



SOMNIUM

————— Breathe Easy, Sleep Soundly —————

Problem

- Sleep Apnea affects **18 Million Americans**, **50%** of prescribed patients **stop CPAP treatment after the first month.**

- **Affecting an estimated 936 million adults worldwide**, obstructive sleep apnea (OSA) highlights the critical importance of quality sleep.

No matter what you do,
sleep is the number one priority
to recharge and persevere.



What is CPAP?

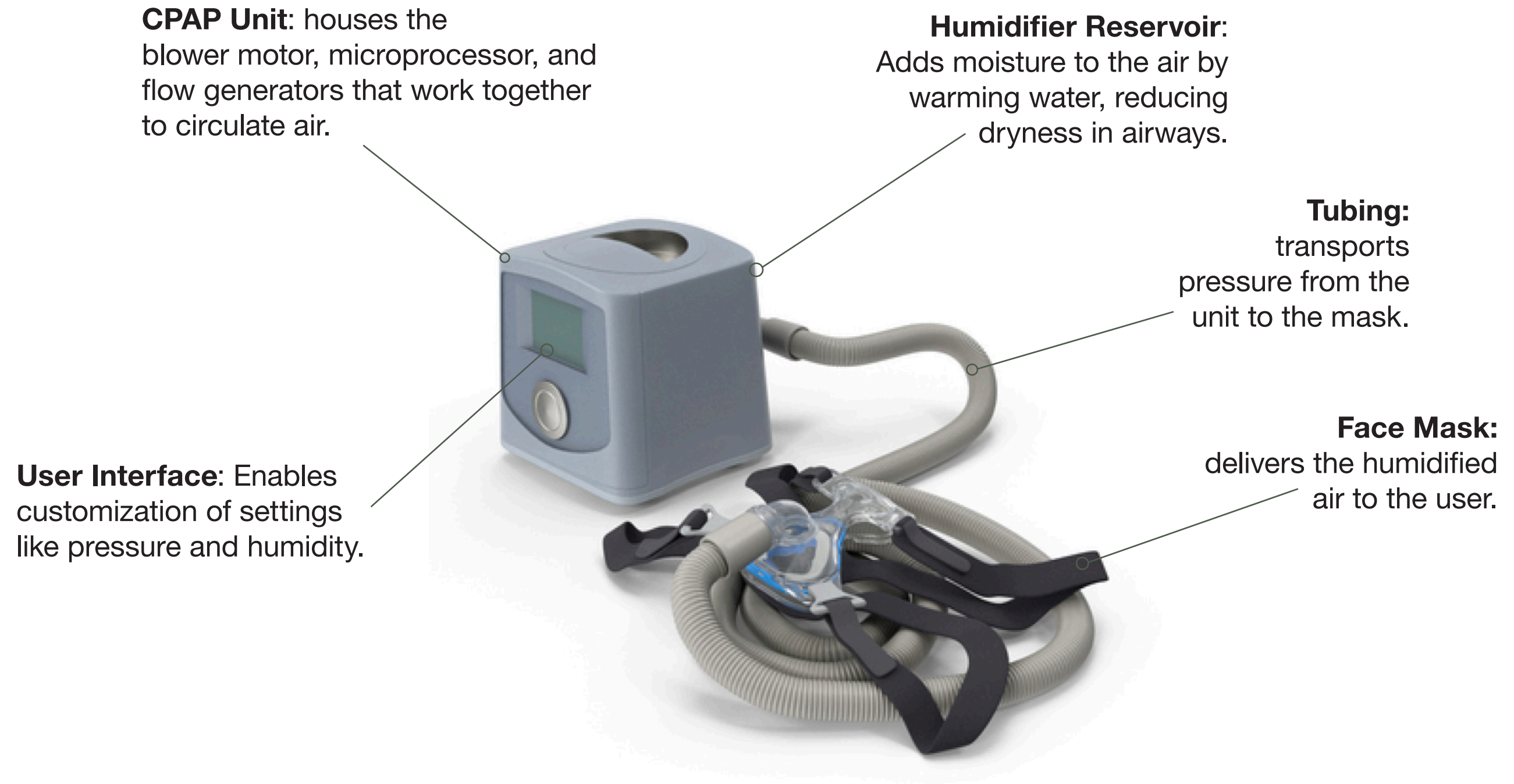
- Continuous Positive Airway Pressure (CPAP) is a **common treatment for sleep apnea**, delivering a steady stream of humidified air through a mask to keep airways open during sleep.
- Benefits include **lower blood pressure, reduced stroke risk, decreased daytime sleepiness, and improved mental health.**

“Around 8 million people nationwide use a CPAP machine.”

- Forbes



Product Breakdown



Despite the amount of features, is there a way to make it **look less medical and bulky?**

CPAP Market

- CPAP machines on the market are bulky and take up a lot of space. When they don't they **sacrifice many beneficial components** to save space.
- The small interfaces can be difficult to read for older users.



Airing Micro CPAP - \$30

- Pros:*
- Eliminates the need of side unit.
 - Hoseless.
 - **Discreet design.**

- Cons:*
- Skepticism in actual effectiveness.
 - Falls out of the nose easily.
 - No humidification.
 - Noisy.



R100 Auto CPAP - \$369

- Humidity level adjustment.
- **Portable.**
- Budget friendly.

- Lack of finishes.
- Overall quality.
- Difficult to understand.
- Lacks a built in humidifier.



Apex XT Auto CPAP - \$770

- **Heated humidifier.**
- Auto adjusts air pressure.
- Quiet.
- Built-in power supply.

- Very unsightly
- Need a prescription to own.
- Old school display.
- Data downloadable via USB.



ResMed AirMini Travel CPAP Machine - \$920

- Great for travel.
- No need to fill with water.
- **Mobile app.**
- AutoSet Algorithm.

- Noisy, due to size.
- Waterless humidification.
- Limited compatibility with existing products.
- Lack of tailored treatment.



Resmed Airsense 11 - \$1,044

- Best overall CPAP.
- Easier to navigate touch screen.
- **Automatically adjusts to your breathing patterns.**

- Very bulky / heavy.
- Takes up a lot of usable space.
- Looks very much like a medical device.
- Expensive.

Nasal CPAP Masks

- Traditional nasal masks for CPAP machines are **sold separately**.
- They are **bulky, uncomfortable**, and feature a **large hose** that comes out the front, **discouraging consistent use** despite their health benefits.

There should be a way to emphasize the **need for more discreet, comfortable, and user-friendly solutions**.



Research



Jennifer - 55
Project Manager

- Suffered from a deviated septum and years of snoring, and would get horrible sleep.
- Losing such a huge aspect of your natural cycle takes a greater toll on a person than one might think.

*“There were some nights where I would only get an **hour of overall sleep...**”*

Having a CPAP has increased her energy and removed her snoring all together while being used.



Dr. Kumar - 56
Sleep Specialist

- Specializes in sleep medicine, and has co-published multiple articles about OSA and its effects on the human body.
- Dr. Kumar prescribed the CPAP machine to Jennifer after her surgery.
- Described the steps of acquiring and maintaining a CPAP Machine for regular use.
- Most CPAP Machines **have to be prescribed** for use by a patient suffering from OSA.

Outside Sources

- Some have to **modify surrounding furniture** to accomodate the machine, and its unwieldy hose.
- Made from **hard plastics** that dig into your skin overnight, leaving you with marks on your face when you wake up.
- Overall **major discomfort** and complaints about current designs.
- *“You must buy new hose and humidifier tank every 3 months. As well as a new nose piece every month, which’ll run you about **\$200 all together.**”*

Despite sleep apnea being such a global issue, most CPAP machines have to be **prescribed** for patient use.

Observation



1. After a night of use the user has to remove and clean the water reservoir. Any left over water from the previous use has to go.



2. Doing so makes sure that no bacteria is able to accumulate and enter the user's airways.



3. **Before every use**, the CPAP machine is **filled back up** to last through the duration of its use.



4. The reservoir is inserted into the side of the machine.



5. The machine is activated by the button on the top. The unit also contains a touch screen interface that displays vital information.



6. The CPAP hose plugs into the unit and the nose piece, making for a less than ideal aesthetic. The chip **transfers data** to the microprocessor.



7. Nasal mask pillow fits around the nose. The strap is placed around the head and rests above the ears.



8. UI displays **time used**, **air leakage**, and **sleep score rating**. This information is also accessible via a **smartphone app**.

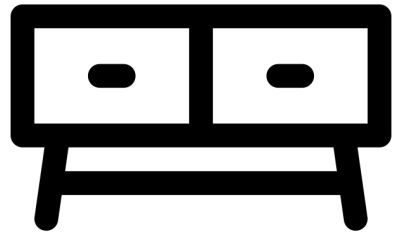
Insights

- Despite how common CPAP machines are, they are often **unsightly, bulky,** and **resemble medical devices**, making them embarrassing to display.
- Additionally, there are **no ways to store the mask or the hose.**
- Essential features to consider include humidity to **prevent throat dryness** and heating to **ensure comfortable, warm airflow.**



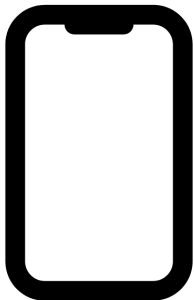
How can we design a CPAP machine that integrates more naturally into the home?

Criteria



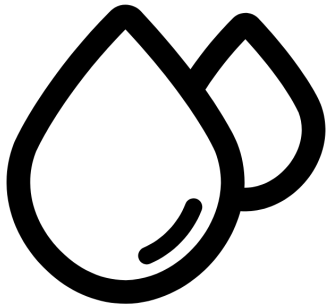
Less Invasive

More appealing to wear.



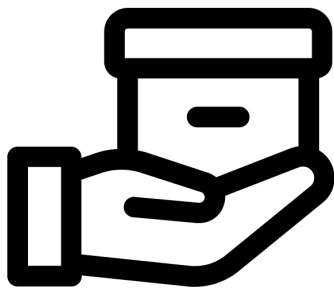
Smartphone control

Remove interface?



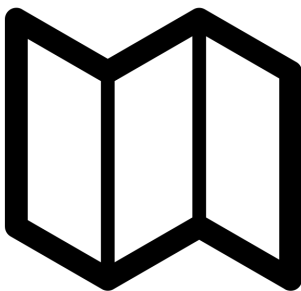
Easy to clean

Machine Washable?
Disinfect?



Portability

Modular



Ease of navigation

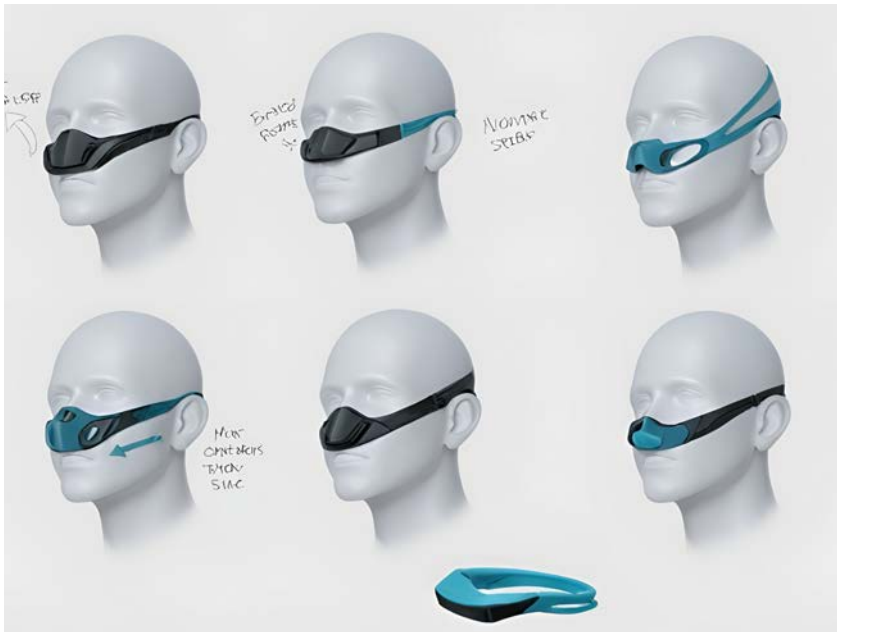
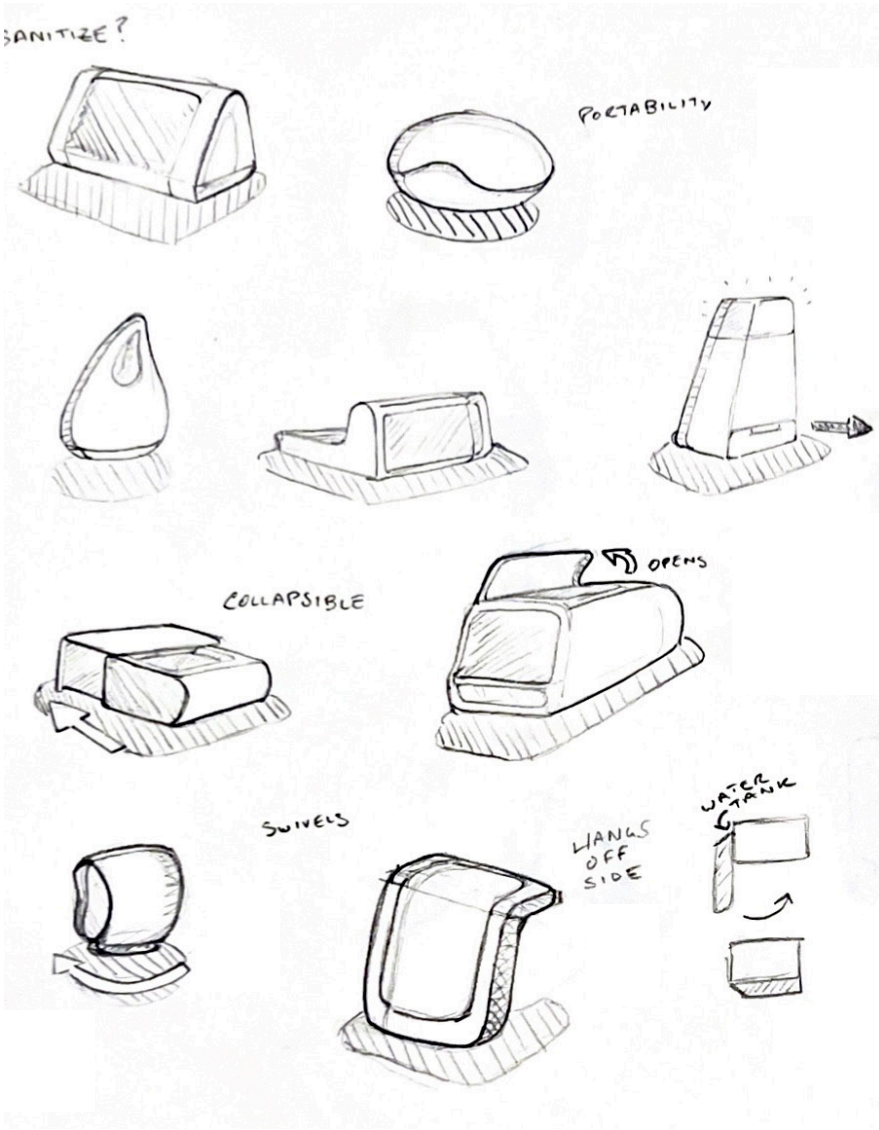


Comfort

Gel Foam insert?

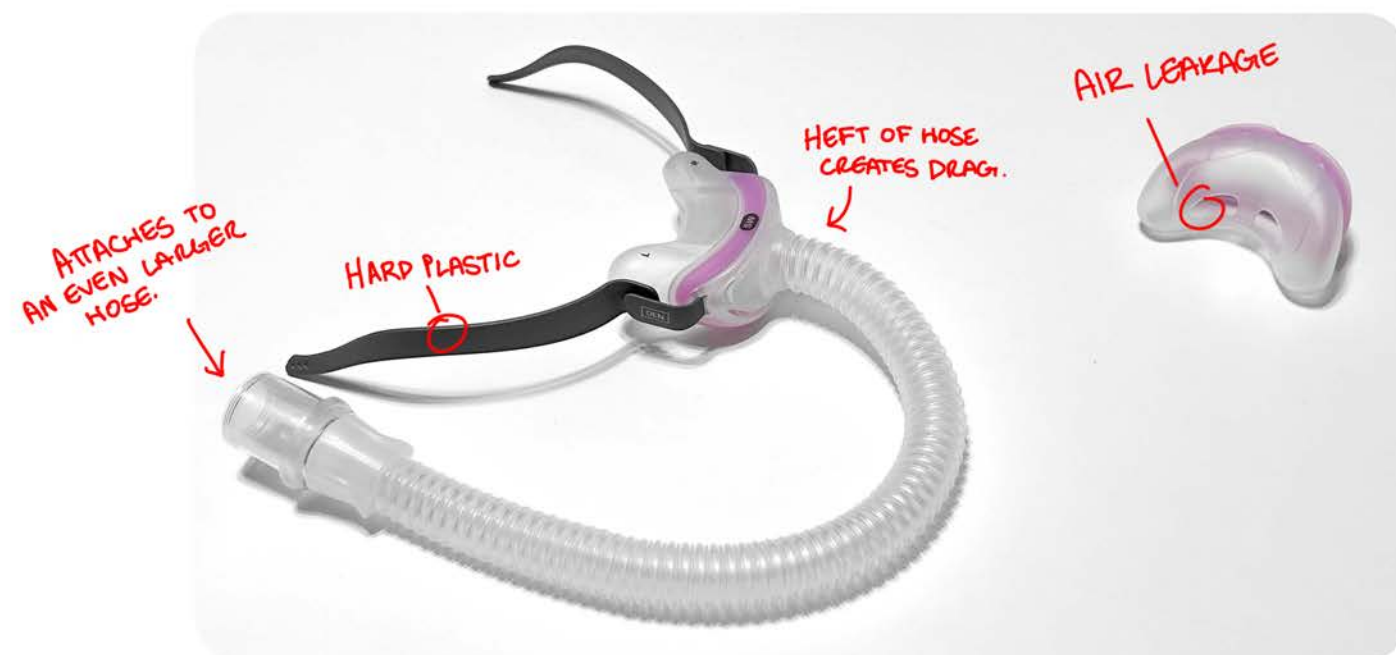
Concepts

- In this two-part design, I began to focus on the unit, and figure out a way to **stay off the nightstand**.
- Focus on a nasal mask that has CPAP capabilities, but is also able to have a more of-age design.



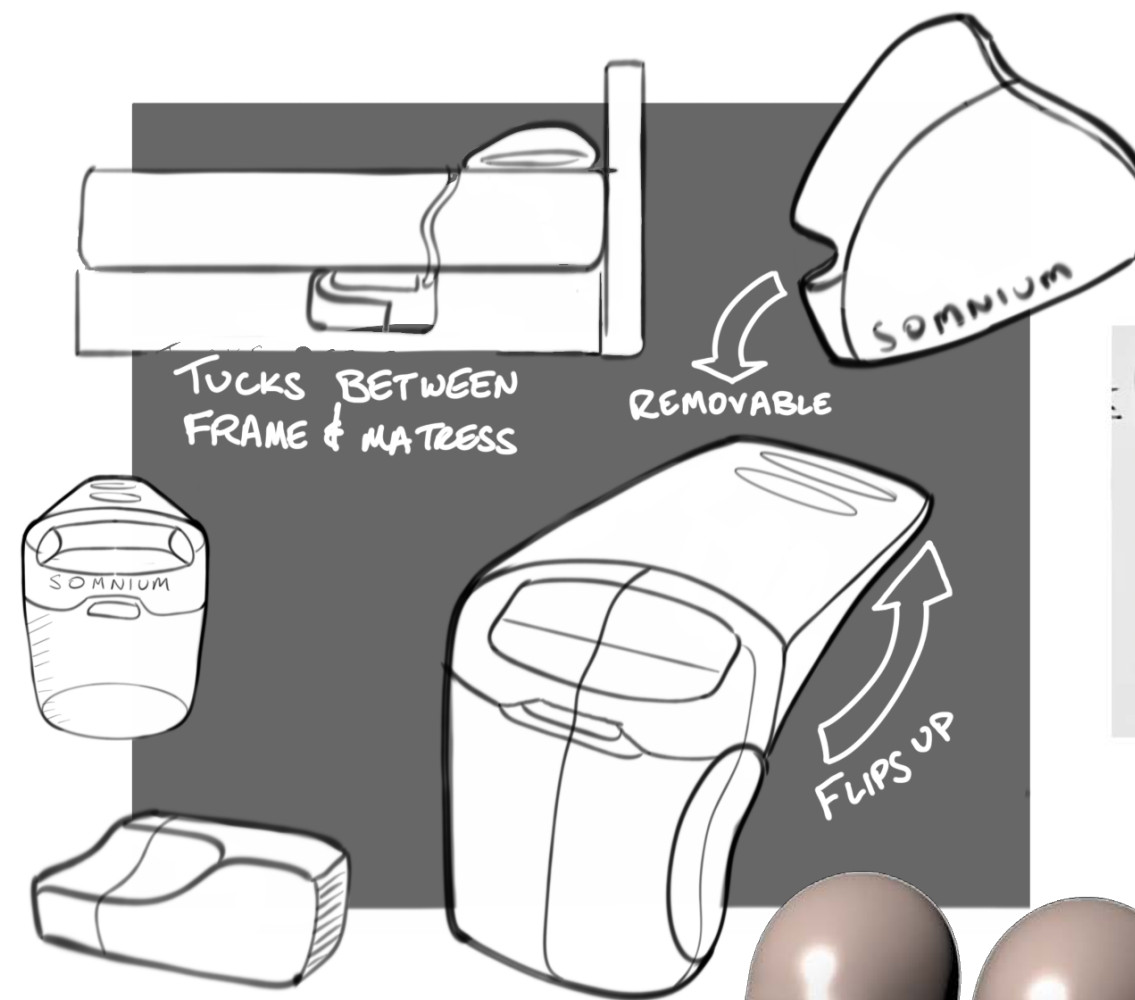
Prototyping

- Understanding an existing CPAP nasal mask.
- Is there a way to **change the way the hose enters/interacts** with the mask, to make for a more comfortable sleep?

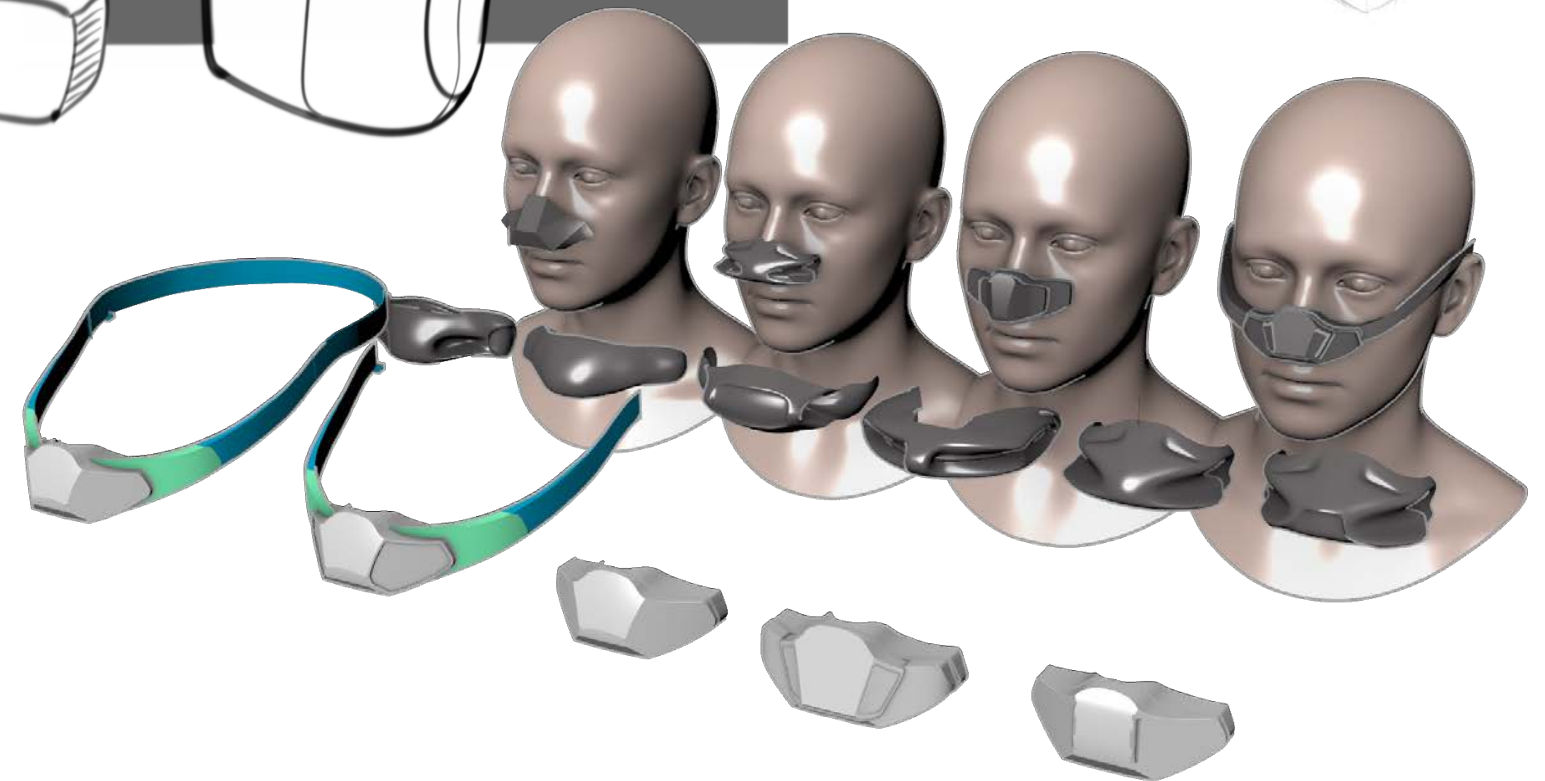


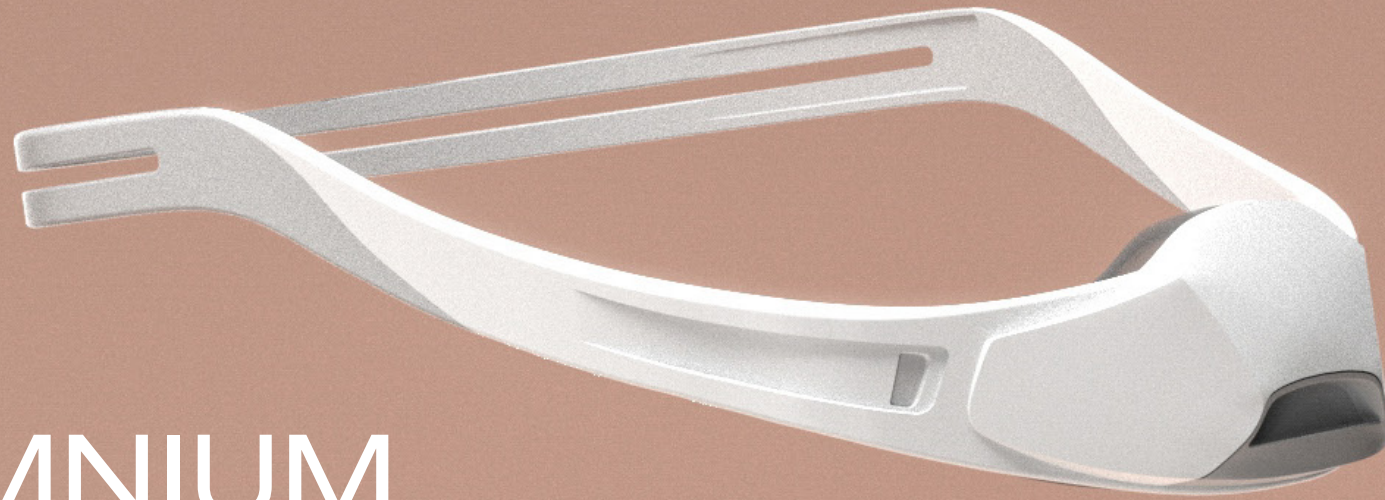
Breakthrough

- The CPAP will be able to slide in between the mattress and the bed frame, **hanging off the side of the bed.**



- Followed by a mask that will not only look sleek, but will have a **new way of implementing and administering CPAP technology.**





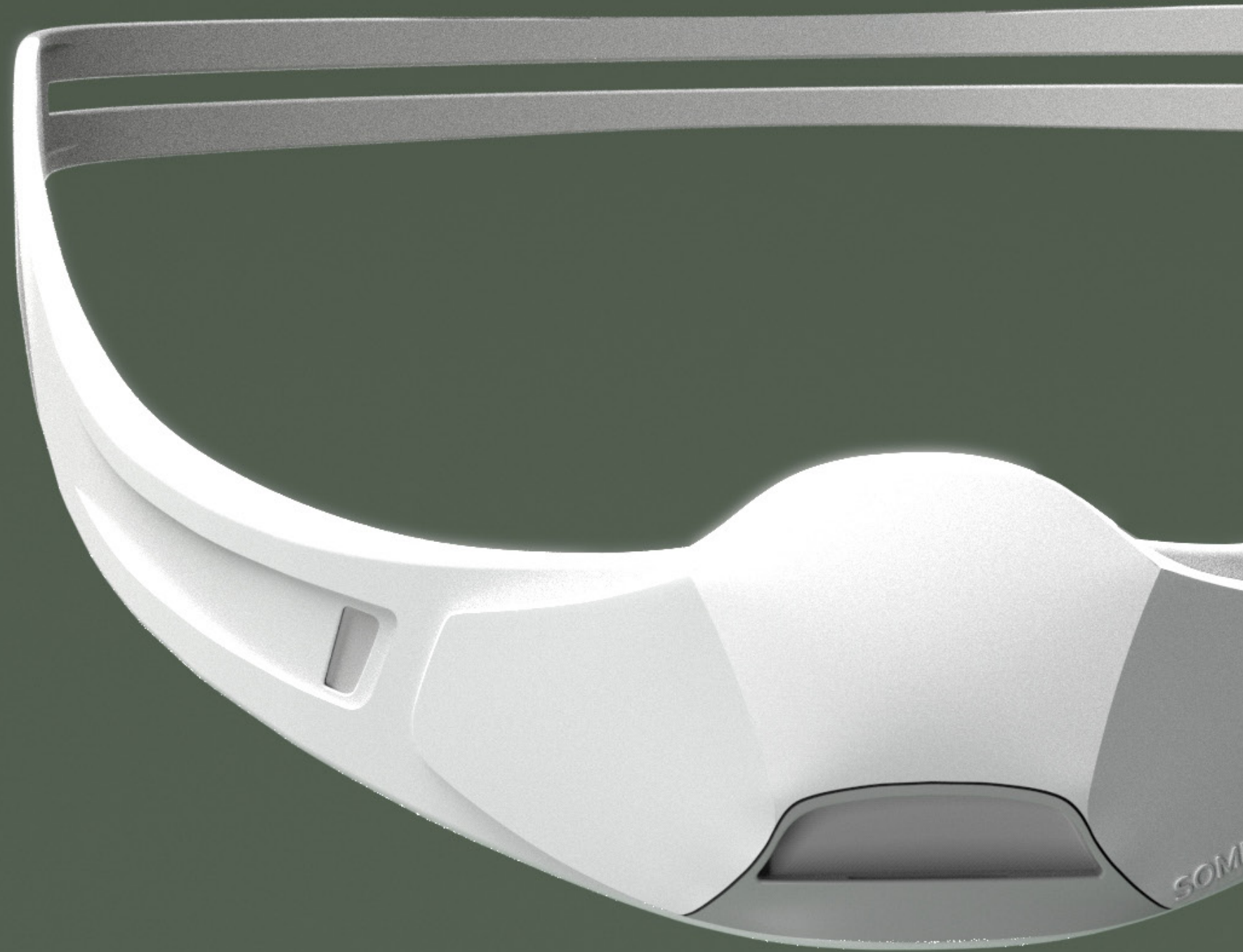
SOMNIUM

BREATHE EASY, SLEEP SOUNDLY

- A **less-invasive CPAP solution** featuring a cushioned nasal mask for comfort and a bedside unit that **automatically adjusts airflow** for optimal sleep.
- Somnium connects to your smartphone to **monitor sleep quality, track sleep goals, and share data** directly with your doctor, making sleep management seamless and effective.



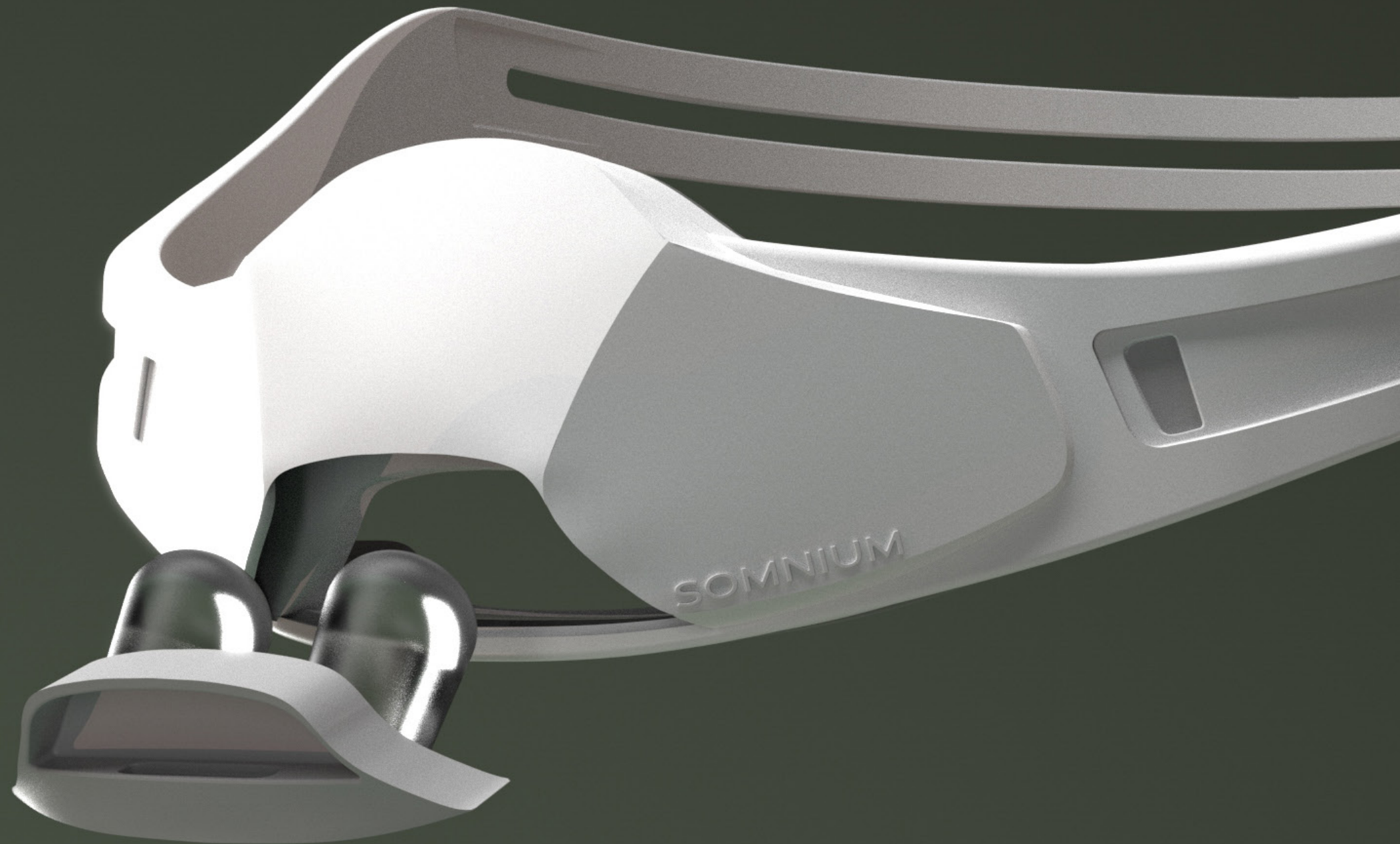
Nasal Mask



- Engineered for comfort, Somnium features a **replaceable nose piece** accessible from the front of the mask and is designed to **eliminate pressure points** common in traditional masks.
- Diffuser vents **minimize noise** and deliver **gentler airflow**, ensuring a quiet and comfortable sleep therapy experience.

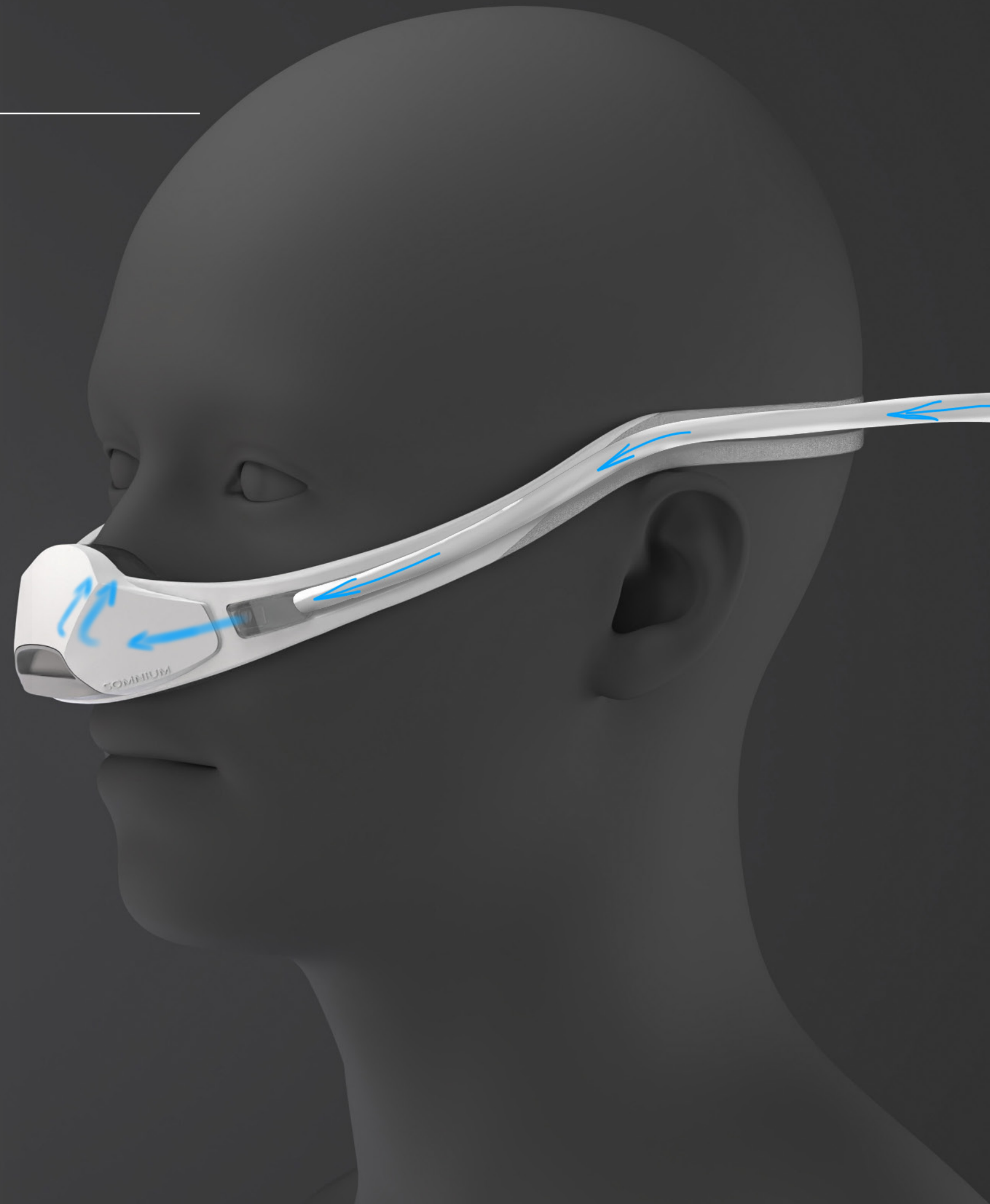
Within the Details

- Replacable gel foam nose cushion.
- Washable elastic headband.
- Removable nose piece.



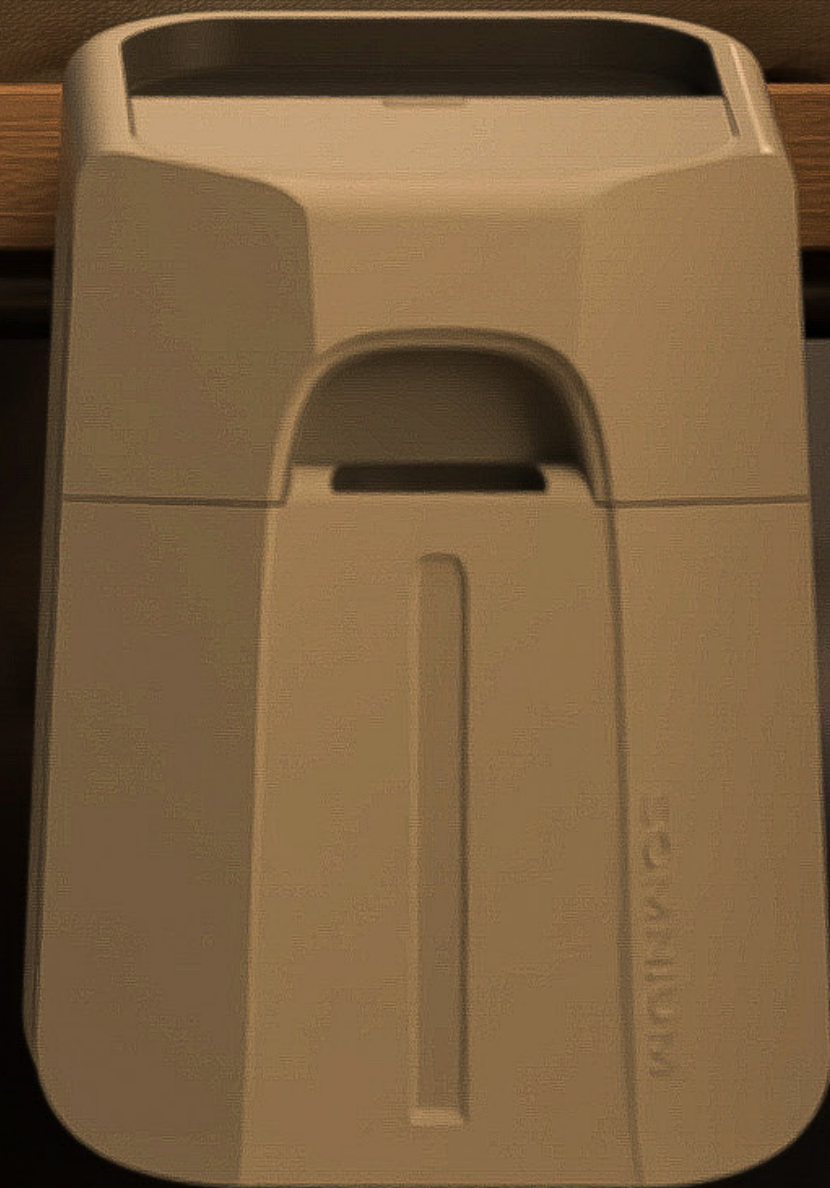
Connecting the Hose

- Somnium features a **smaller diameter, less-invasive hose** that connects to either side of the face, based on preference.
- Its hose adapter clips into the mask, housing a microprocessor that **transmits sleep data to your smartphone**.
- The door on either side opens with airflow pressure, directing air through the nasal cushion for a tailored, and effective sleep.



The Unit

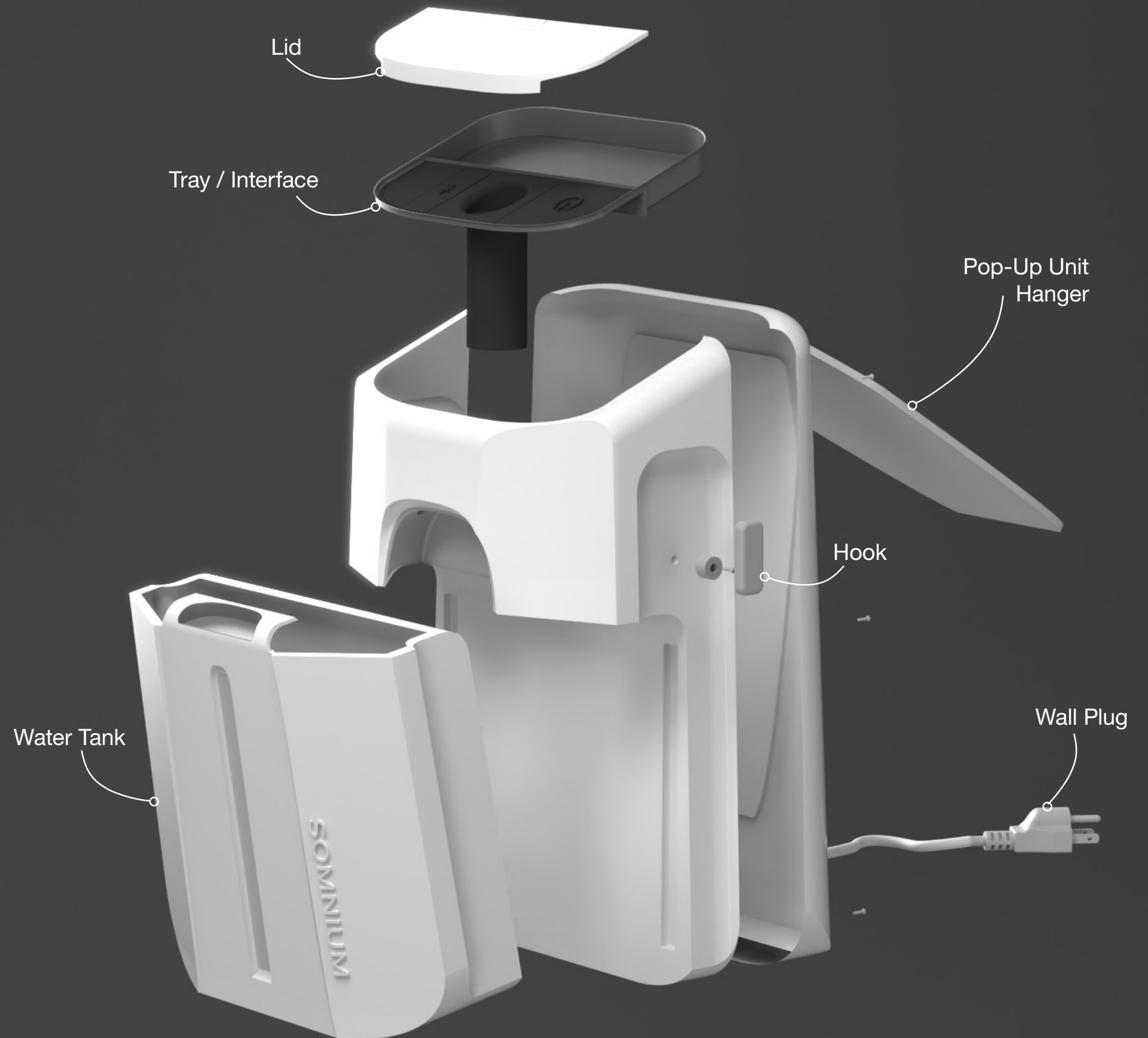
- Connects to your smartphone via Bluetooth, for real-time monitoring and control.
- With advanced noise reduction and adaptive humidity adjustment, it **eliminates the need for bulky water tanks** by providing precise moisture levels throughout the night.
- Its **rear flip-up hanger** slides between the mattress and bed frame for **discreet and convenient use**.



Breakdown

- The main casing is made from Acrylonitrile Butadiene Styrene (**ABS**).

- **Recycled Polypropylene** is ideal for sterile environments, such as inside the humidifier reservoir.

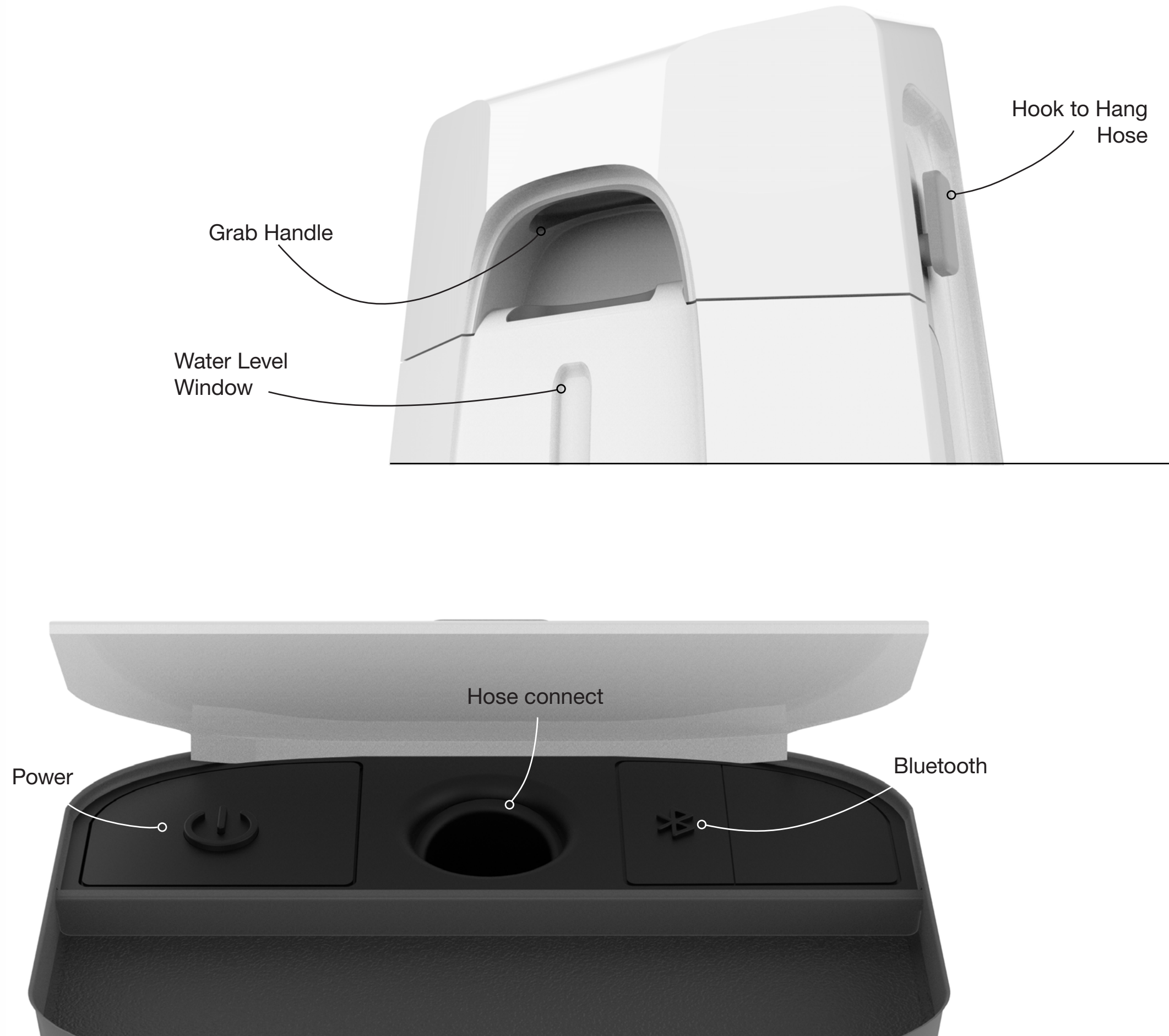


A Deeper Look

- Somnium seamlessly blends both style and functionality.

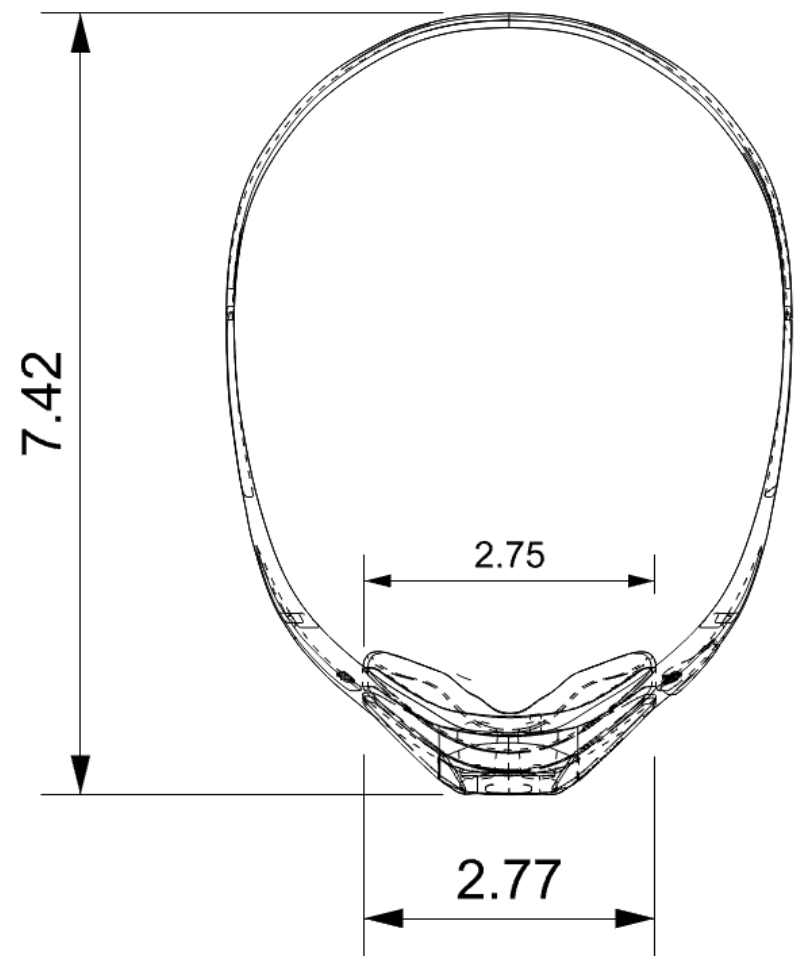
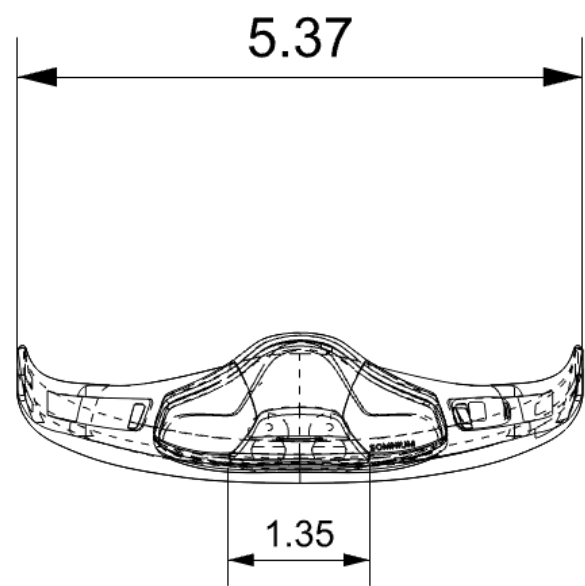
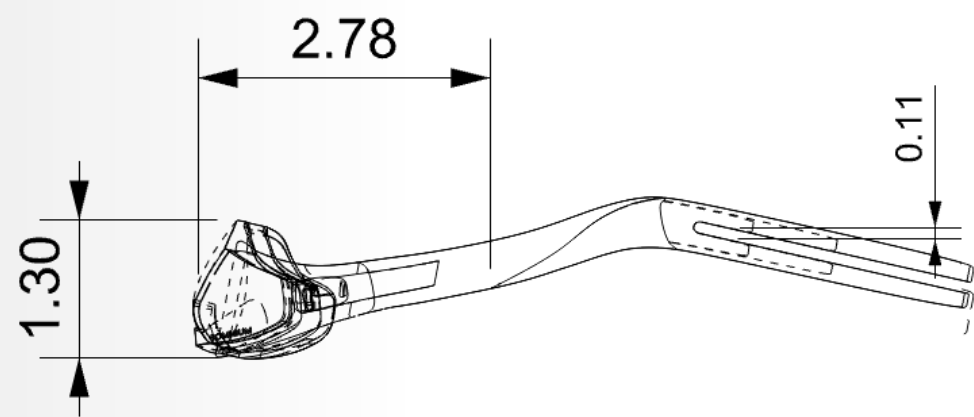
- On top of the unit is a tray to store mask after use.

- Pop-up lid, displaying a simplified interface, readable from atop the bed.



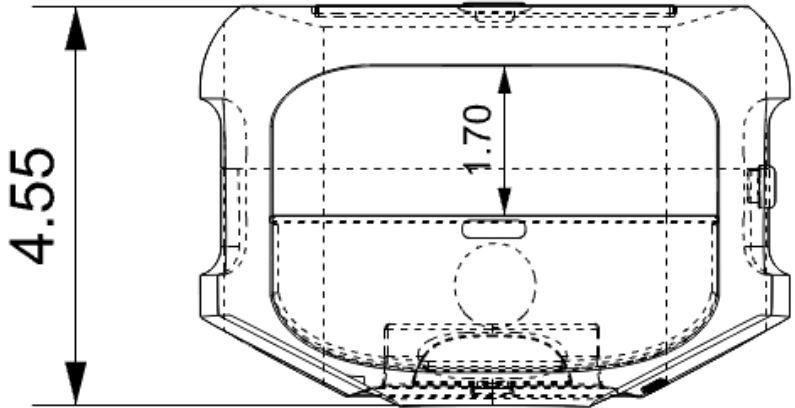
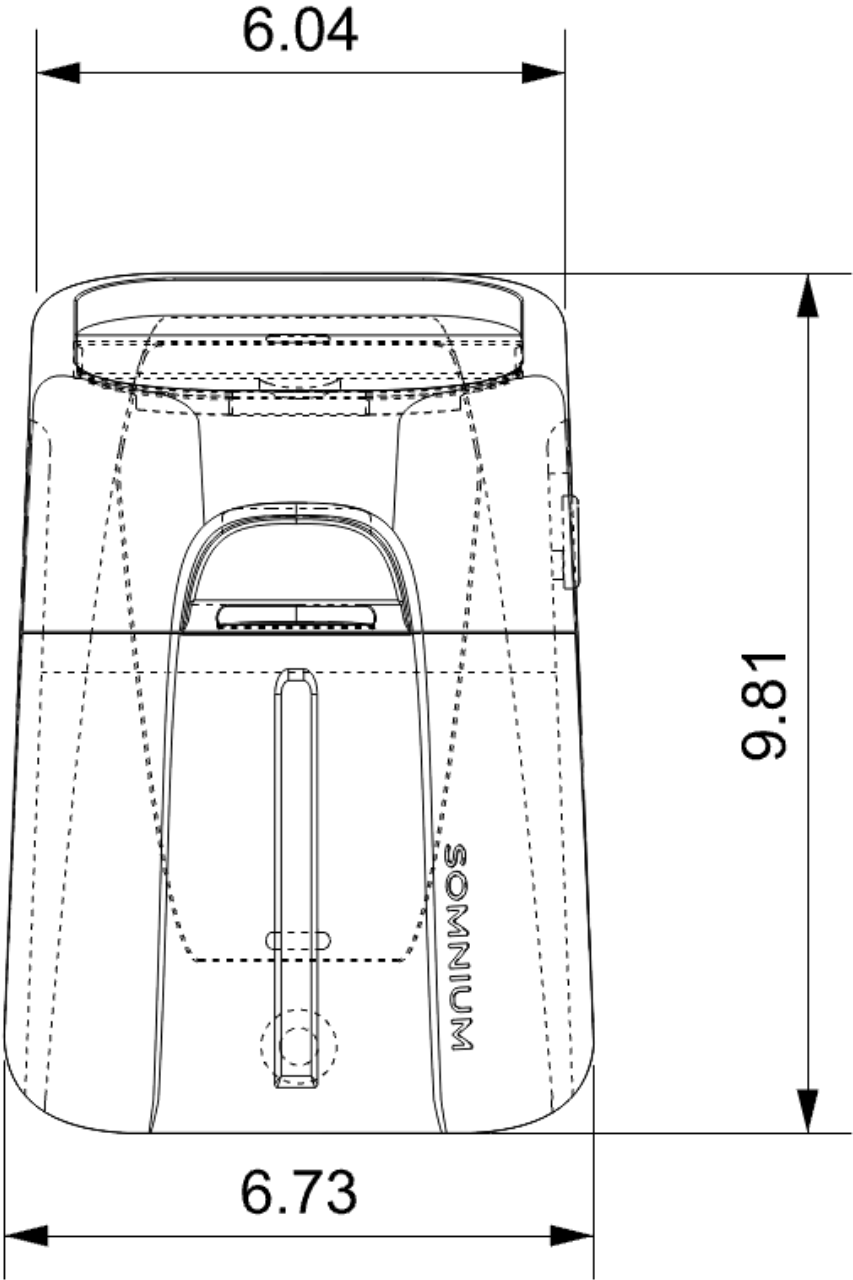
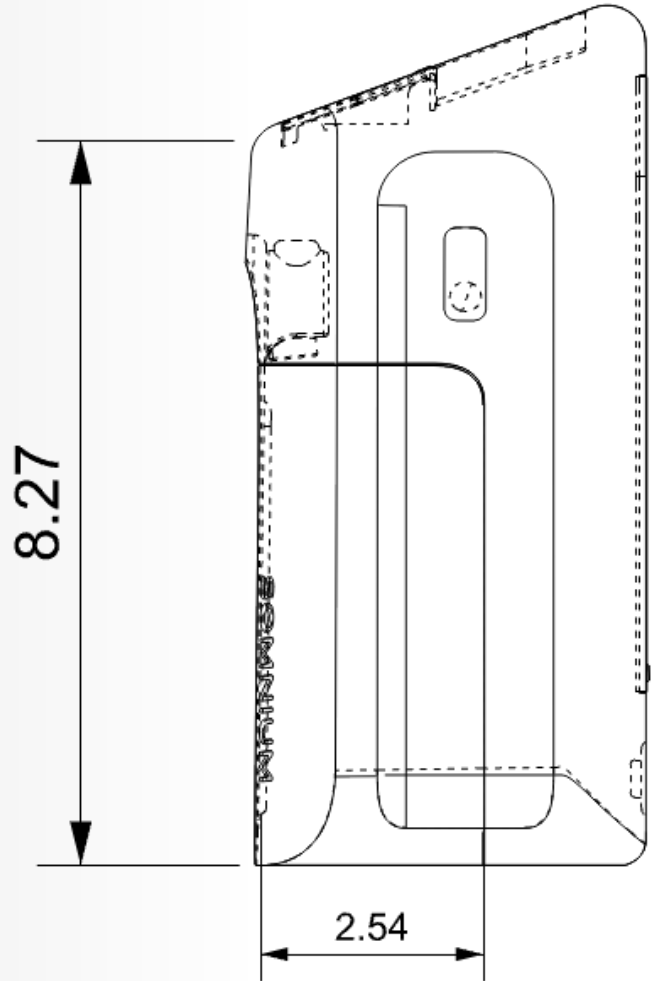
Orthographics

THE NASAL MASK



Orthographics

THE UNIT



Finishes



DAWN



DUSK



MIDNIGHT



Thank You

