



cloi
a waffle maker

Problem Statement



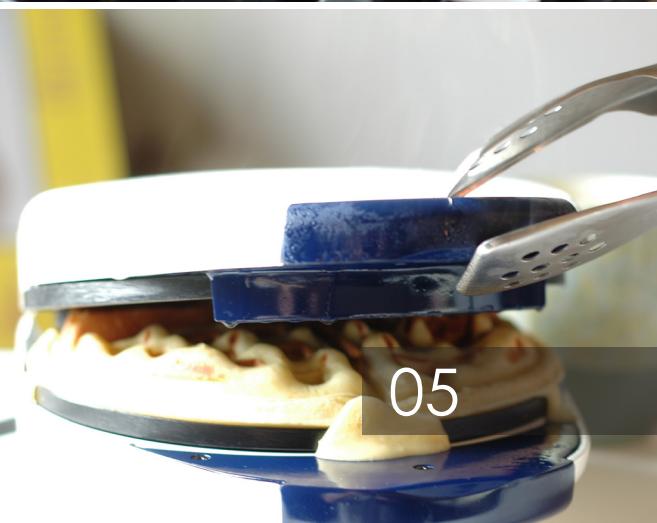
01



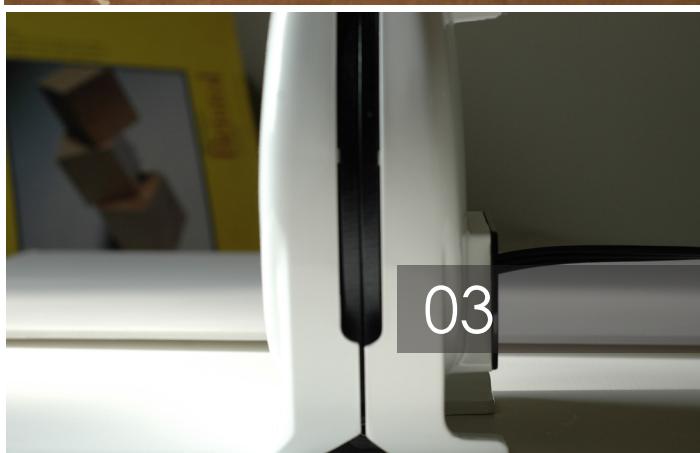
04



02



05



03



06

01

Underestimation of batter quality results in waffle missing corners.

02

Overflowing is a huge issue when making waffle. The overflowing batter sticks to the side due to heating, which further results in difficulty when cleaning.

03

Most waffle makers cannot stand vertically. Thus, they occupy a lot more space when not in use

04

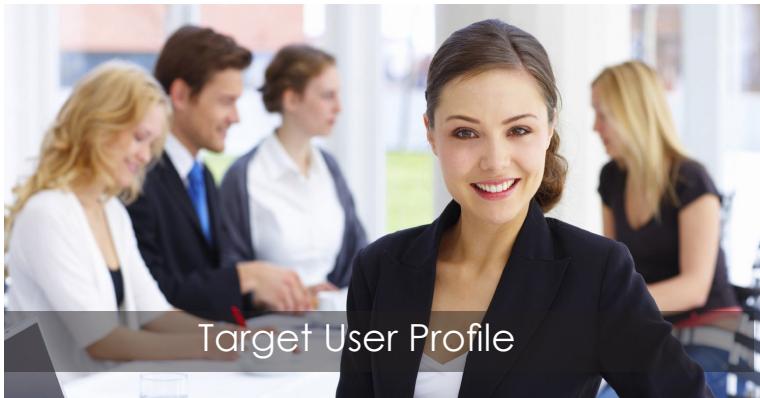
Some iron plates are irremovable, making it difficult to clean.

05

Handles are scorching as steam is trapped inside the waffle maker and escapes in copious amount when lid is lifted.

06

Oil spray onto the iron plate leaks through the hinge when waffle makers are stored upright.



Target User Profile

Gender: Female

Age: 26-35

Family: 3-5

Career: Professional

Lifestyle: Work and Life balance

Priority: Care for her family

Hobbies: Traveling and hiking



Hello, my name is Yuhan Li. I am an Industrial Design Student. Currently, I'm working on the redesign of waffle maker.



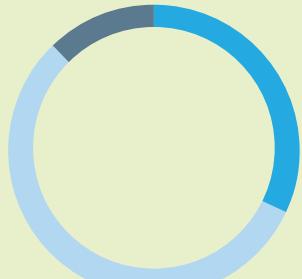
➡ Waffle Maker Problem Shooting Survey

1. How much time do you have to make breakfast on weekdays?
 0-5 min 5-15 min 15-25 min over 25 min
2. Do you clean immediately after you had breakfast?
 Yes No
3. Have you experience waffle batter overflowing while cooking?
 Yes No
4. What's the three most important issues while using a waffle maker?
 Unevenly cooked Burnt Waffle Storage
 Size too small/big Scorching Handle Timing too long/short
 Sticking Imperfect Shape Batter overflowing
5. I make batter _____.
 Just before I cook Last Night and refrigerator it. With the one premade from Walmart
6. How much are you willing to pay for a waffle maker ?
 Below \$30 \$30 to \$60 \$60-\$100 \$100-\$200
7. Please describe any unpleasant experience with waffle maker?

Survey and Interview

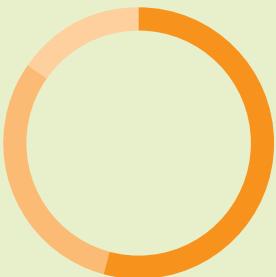
30 people within the target user group were interviewed and asked to fill ou the above survey form which helped me gain much insight into the issue.





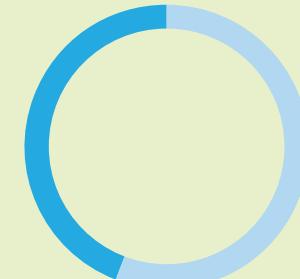
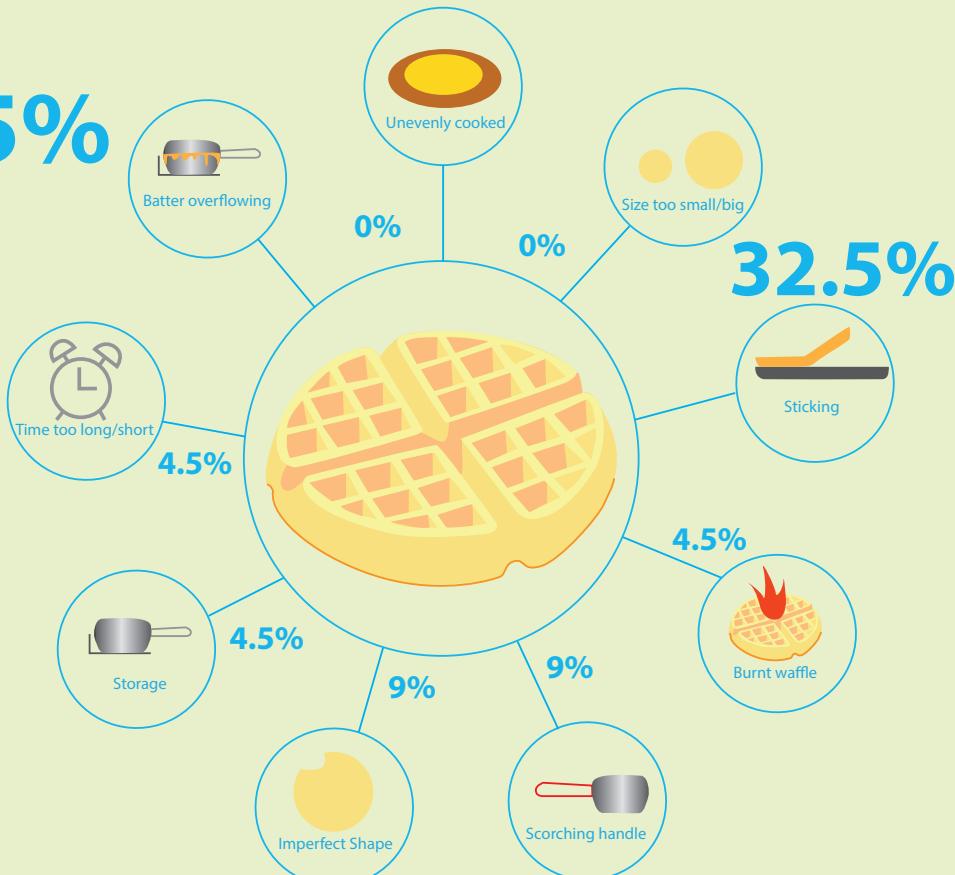
How much time do you have to make breakfast on weekdays?

I make batter_____.



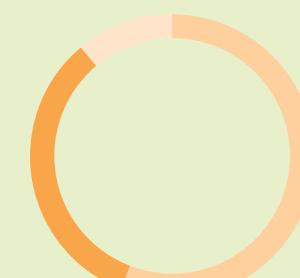
- █ Just before cooking
- █ Last night and refrigerate it
- █ With the one premade from Walmart

35%



Do you clean immediately after you have breakfast?

How much are you willing to pay for a waffle maker?



- █ Below \$30
- █ \$30 to \$60
- █ \$60 to \$100

What I find out from the survey result...is

Most people within target user group only have at most **15** min for breakfast...

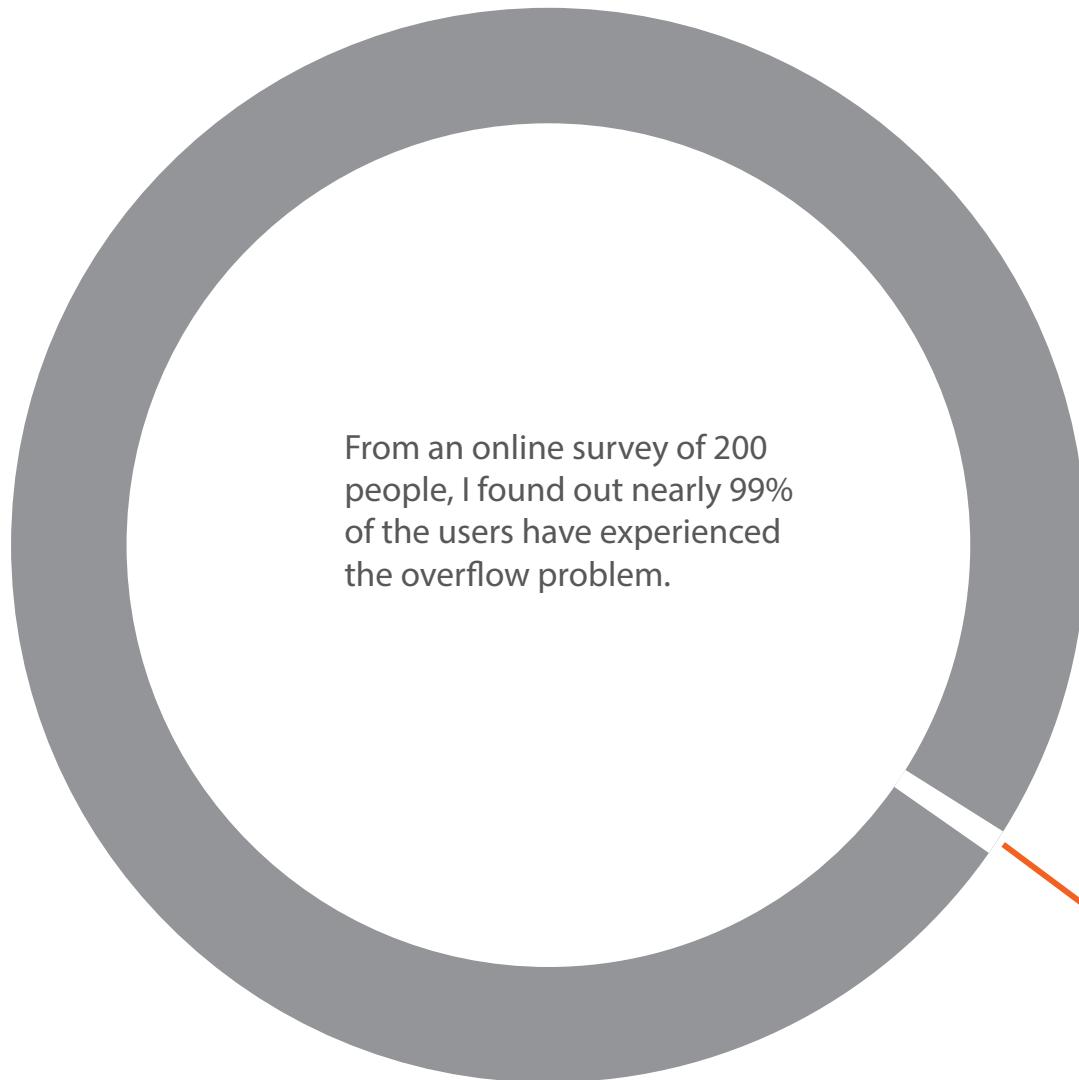
That means,

$$\begin{array}{rcl} 4 \text{ min} & + & 3 \text{ min} & + & 3 \text{ min} & + & 5 \text{ min} = 15 \text{ min} \\ \text{mixing batter} & & \text{cooking} & & \text{eating} & & \text{cleaning} \end{array}$$

IF, the batter **overflows** ...

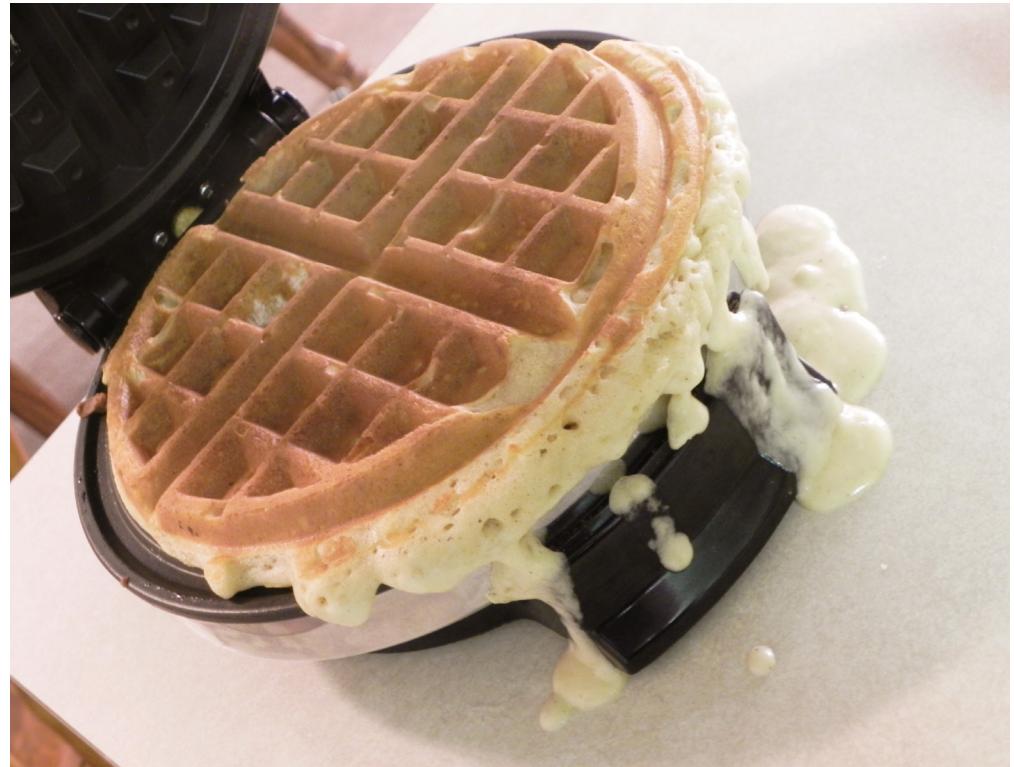
Then, the overflowing batter will sticks onto the side of the waffle maker,
making it really hard to clean.

There's no way to clean it immediately...



1%

Percentage of surveyed people who had never experienced the overflow problem in a waffle maker.

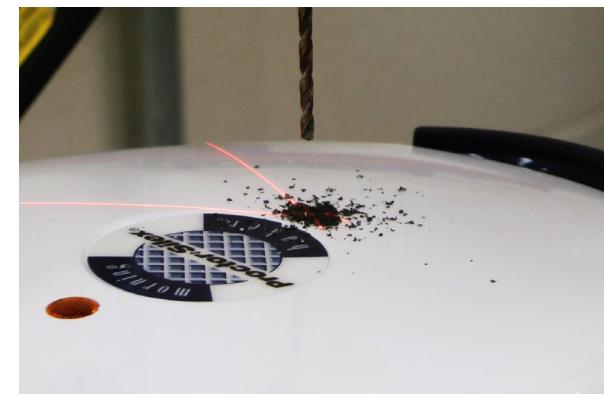
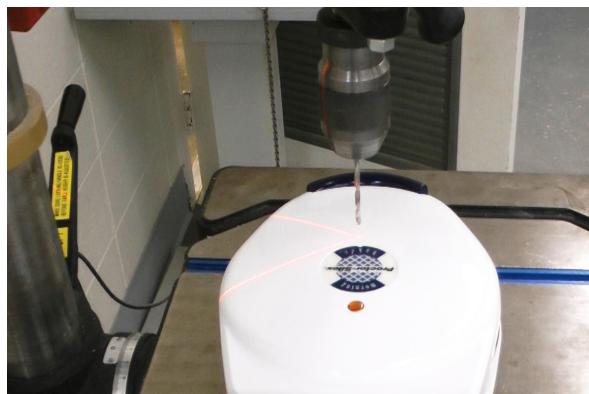


Most overflow comes from the **rim** when batter expand during heating, this happens because the gap between the upper and lower lid is the only way that expanding batter could escape.

Therefore, I thought of an **overflowing compartment** on the top section of the waffle maker, directly connected to the cast iron plate. In this way, the expanding batter could escape into the overflowing compartment and trap inside a mesh, both which can be removed and cleaned.

To test this idea, I conducted an experiment...

Proof of Concept



Design Challenge

Handle	Need to integrate into the general form, however large enough to be ergonomic.
Overflowing Compartment	Directly connected to the mold and removeable.
Stand	Vertical for storage and horizontal position when in use.
Temperature Control	Light need to be more conspicuous and less link to traffic signal, more to food.
Wire	Cord management must be taken into consideration.
Oil and residue	Collect oil dripping from the iron plate, allow easy cleaning.
Removeable plate	Must be removable so it is easy to clean.
Scorching Prevention	Emotional attachment weakens if being scorched, hence an outlet for steam to escape must be incorporated.

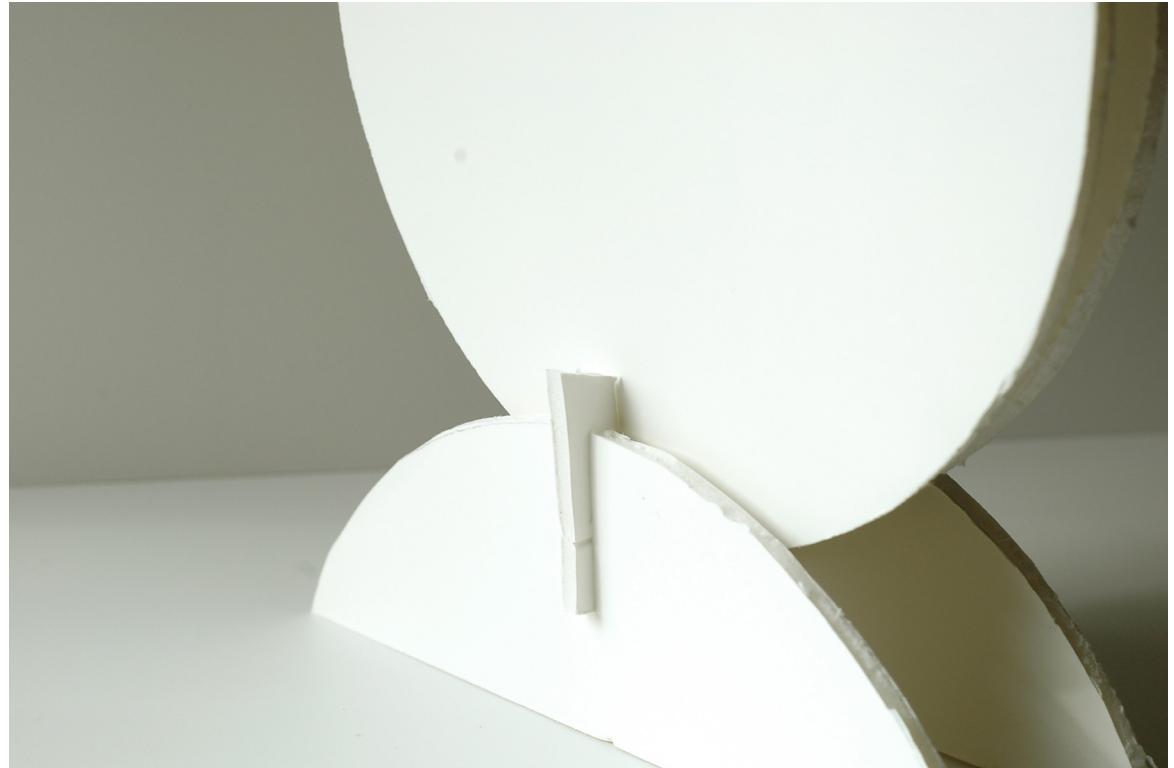


Looking into Market...

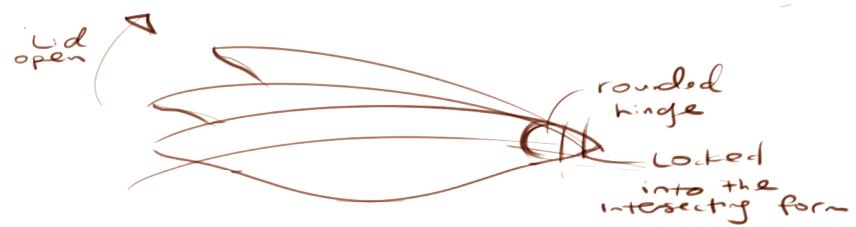
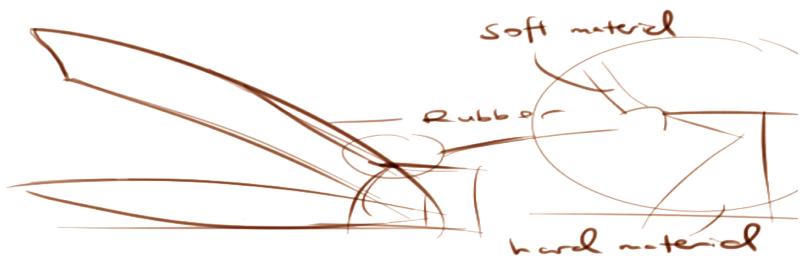
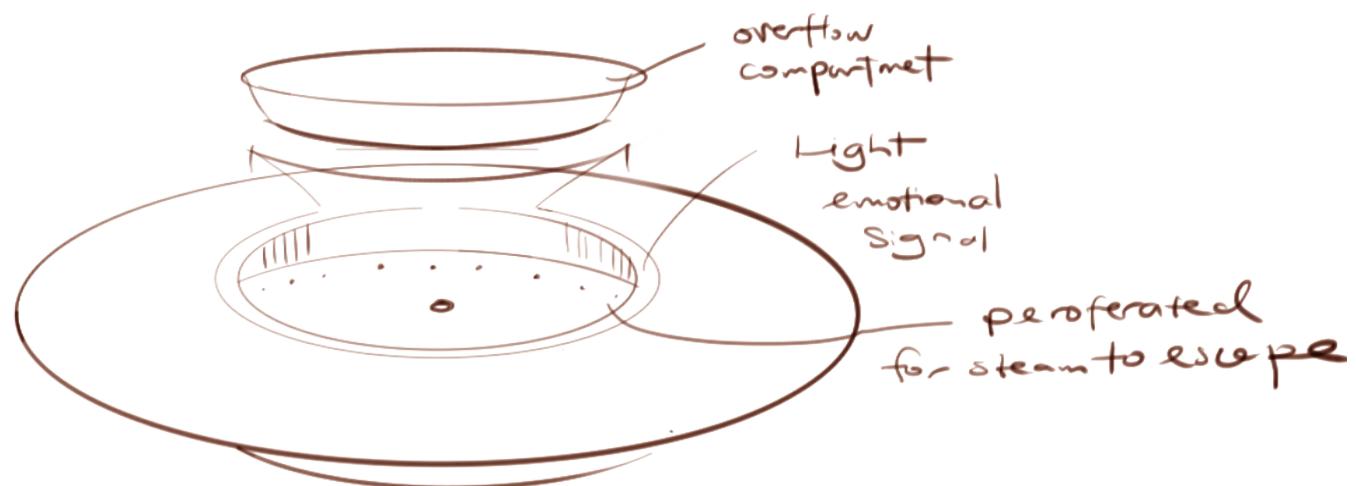
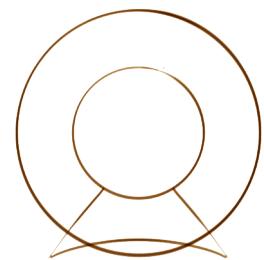
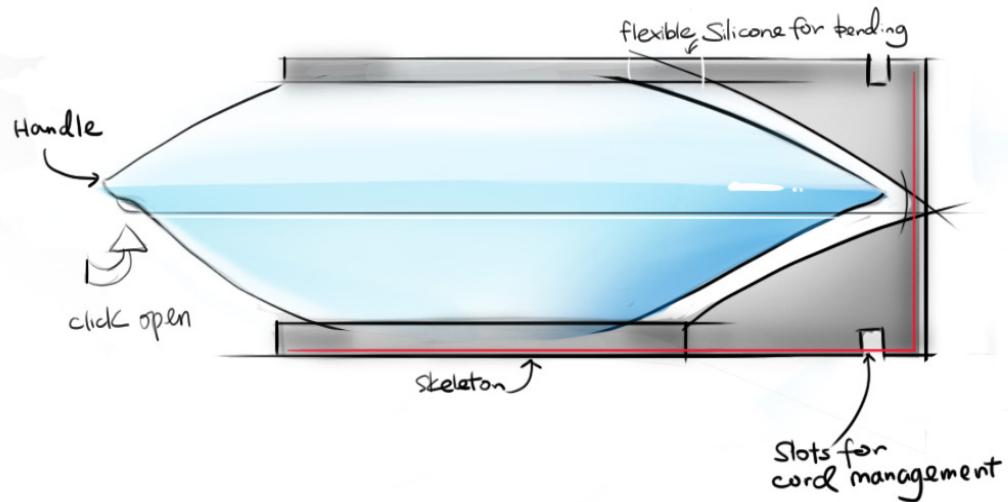
Different Brands resemble each other closely.

Most of them have a stainless steel look, conspicuous black handle, and stand.

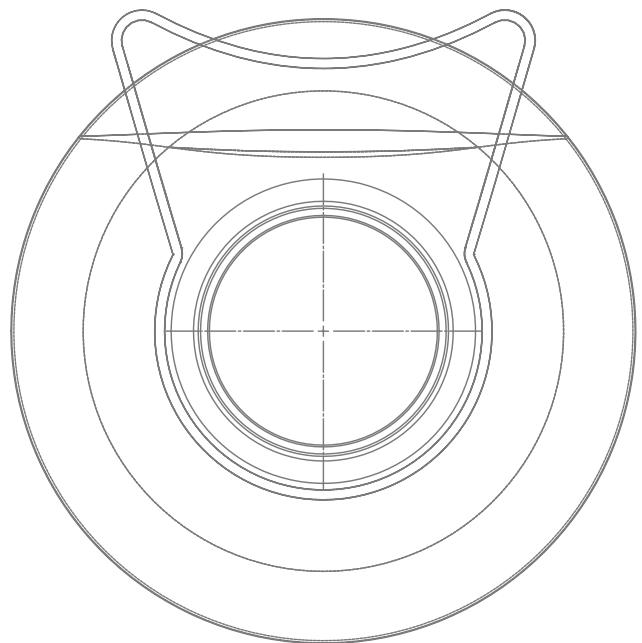
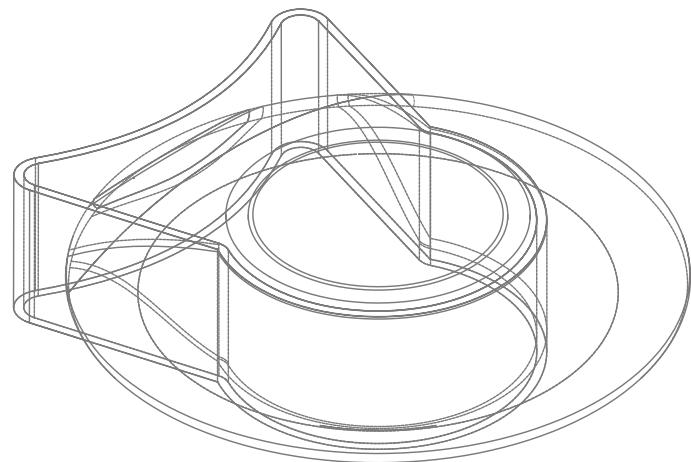
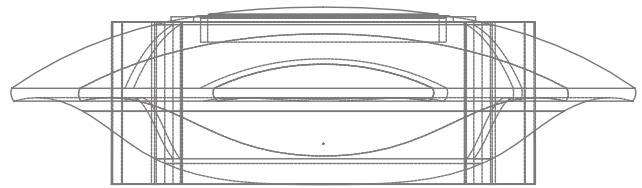
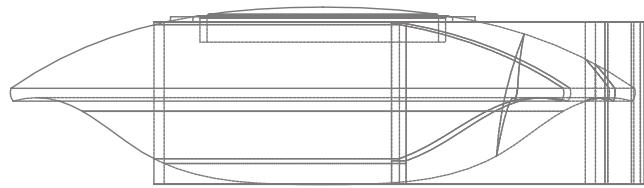
I decided to be more exclusive...



Some rapid prototypes were constructed with foamcore board, this allow me to visualize my design...



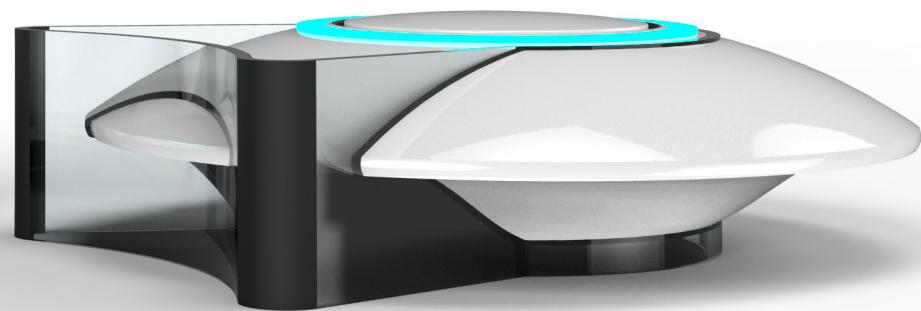
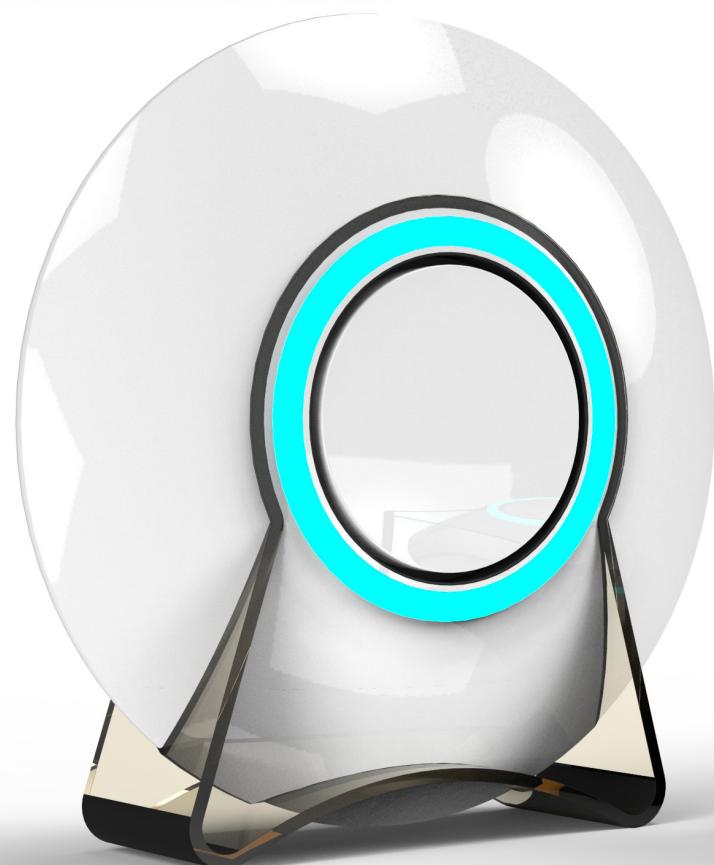
Ideation

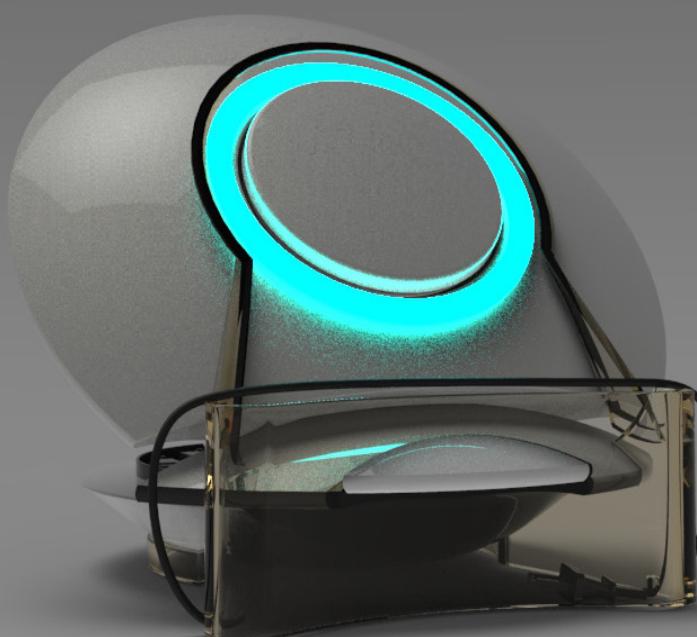


Orthographic View



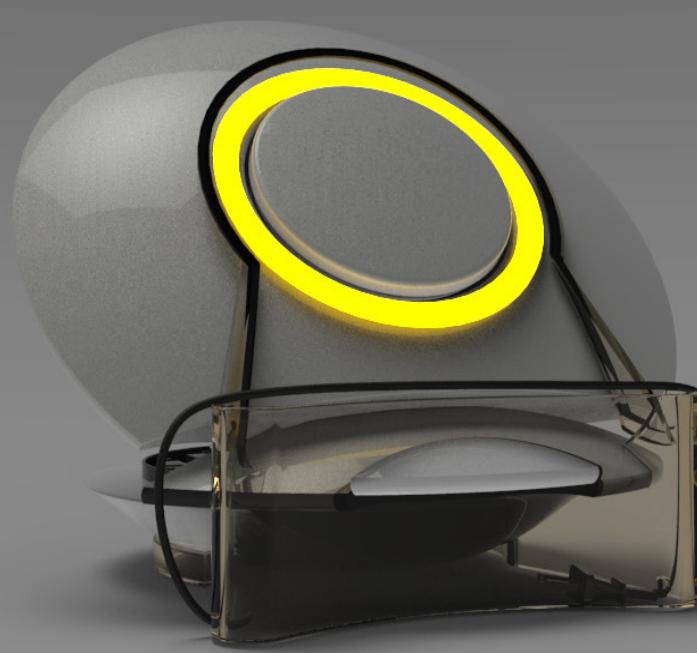
Final Form



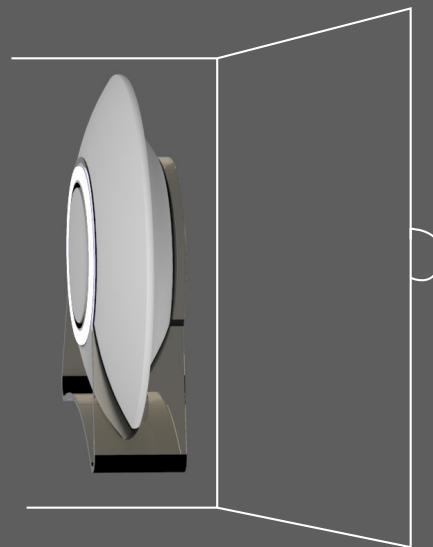
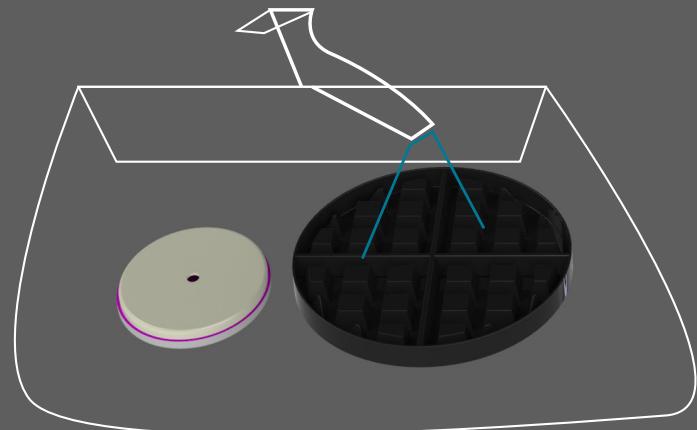
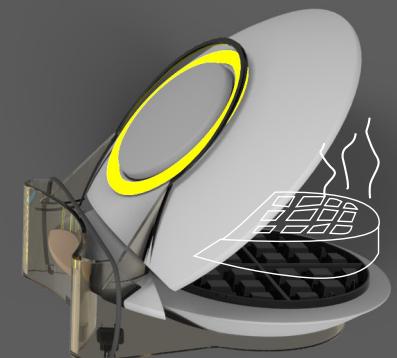
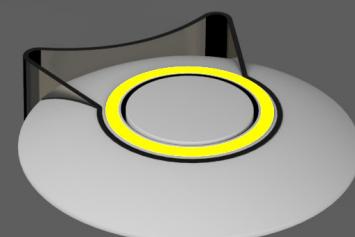
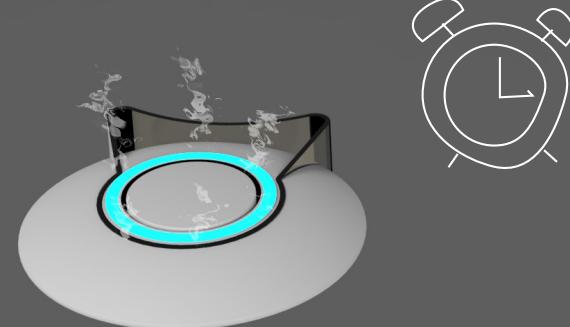
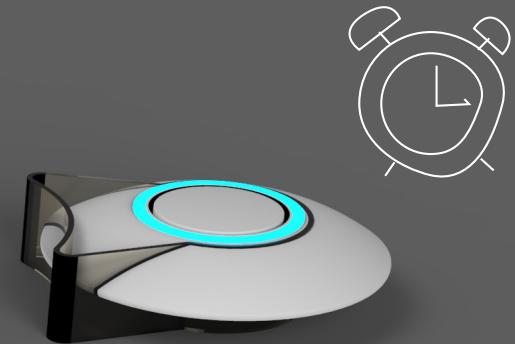
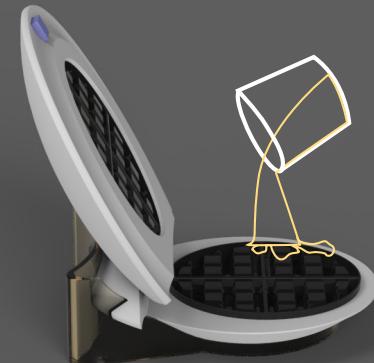
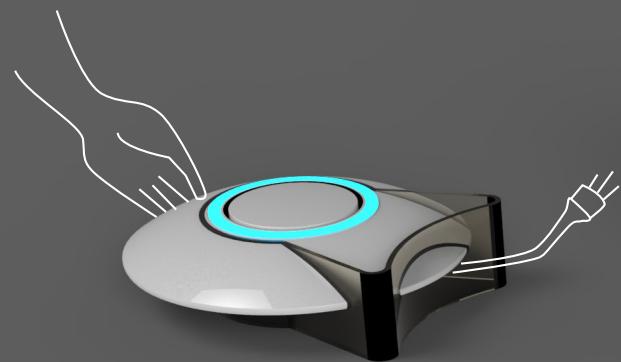


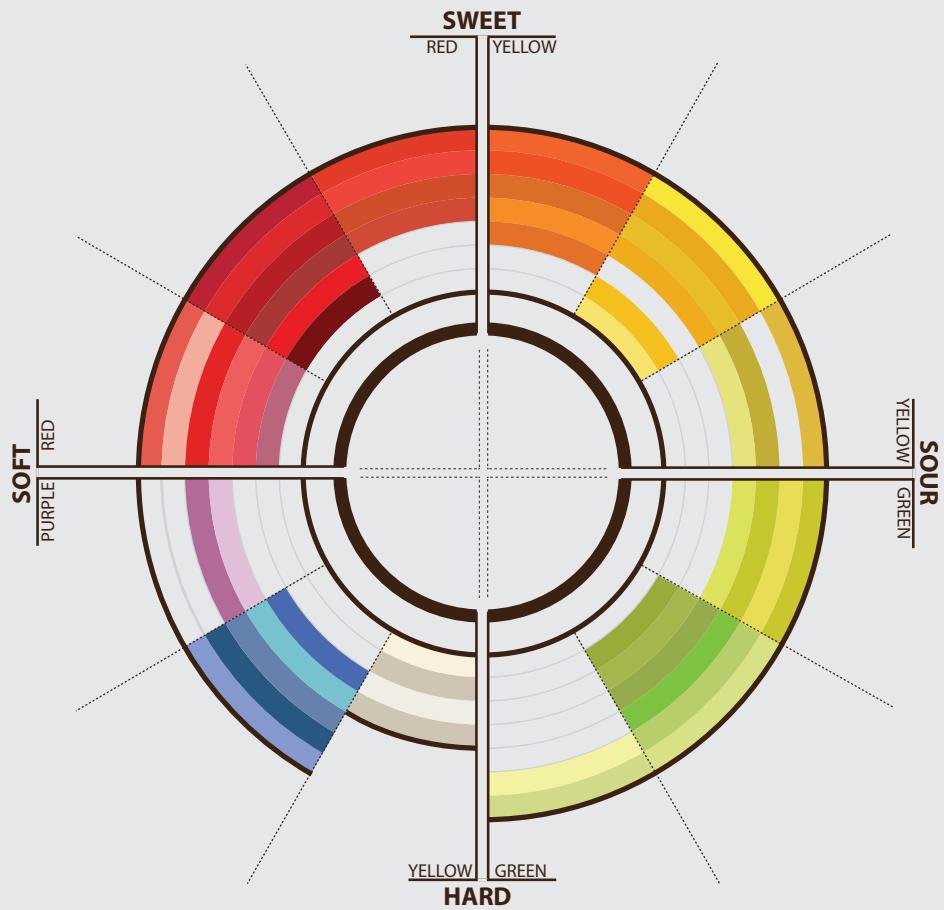
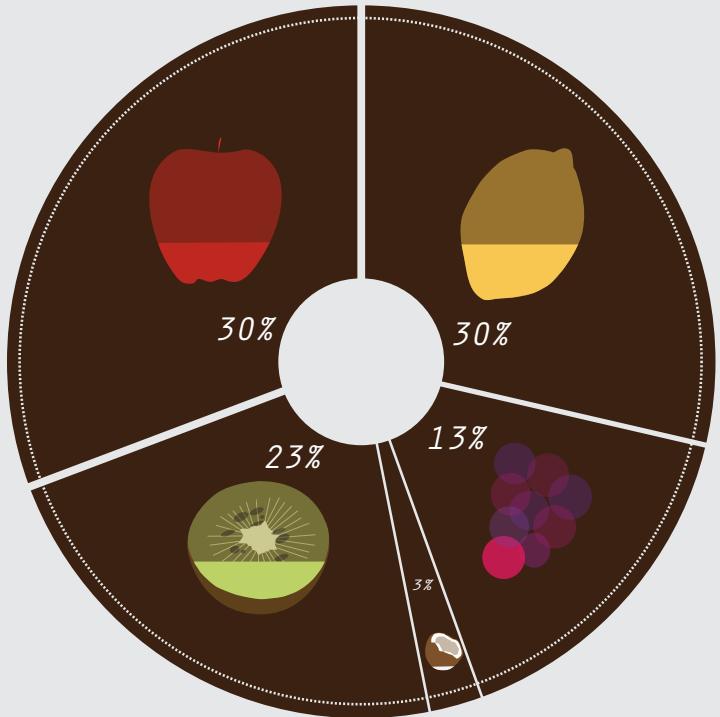
cooking...

No more link to
traffic light...



ready to eat...



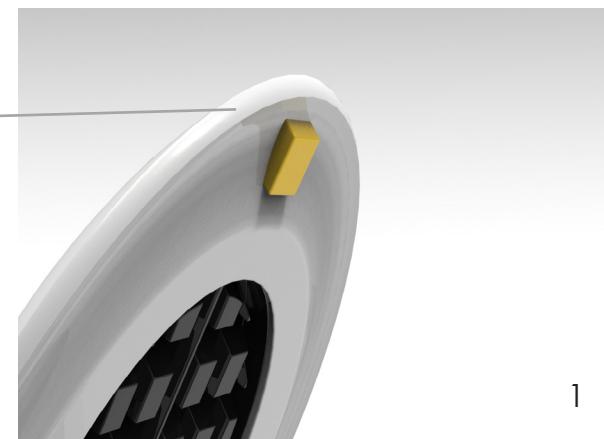
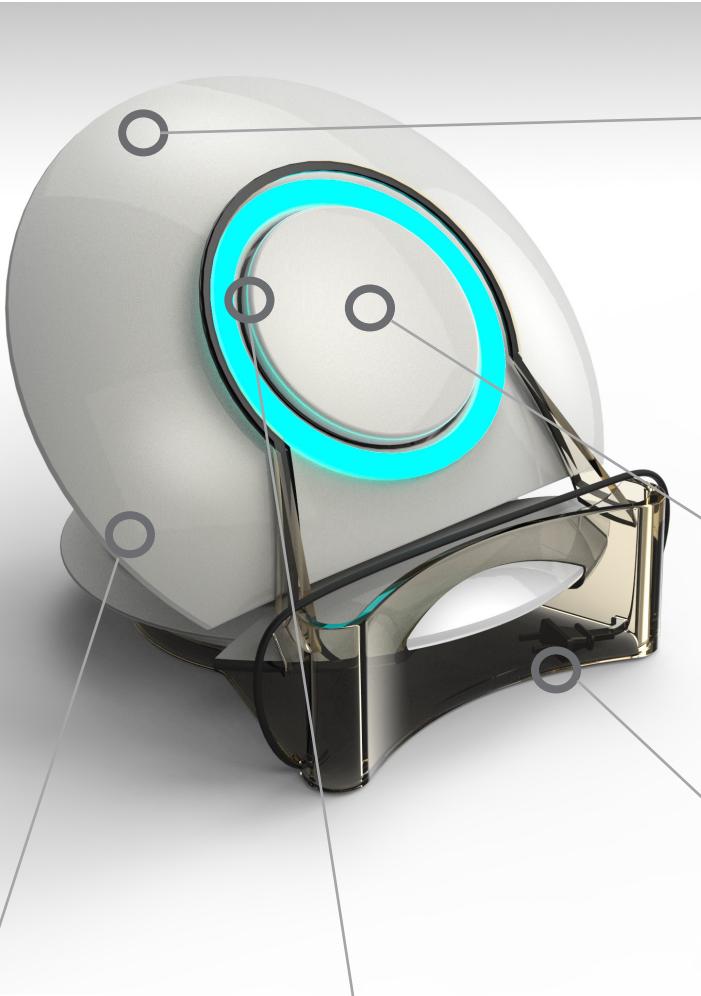


A study of color related to fruit was conducted as fruity colors promote sweet sense, which is the emotional cue I want for Cloi. All the colors on the right wheel are considered for Cloi. Only four are selected.



Colorful Options

1.Handle both large enough and goes along with the general form.



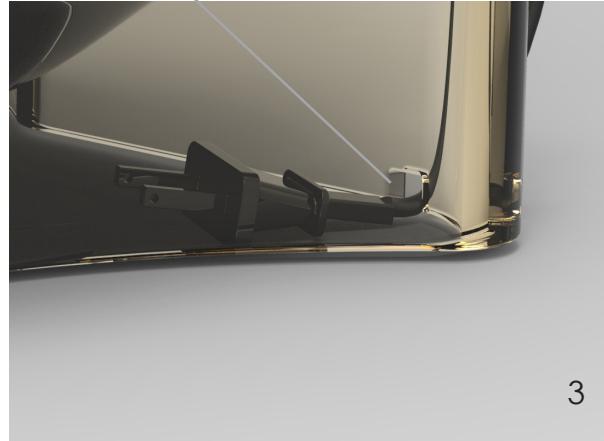
1

2.The overflow compartment. There are three sections: the cover, the mesh for trapping batter and the teflon coated base.

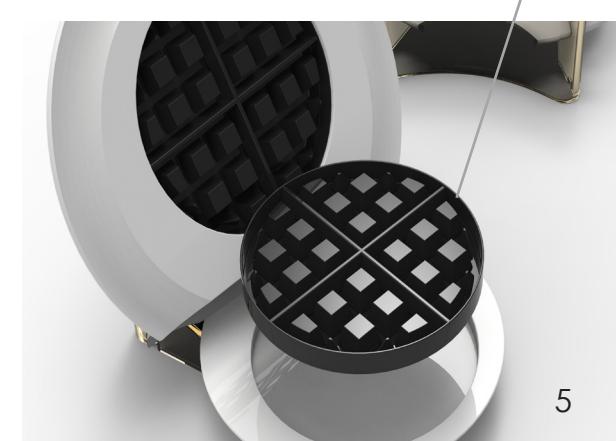


2

3.Two small cuts around the base for cord management. Transparent and open base for cleaning oil dripping from the hinge.



3



5



4

1. Injection molded Acrylic decorative frame around the light.
2. Extruded Aluminium overflowing compartment cover, painted with white glossy paint.
3. Pri-crimp waved stainless steel mesh for batter tapping. Connected to 3 with a rubber band on the edge.
4. Cast aluminium plate with teflon coating, connected to 6 through magnetic attraction.
5. LED light.
6. Injected molded aluminium upper housing with glossy white paint.
7. Upper cast iron plate with non-stick coating
8. Injection molded PVC button.
9. Injection molded Aluminium upper and lower hinge.
10. Lower cast iron plate with non-stick coating.
11. Injection molded aluminium lower housing with glossy white paint. Housing for heating coils and thermostat
12. Injection molded acrylic base with rubber for better friction.
13. Plug.
14. Small cut for cord management.
15. Injection molded Aluminium with glossy white paint, attached to the acrylic base, non-functional.

