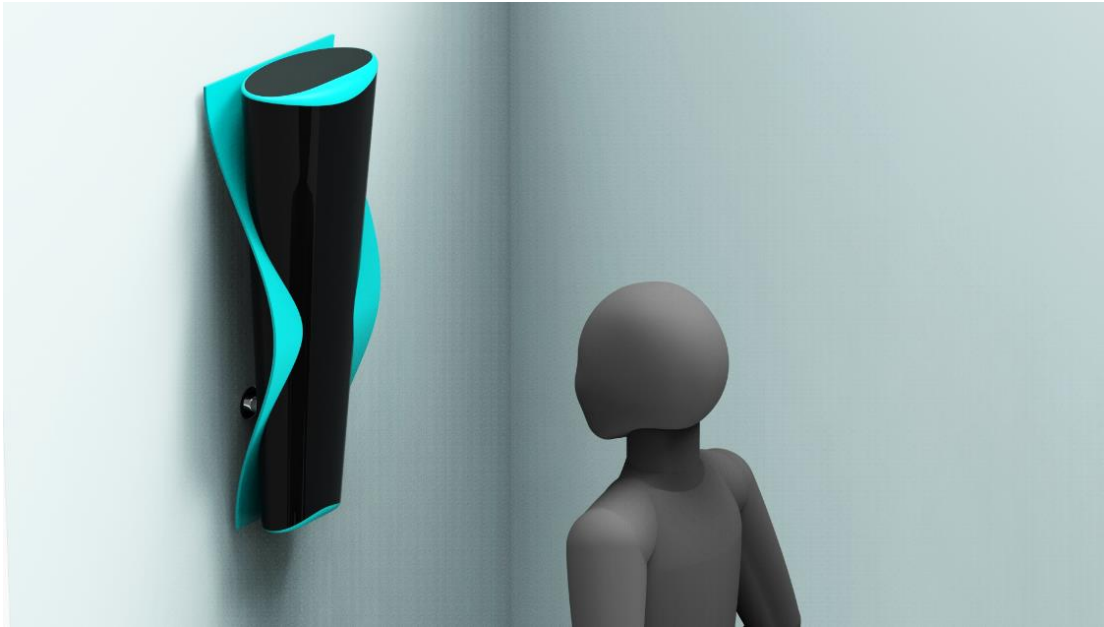


Concept 5

Inspired from Sea Cucumber

The idea was to through some mass out of boring confined volumes and the fluid collar was inspired from the sea cucumber gills to enhance the form.





SWOT ANALYSIS

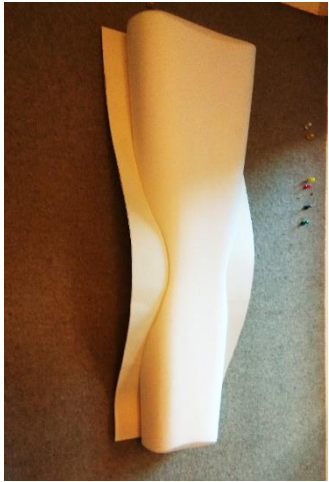
TABLE -2 SWOT ANALYSIS

PARAMETERS	STRENGHT	WEAKNESS	OPPORTUNITY	THREAT
Concept 1	Unique way of space consumption	Mounting factor and exposed screen	Illumination out of huge surface area	Lacks visual security
Concept 2	Minimal and clean form	Looks too slender for vertical orientation	Good distribution of interface is possible	Cleaning accessibility is lacking
Concept 3	Breathing space around the body makes it comfortable visual	Only vertical orientation is possible	Good surface available for projections and display	Sharp converging bottom
Concept 4	Sorted space for electronics is possible	Water exposed to control is most	Expanding and shrinking control bar	Display bar prone to damage
Concept 5	Unconventional formal appeal	Only vertical orientation is possible	Collar has a practical functional aspects to it	Screen in front can get damage if impacted

CONCEPT EVALUATION

Parameters	Concept 1	Concept 2	Concept 3	Concept 4	Concept 5
Form	3	4	3	3	4
Customisability	3	3	3	4	4
Usability	3	4	3	4	4
Manufacturability	4	4	2	3	4
Total	13	15	11	14	16

TABLE -3 CONCEPT EVALUATION



Mock Up
1:1



Intuitive User Response



surprise

FUTURISTIC



novel



Super clean



High-tech



unexpected

SMART



Companion



Easier



Comforting
Pleasant



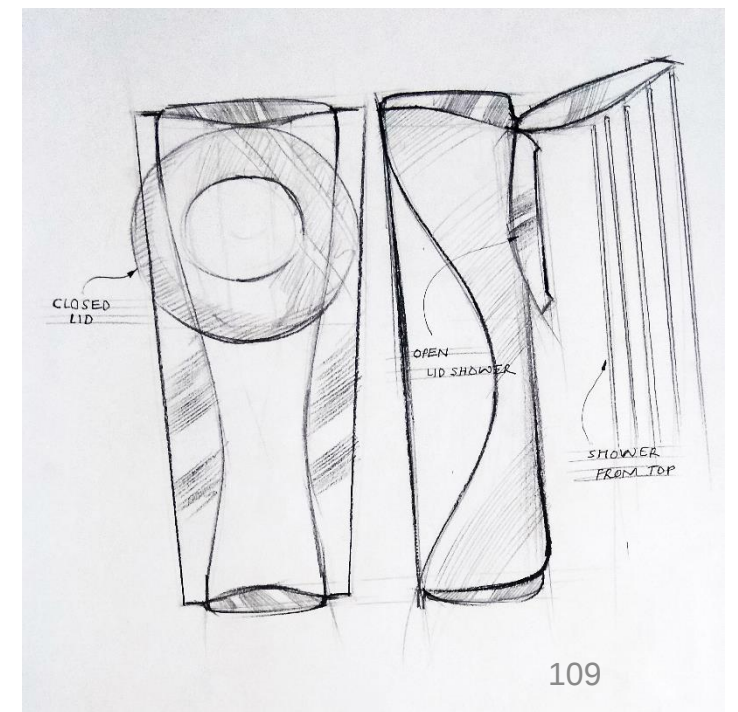
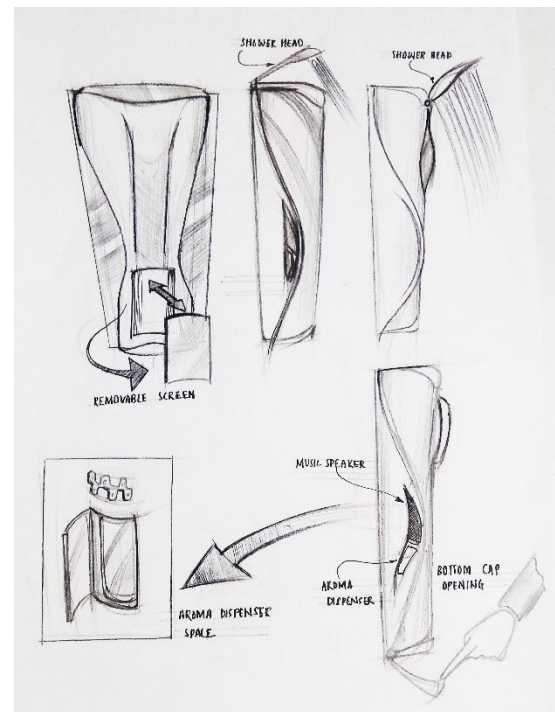
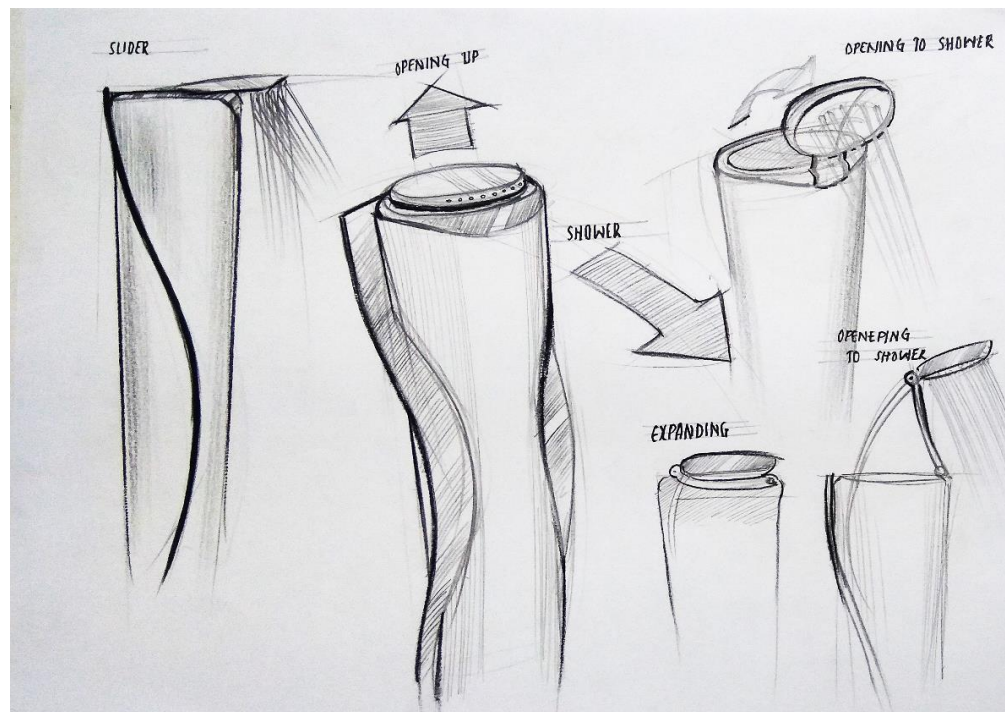
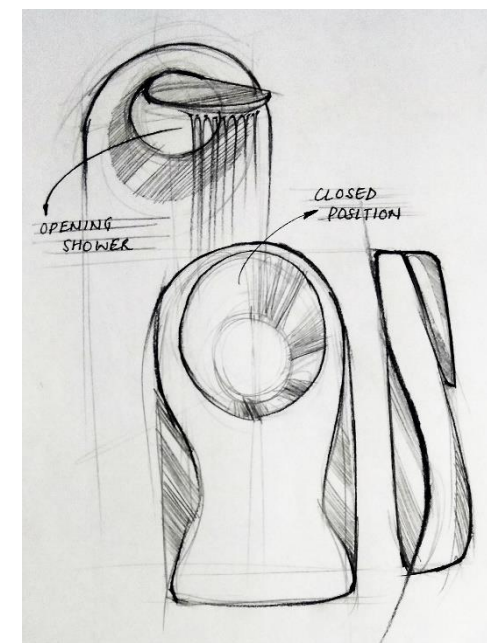
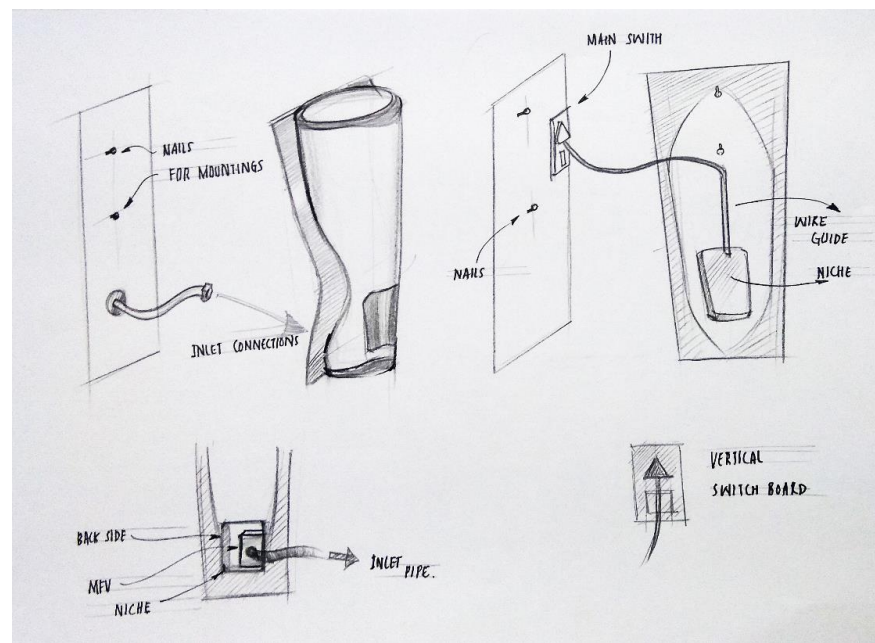
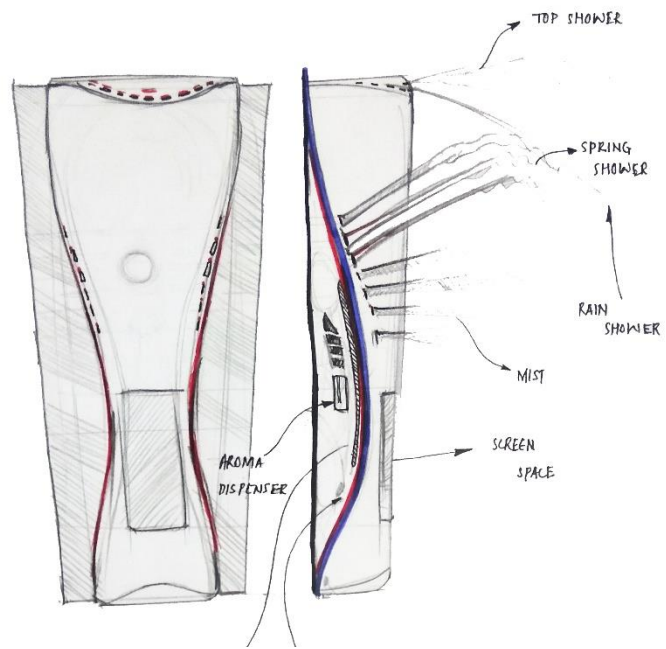
Sorted

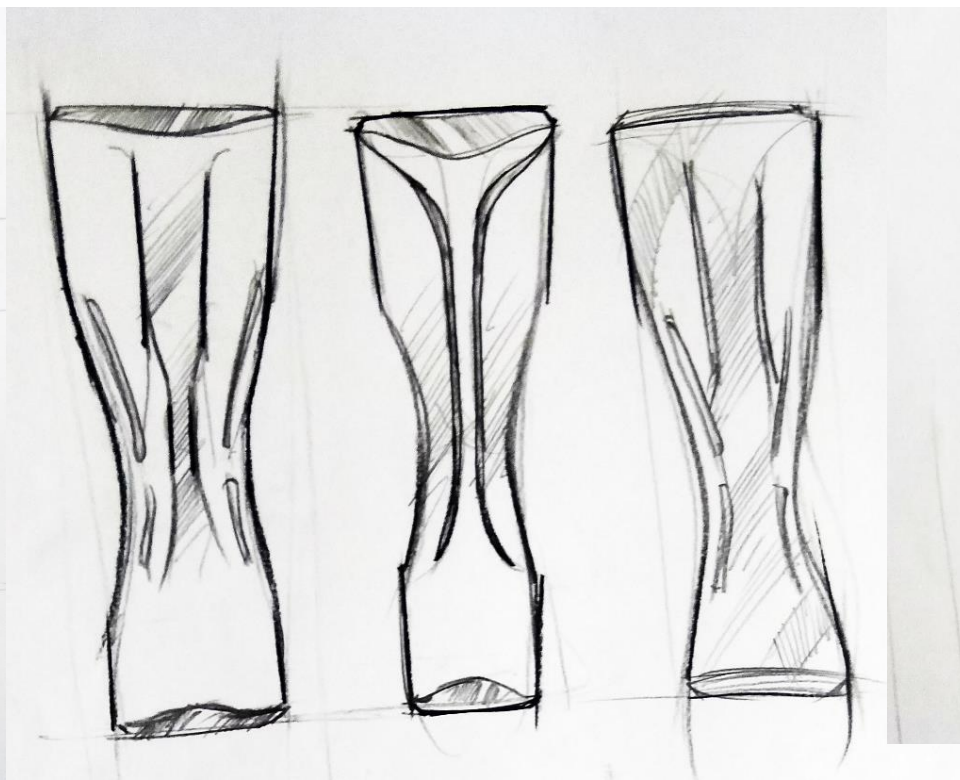
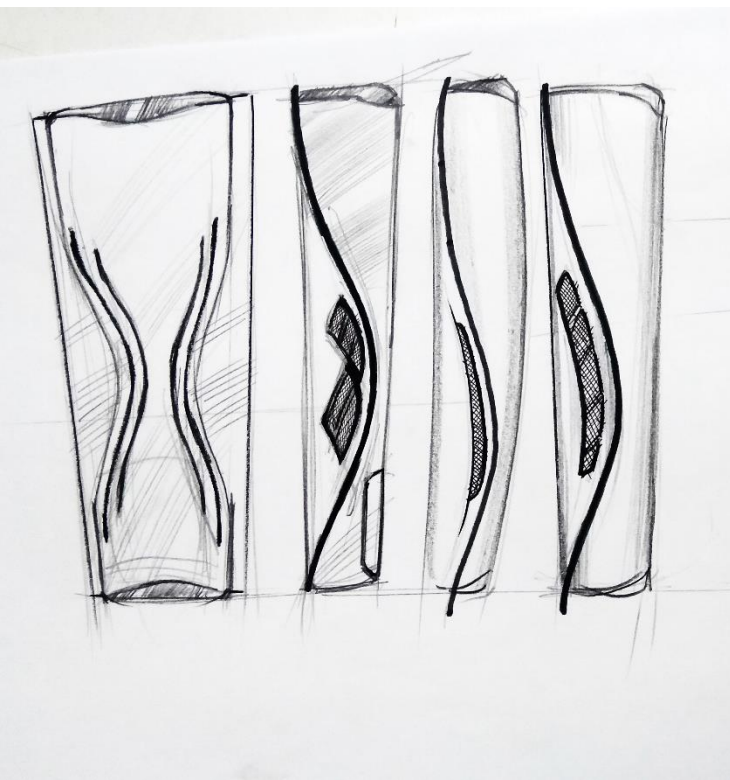


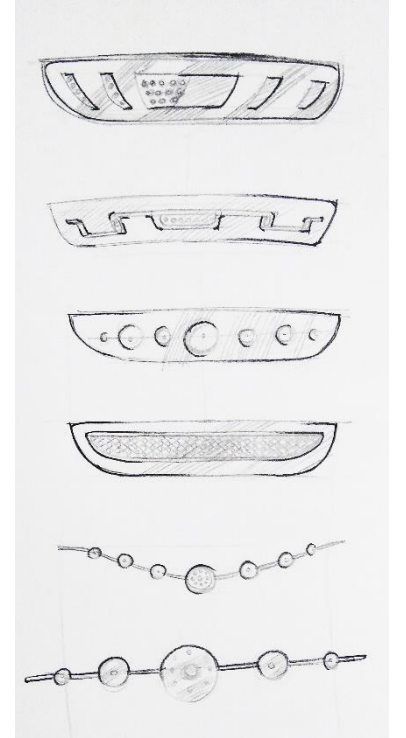
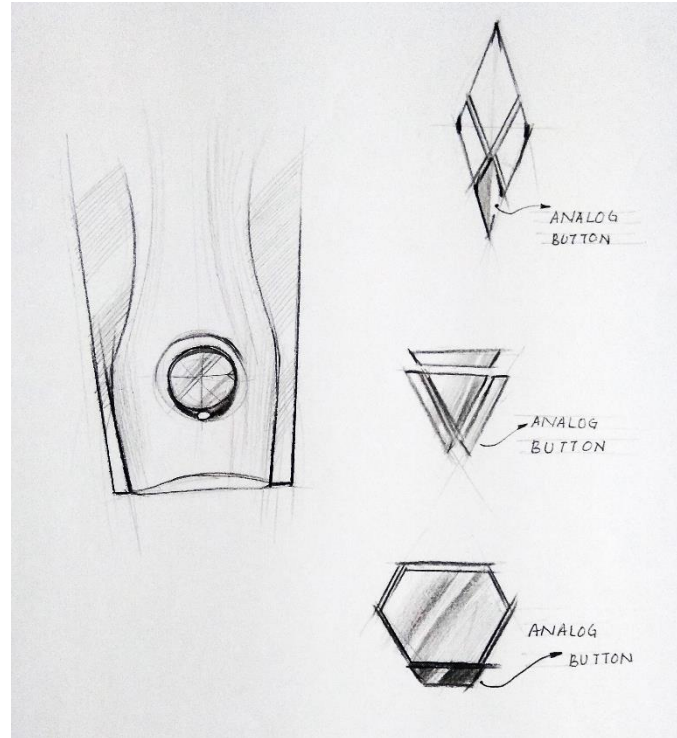
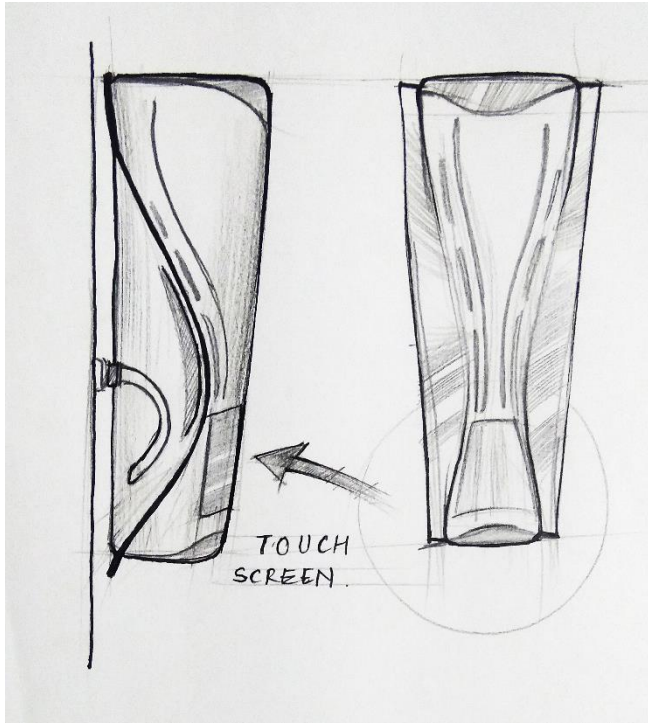
Independent

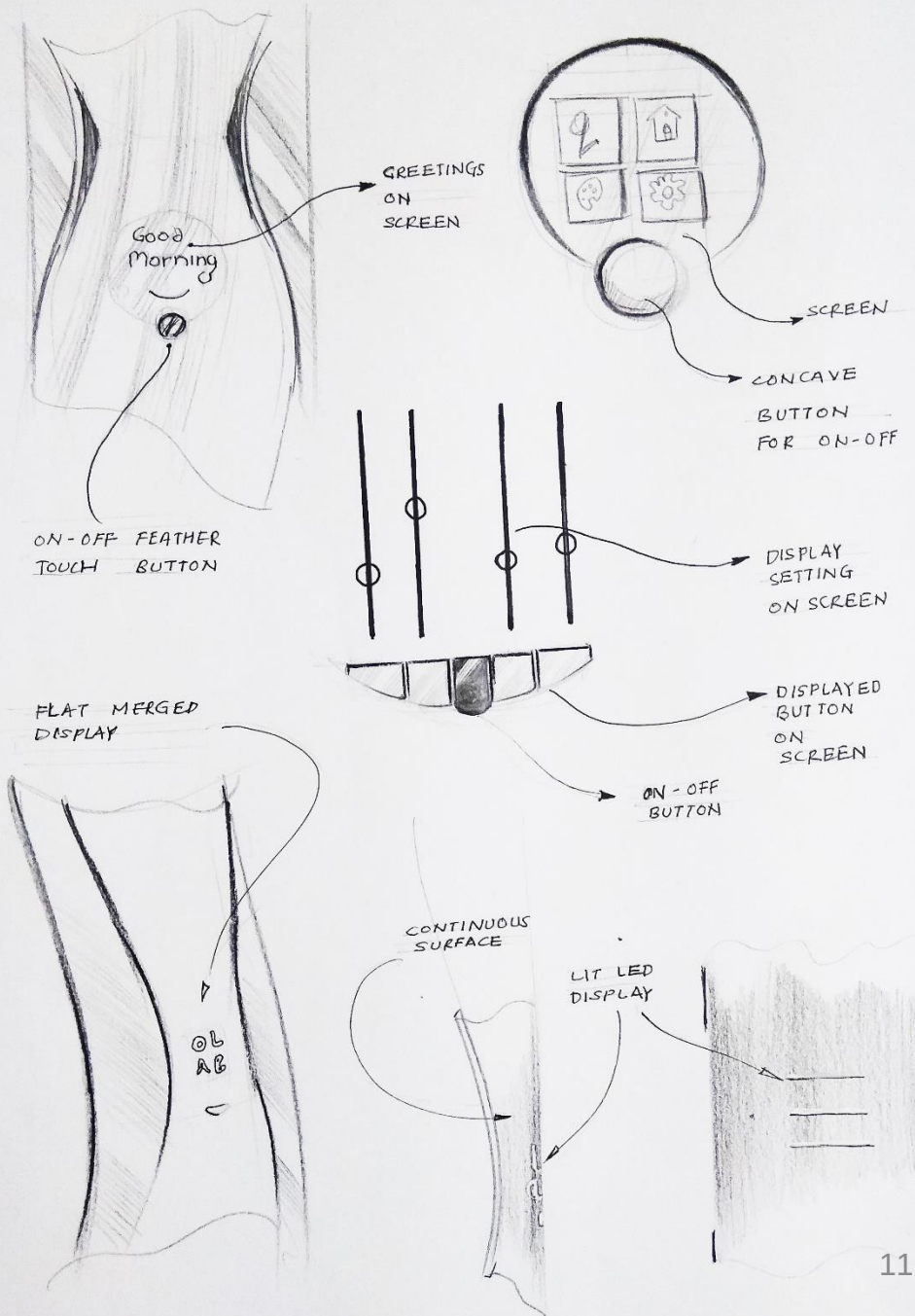
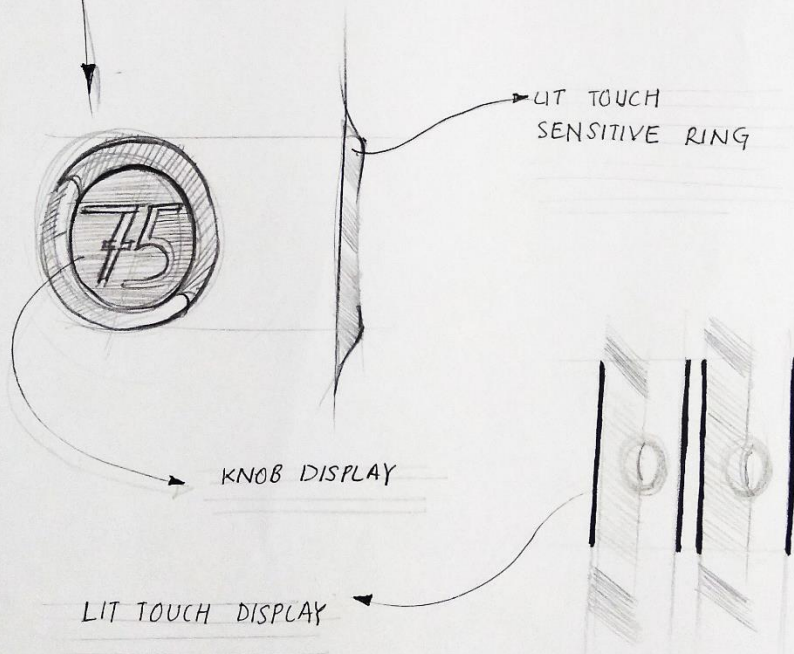
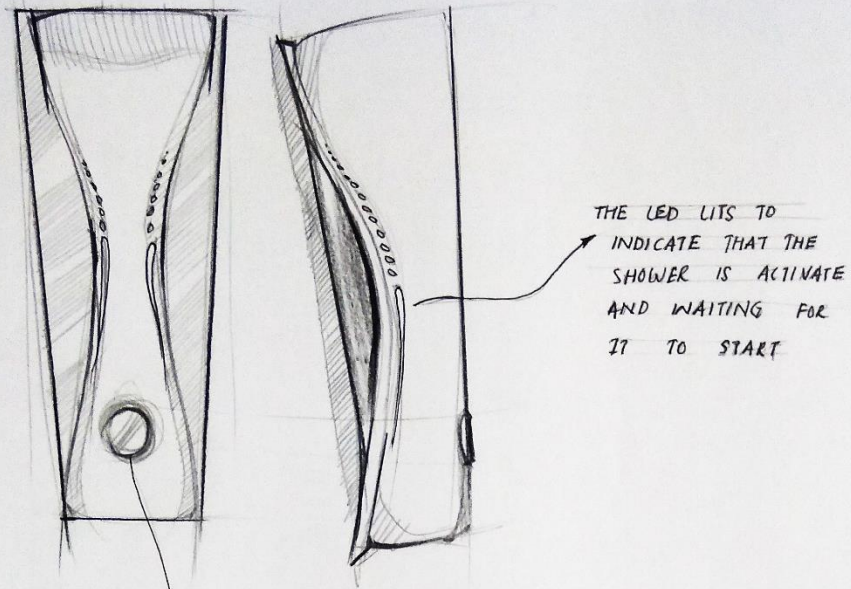


Reliable











Chrome edge statement



Clean intersection



Translucent barrier/cover



Sleek and glossy

AESTHETIC TRENDS



Added transparency making objects visually light



Elegantly lit



Mystical illumination



Bold and strong curves

Textured white with dark rose gold



Metal finish
Travertine pattern



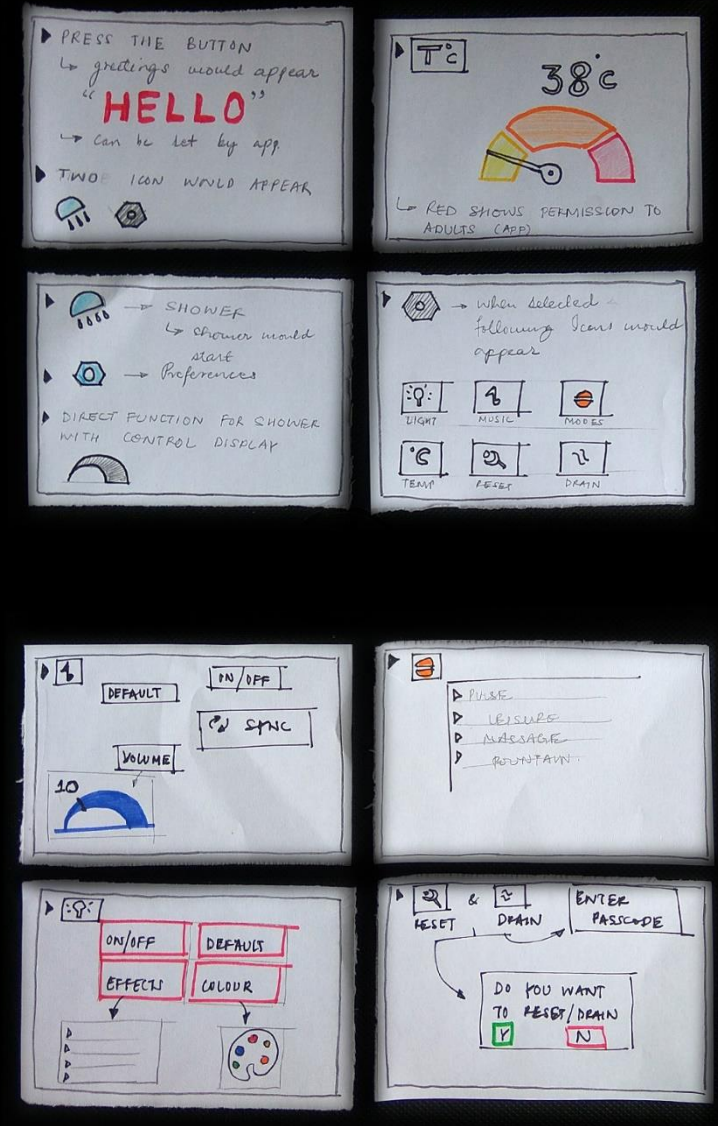
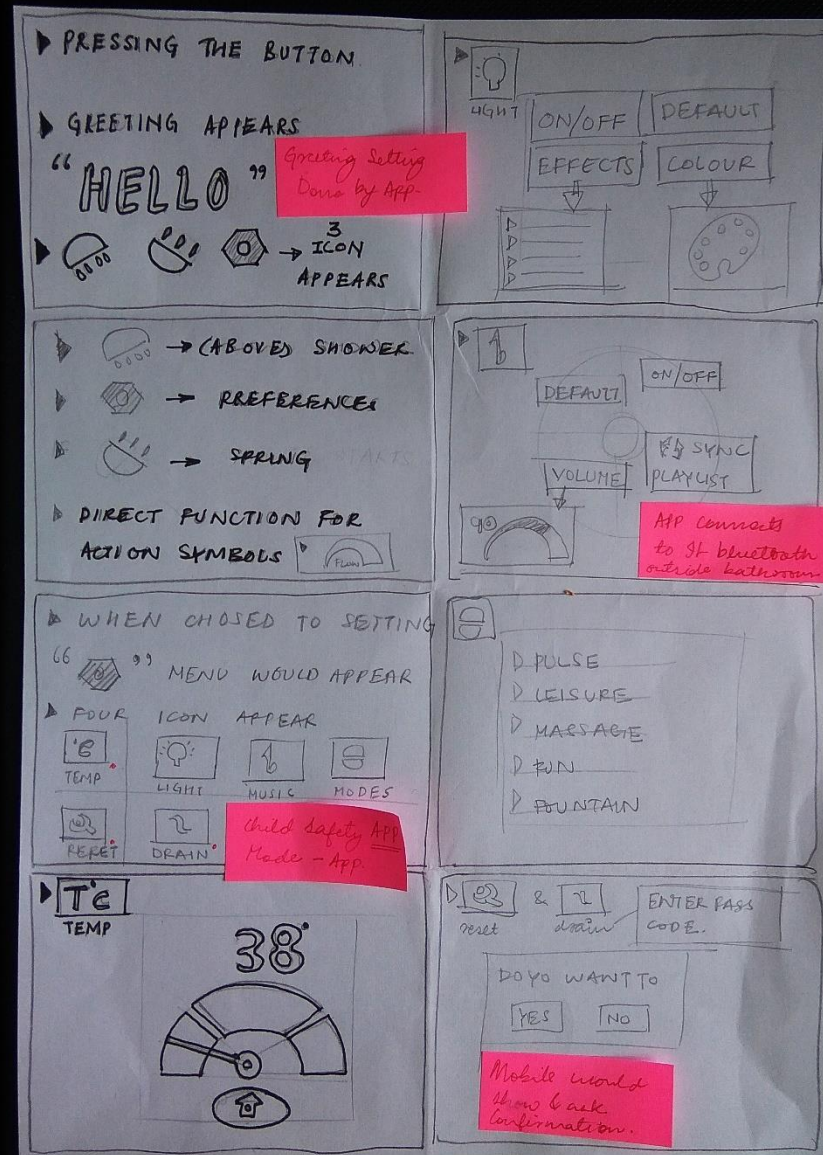


Matte grey
Hard plain white

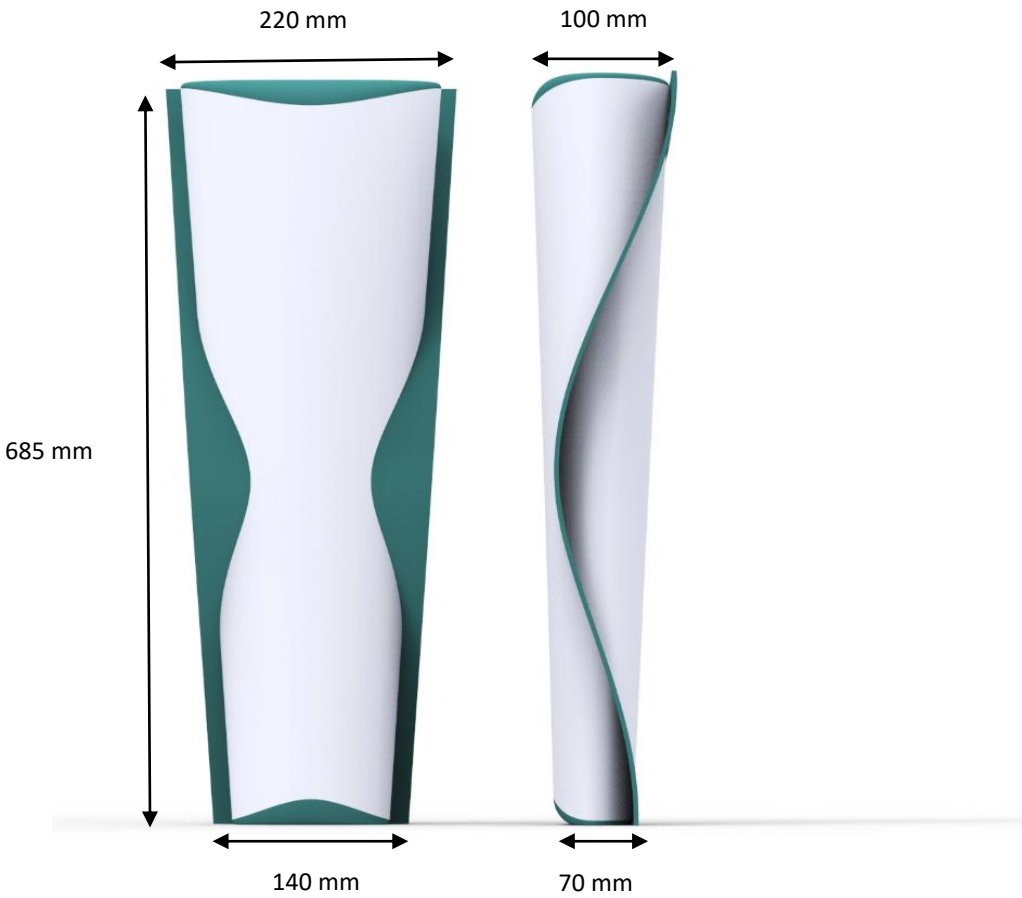
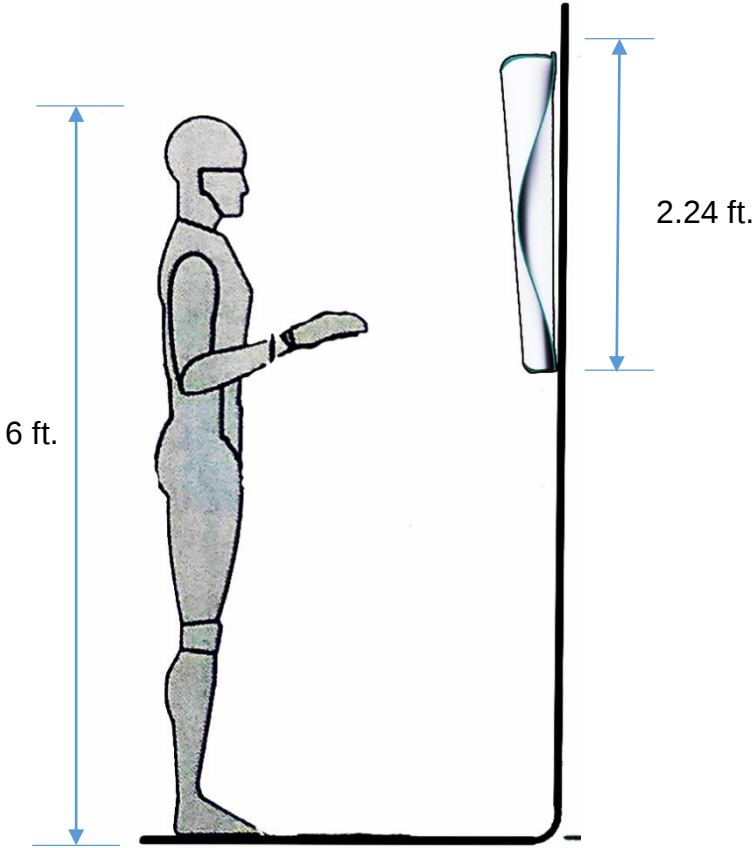
Clean porcelain white
Clear glass



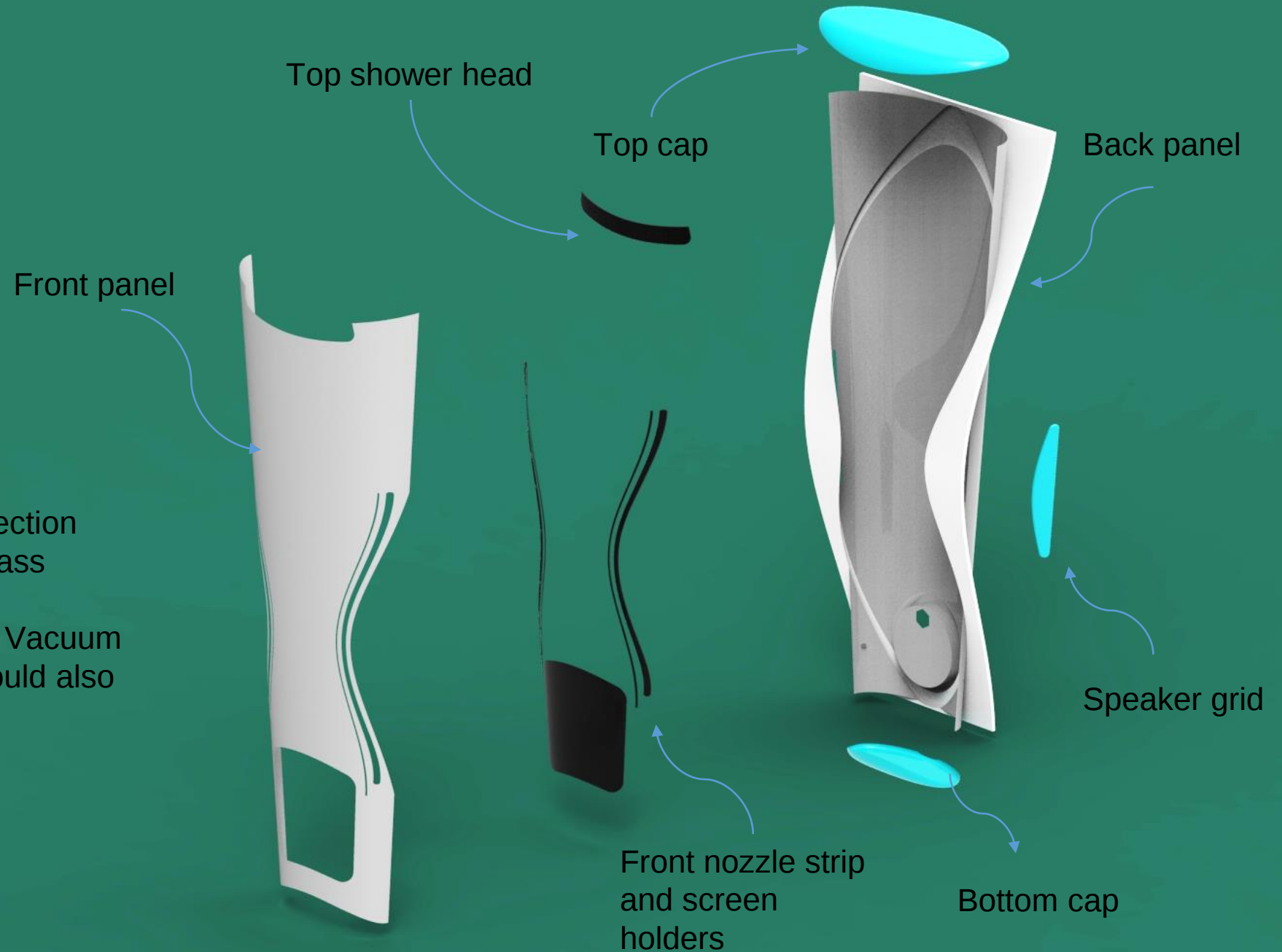
Story boarding & chunking



BASIC
DIMENSIONS

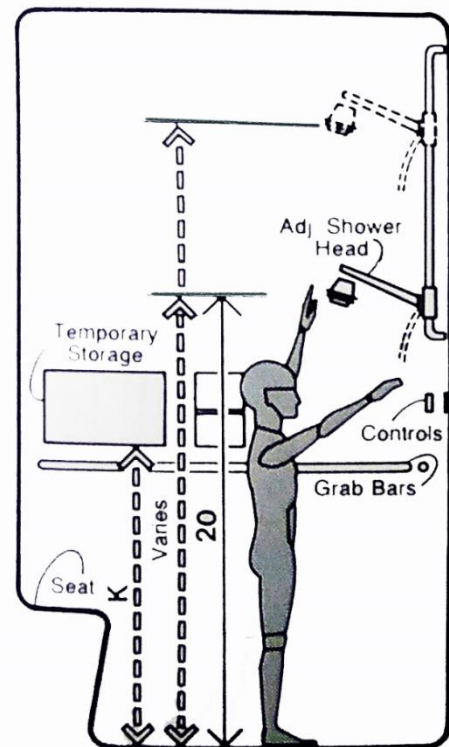


MANUFACTURING

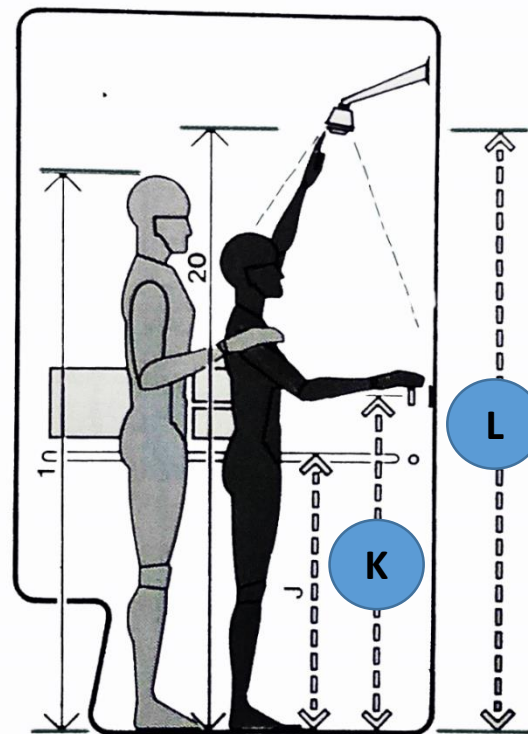


All the parts will be injection moulded in ABS for mass production.
For batch production , Vacuum forming with HDPE would also be a choice

Ergonomics



SHOWER / CHILD
ANTHROPOMETRIC
CONSIDERATIONS



SHOWER / REACH AND
CLEARANCE

	in	cm
A	54	137.2
B	12	30.5
C	42 min.	106.7 min.
D	18	45.7
E	36 min.	91.4 min.
F	30	76.2
G	24	61.0
H	12 min.	30.5 min.
I	15	38.1
J	40-48	101.6-121.9
K	40-50	101.6-127.0
L	72 min.	182.9 min.

Human Dimensions And Interior Space
by Julious Panero and Martin Zelnik
Page no. 165

Thank You