EXPLORATION OF EMOTIONAL DESIGN ELEMENTS IN ELECTRICAL PRODUCTS

Diploma Candidate
Deheng Kong

Field
Industrial Design

School
Institute of Design
The Oslo School of Architecture and Design

Supervisor
Steinar Killi

Collaborator
Wilfa

CONTENTS

BACKGROUND

What initiates the project?

E-waste

Electronic waste or E-waste describes discarded electrical or electronic devices.

This project was initiated by my concern about the E-waste situation in the world now. 20 to 50 million metric tons of e-waste are disposed of worldwide every year.

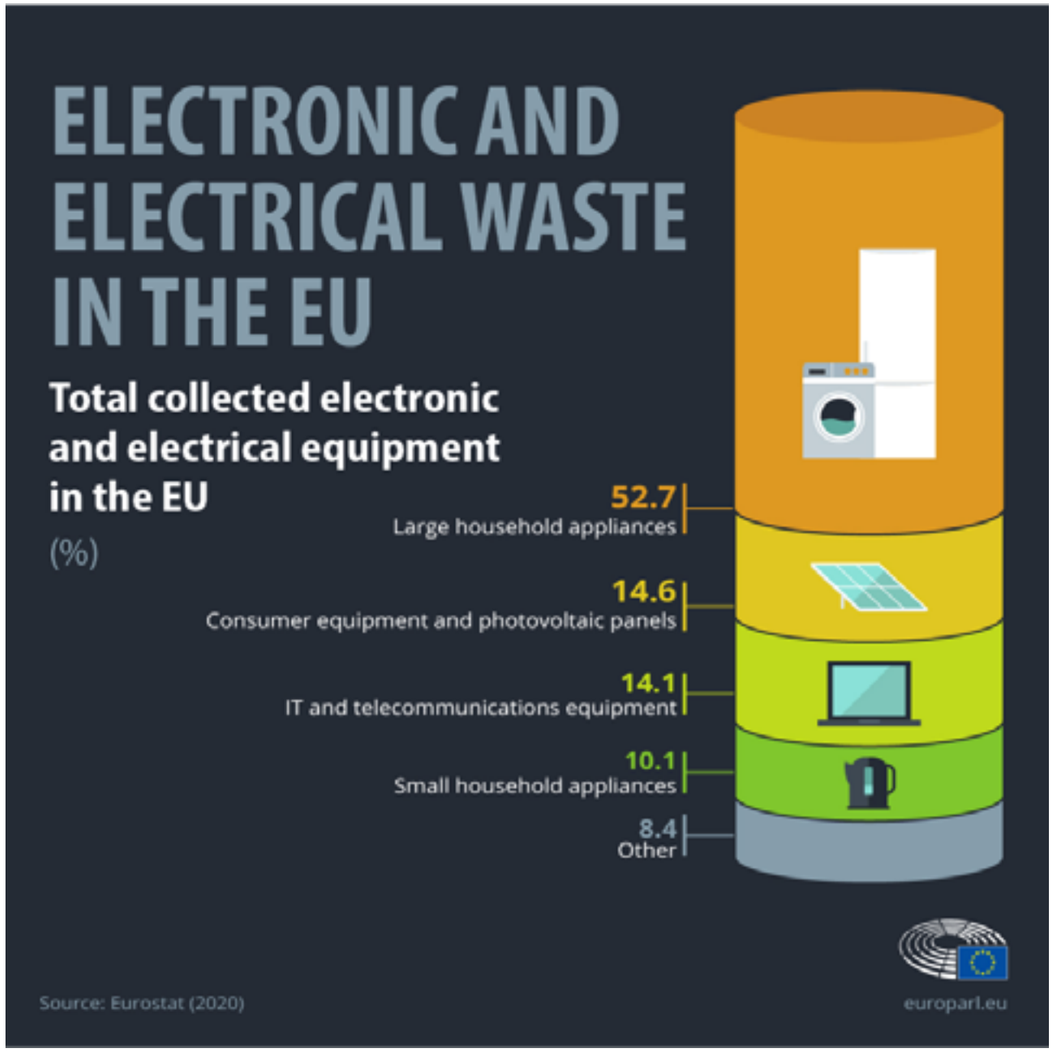
In fact, Norway produces the most E-waste per capita in the world in 2019, while China, where am I from, produces the most E-waste as a whole.

Source: http://www.nationalgeographic.com/science/article/e-waste-monitor-report-glut

Home appliances and sustainability

Home appliances are products I want to work on more as a designer. Because they are so tightly connected to our lives.

However, as one type of electric product that contributes to the E-waste in EU in 2020, I definitely see the necessity for home appliances to adapt to the inevitable sustainable future.



In 2020, large and small household appliances contributed near 62.8% of E-waste in EU

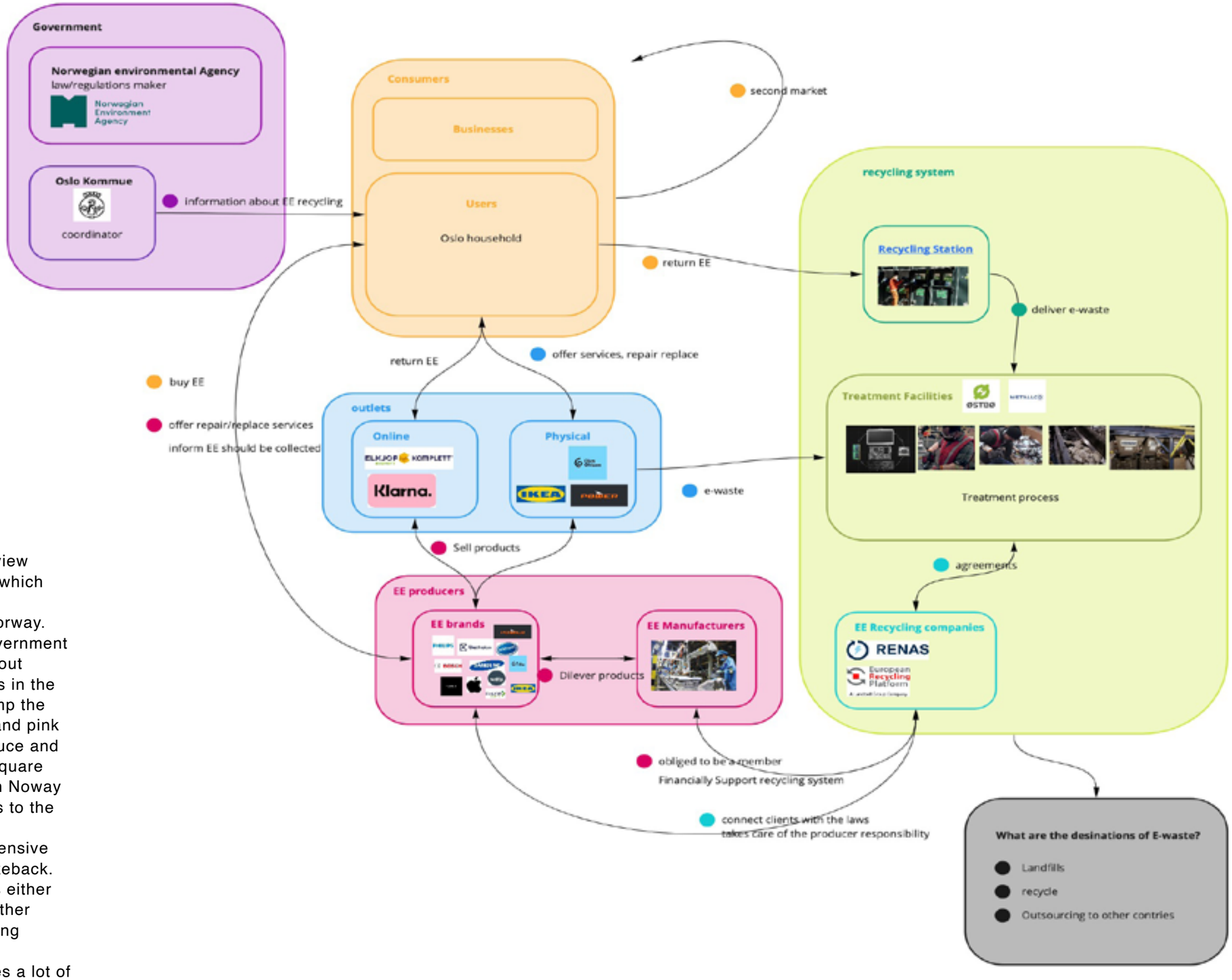
INITIAL RESEARCH

Scope down from a big picture

In the initial research, I took a look at how waste from electrical products is generated in Norway and how designers would address this issue. And try to scope down from such a broad topic.

E-waste actor map in Norway

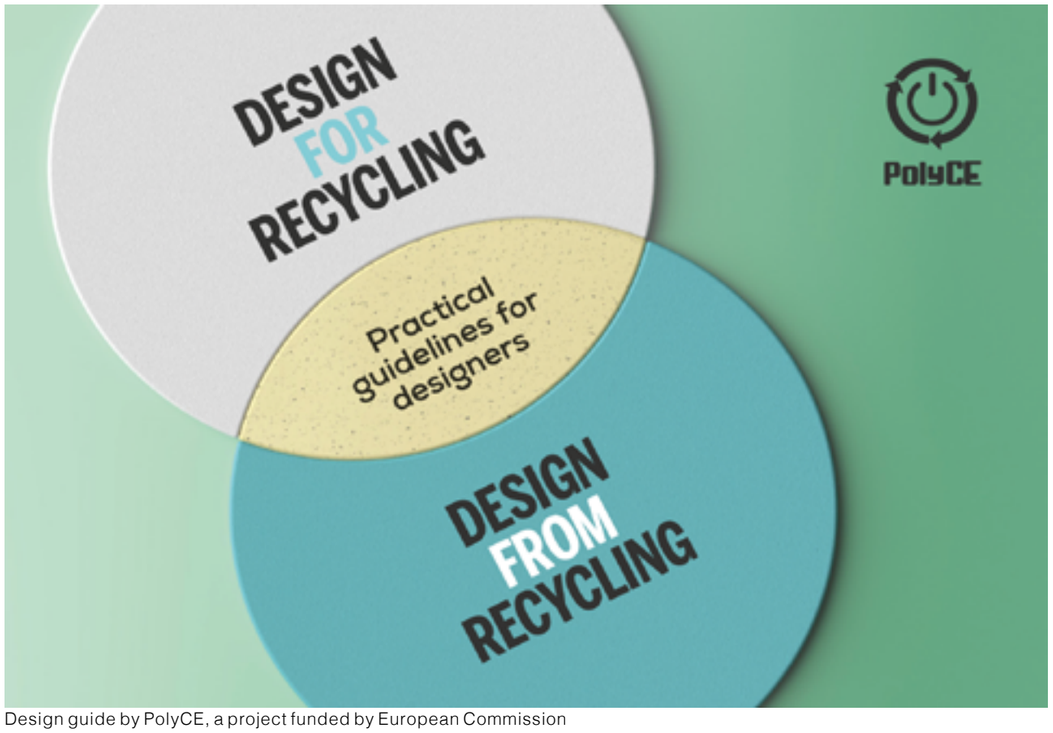
I began the project with holistic view research. This actor map shows which stakeholders are involved in the electronic product life cycle in Norway. The purple square stands for government parties who make regulations about e-waste recycling, the consumers in the orange square buy, use, and dump the product. We also have the blue and pink ones which are brands that produce and sell products. Lastly, the green square is an e-waste recycling system in Noway that collects and does treatments to the e-waste.
It's clear that there is a comprehensive system in Norway for product takeback. The destination of the E-waste is either being landfilled, outsourcing to other countries or recycled. But recycling e-waste is very hard due to the complexity of the process, it takes a lot of money and energy.



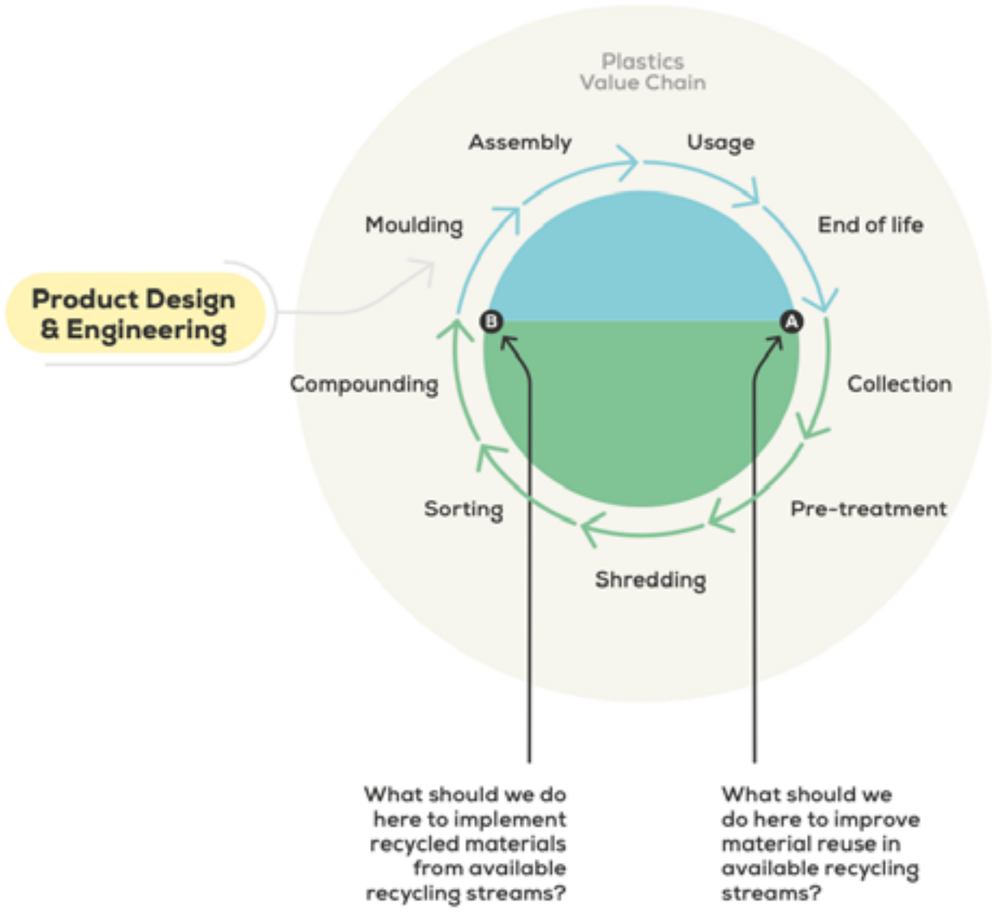
Research on current trends

I did research in order trying to find out how are people tackling the E-waste issue.

1.Design products for recycling
Making products more recyclable or designing products from recycling material is one of the topics people are looking into to keep the materials used for production in the loop. PolyCE is a organization dedicated to transform the life cycle of e-plastic materials into a more sustainable one. In their design guide for electronics designers, they share insights and examples on how to reduce the use of virgin plastic by Circular development.



Design guide by PolyCE, a project funded by European Commission



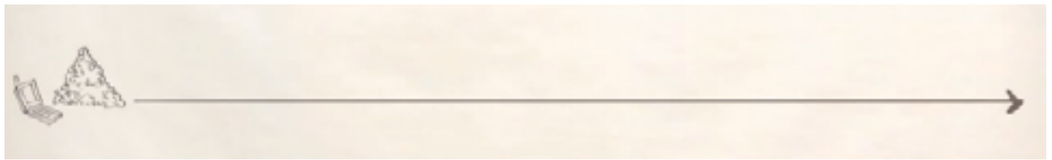
Circular development according to Pezy Group

2.Design products for longevity

There is also a big trend that extends the lifespan of the product. Because products with a long lifespan really keep the resources in the use phase, while we don't need more material and resources to produce new products.

Phone can be only used for 1 year

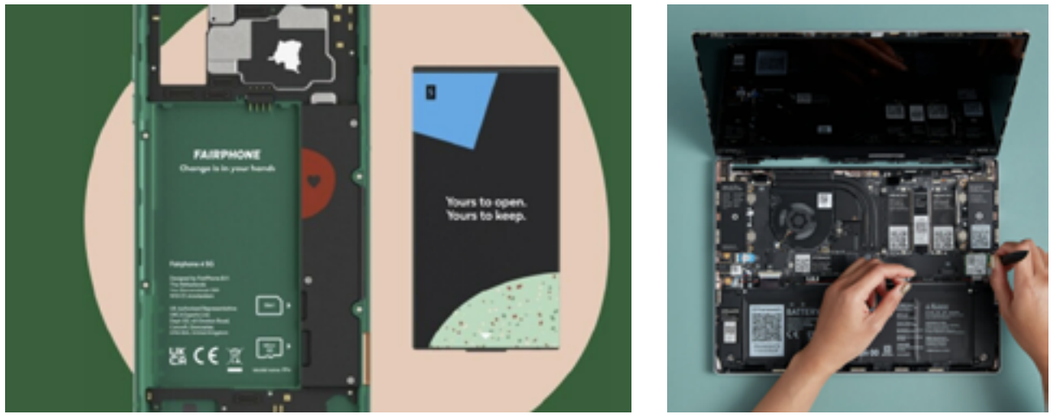
Phone can be used for 5 year



Phone can be used for lifetime

For this, one could look at the **technical side** to make the product more durable, and repairable.

But there is also an **emotional side** where increasing the users' willingness to keep the product so it can be repaired when broken, and updated when under trend. In this way, the product can serve a longer lifetime.



Fairphone and Framework laptop, they are designed for durability and repairability, so can be used for long time

Anglepoise Type 75, the kind of product that people will keep for generations

Collaboration with Wilfa

In order to bring more depth to my project, I started a collaboration with Wilfa through the help of my advisor. Wilfa is one of the biggest brands in Norway that produces small and medium-size home appliances.

Through conversation with Wilfa's in-house designer Vegard Fjelland (he left this position when I am writing the report). I get to understand Wilfa's value and how are they positioning their products.
Wilfa puts lots of value on honesty and solid engineering in their products. They have three product lines, which they call: white, gray, and black lines. The White Line is products outsourced from other brands and Wilfa sells them. Grey Line is a product that Wilfa buys from other companies but then did small changes to the design. Black Line is the in-house designed product that stands for Wilfa's Premium products.

Marketing Materials on Wilfa's website

Key insights

1. This is a very big scope that requires a lot of actors make their contributions to make more sustainable electrical products, there are no absolute answer. This is also why I want to lead my project into a more exploration one, as I can push the boundaries, try something other people haven't done before.

2. Recycling is one way but challenging. As a designer, it is our responsibility to design something that can be easily recycled, reused, re-purposed. One can also think about how to design from recycling materials. However, it is very hard to recycle electronics, as they are getting more and more complex, compact.

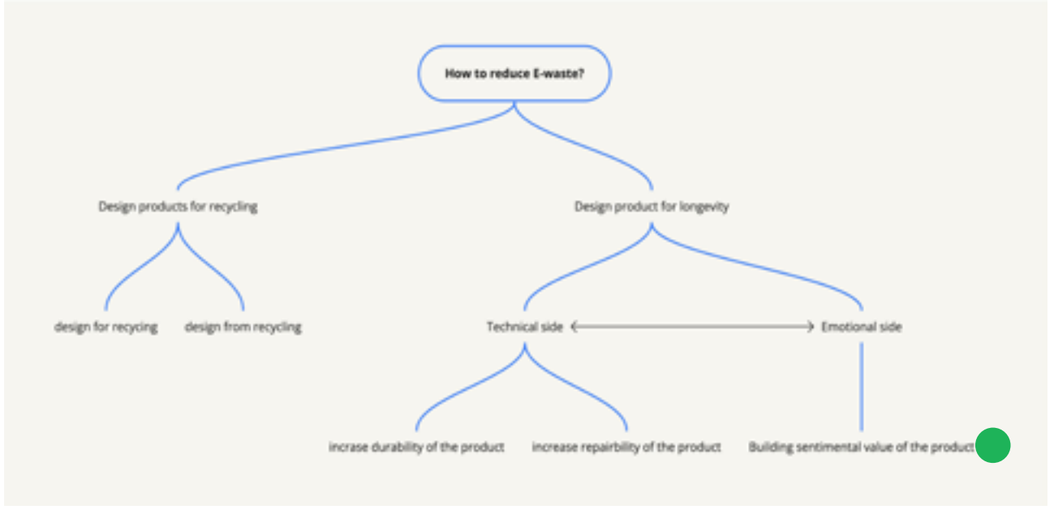
3. Design for longevity is another way to go. I see it a more viable way for us to transfer electrical products more sustainable. There is a technical side and a emotional side to do that in the current trend. **However, I want to explore more on design for emotions to increase the users' willingness to keep the product so it can be repaired when broken, and updated when under trend. In this way, the product can serve a longer lifetime.**

I am intrigued by the challenging side of this direction. As a designer, I have been trying to make things that has nice functions, but have rarely though about the emotional side of the product in a deeper level.

"Perhaps the best way to ensure a product gets repaired is to make a product that people actually want to keep in their lives. Building sentimental value is a challenge in today's throwaway society, because people are much more likely to try to fix something that is important to them."

Tony Elkington, Studio Elk

Mindmapping for the choice



Choose the direction: Design for emotions. While there are a lot of products in my research that explore modularity and repairability, It is also very important to make people actually want to keep the product in their life. So I want to explore more on this.

The direction I have chosen

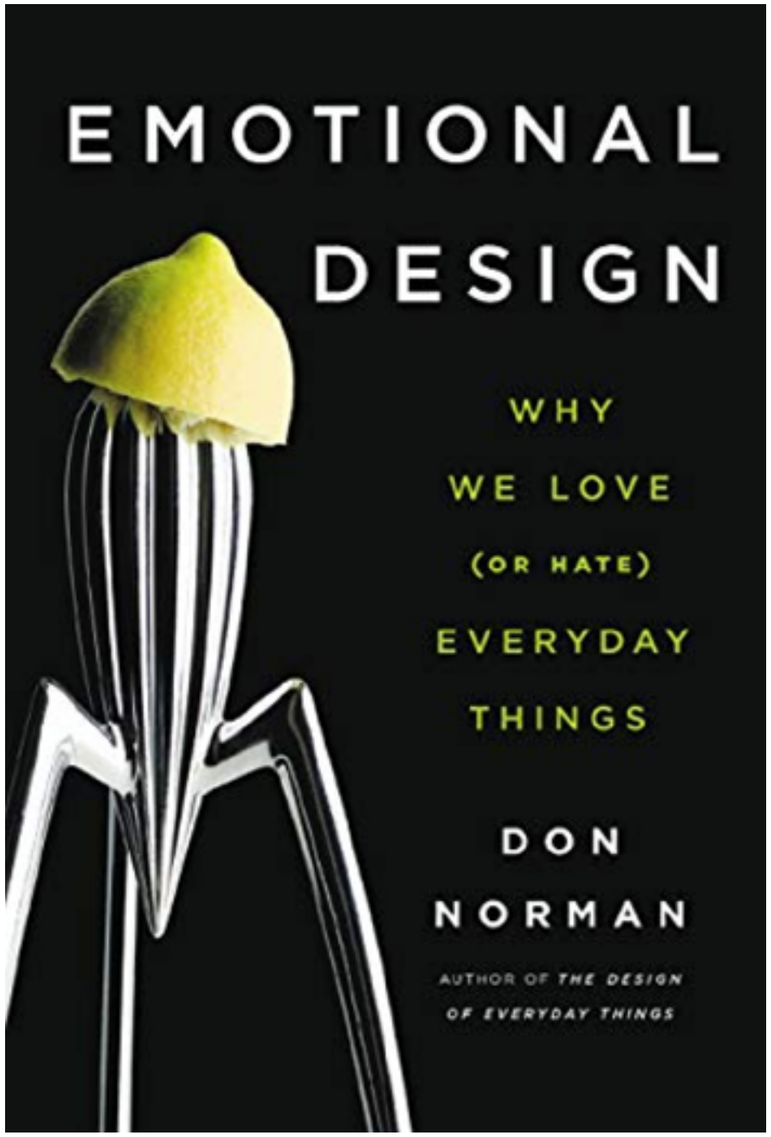
SECONDARY RESEARCH

Emotional design, but HOW?

In this stage, a closer look at emotional design has been done. I decided to focus on senses as a direction for emotional design. On top of this, I chose a coffee grinder as an example product to move further.

Emotional Design by Don Norman

In order to find out what it means to increase desirability, I read the book emotional design, in which I found out there are 3 ways to make a product desirable. The first one is to make a beautiful product with a pleasant shape. The second one is a nice functional product that can have existing features and functions. The last one is also the most exciting one for me, is to design a product that people can reflect on, or can tell a story about it. This means people can build stronger emotional bonds with the product.



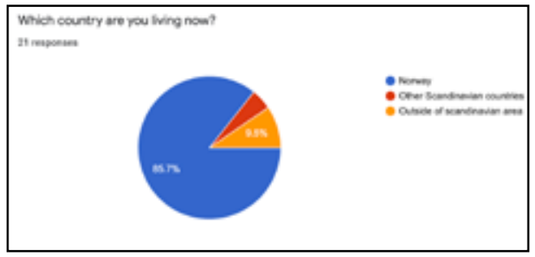
4 interviews

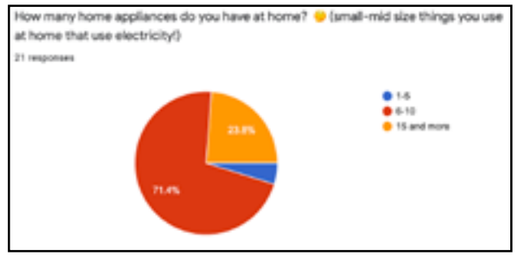
In order to find out more about emotional design, and user behaviors. I had several conversations with end-users. In the interviews, I asked them **what kinds of electronics they like, and what makes them special for the owners**.

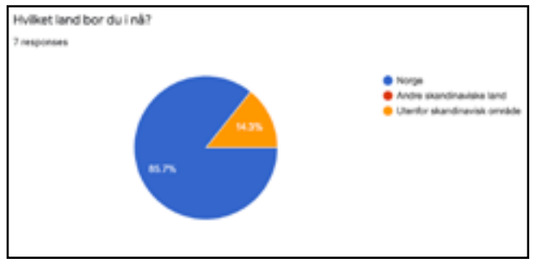
I got some very interesting feedback. It can be a product that you've been using for a long time and it shows the aging features on it (camera), it can be a product that you made by yourself (hand) and repurposed, or it can be a product with a history behind it (cheese storage).

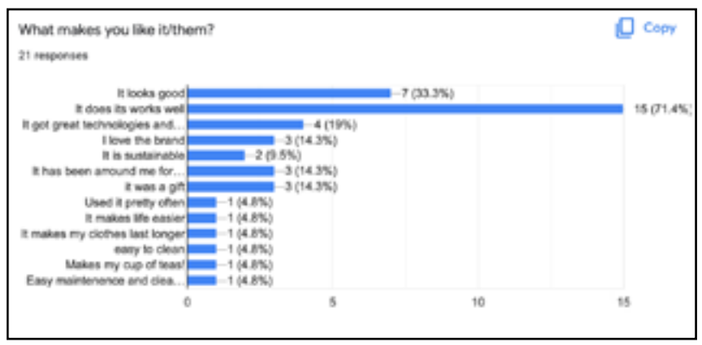
Questionnaire

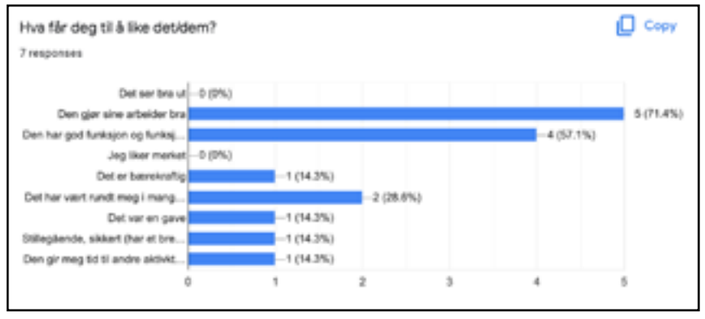
In the questionnaire named My Favorite Home Appliances, which I posted online, in which I asked them to name one home appliance they like the most and list some reasons

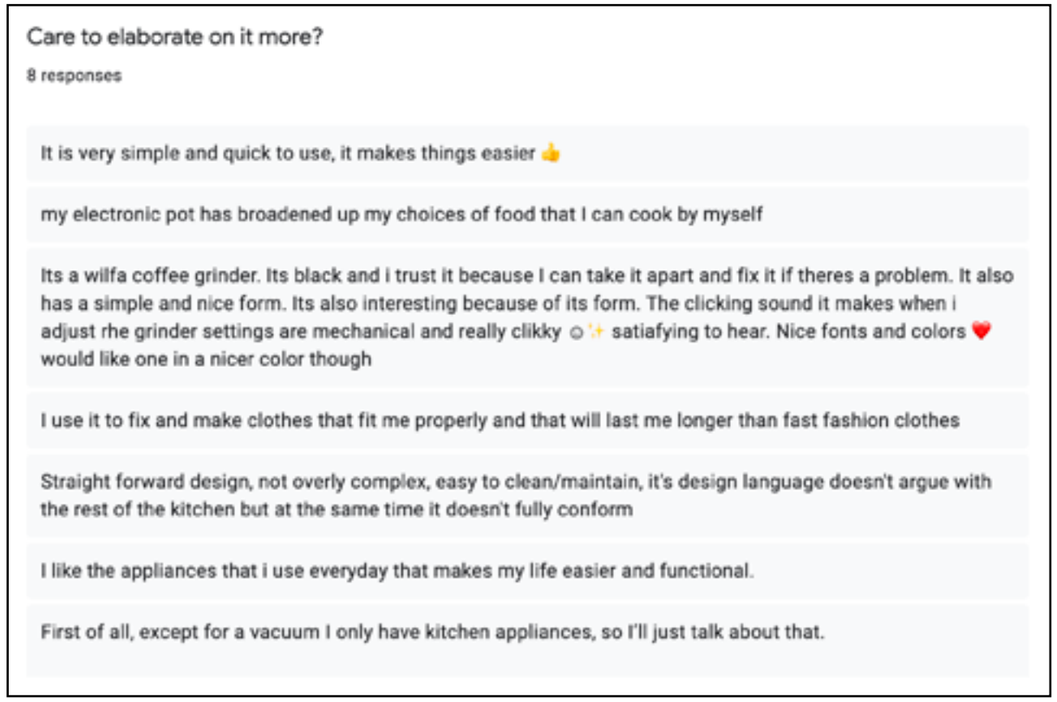












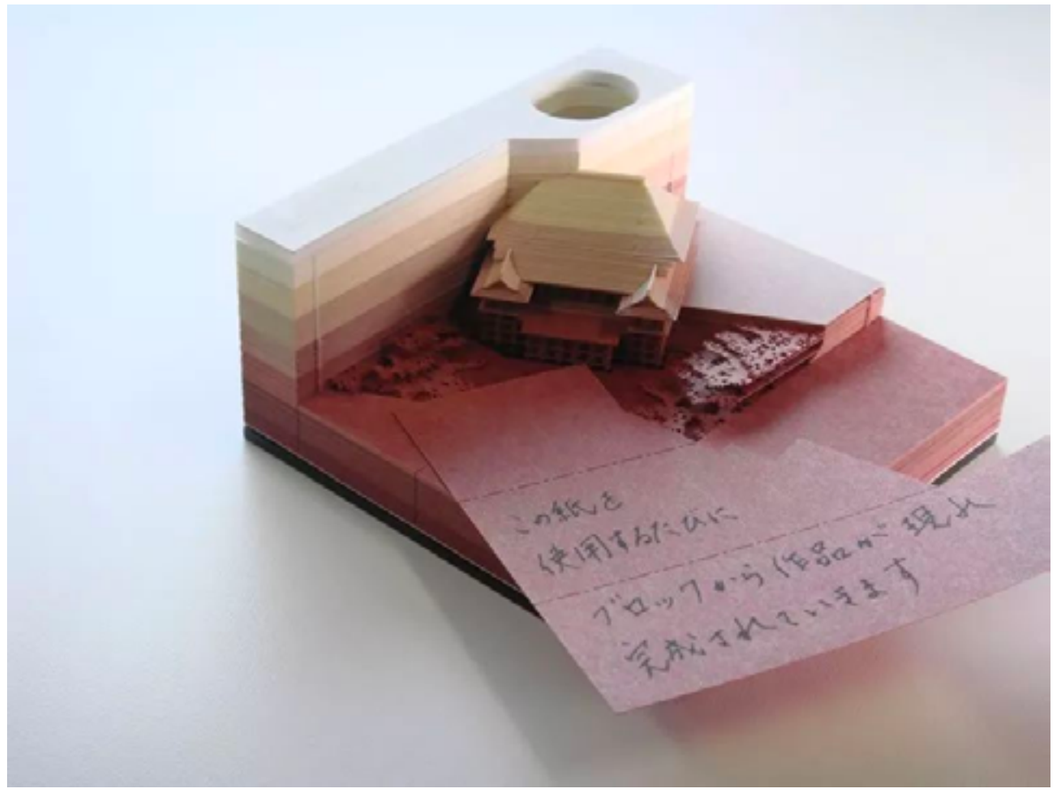
A look at emotional design examples

When research on emotional design, I stumbled upon a lot of good examples. I got great inspirations from some of these products. I found out the designers of these products use some of the design elements to make the product stands out, such as the bizarre shape in Juicy Salif and Alessi wine opener, the sound in the bird whistle kettle, the sense of changing during using the product in the Japanese post-it.

These design elements are not necessary the main purpose of the product, but they give us the sense of playfulness, sometimes they are nicely connected with functions. Like the wine opener with a abstract human shape, but its not just a interesting shape but the arms are the levers and the shoulders are gears.

However, sometimes emotional designs means compromising the functions. Like the Juicy Salif, it is a very controversial product due to the fact it is actually not very handy for juice squeezing. It is unstable and has an inefficient extraction design. So some people say it is more like a expensive sculptural product that fails to serve its function.

For home appliance, I think the emotional design elements should be connected with functions. In the end they are the tools to make our life easier. The product shouldn't be the collection that only in your closet, it should be something that you will use in your everyday life.



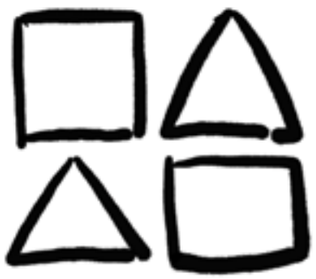
Key Insights

After the research, I got a lot of insights on what makes an electronic product desirable and makes the users like them.

1. An emotional design can come from the good functionalities of the product. In the feedback, users talk a lot about how the functions of the products make their life easier and enable them to do more things. An emotional design can come from the good functionalities of the product.

2. An emotional design can take advantage of our senses to establish a good image of the product and a good user experience. What differs from the functionality, is the appeal that the senses don't necessarily serve the most important functions, but they can create stories and surprising elements which allow users to build memories to the product, and through a certain period of time, it could become a sentimental attachments. However, the design shouldn't compromise the functions. However, as I am discussing the design of home appliances. It is important to connect the design elements with functions, and keep a good balance. Because if the design compromise the function too much, it will become a art and craft product that fail to deliver functions, if the design has little thoughts on the sentimental value but with comprehensive functions, the product might likely to be thrown away after they are broken.

After a discussion with my advisor, I decided to move on with the second direction. "Taking advantage of our senses to establish a good image of the product and a good user experience" I believe there are always home appliances product with good functions, but there less discussion on the importance of the emotional design elements, which can make the product charming and desirable.



An emotional design can come from the good functionalities of the product

An emotional design can take advantage of the design elements like our senses to establish a good image of the product and a good user experience

A art and craft product with sentimental values but fail to deliver functions

A product with good functions but little sentimental value

It is important to connect the emotional design elements with functions, and keep a good balance.

Choose a product

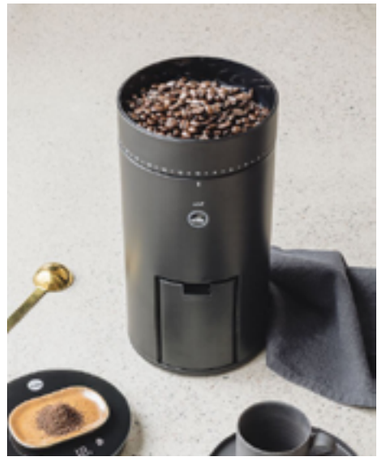
After deciding with senses, I had a conversation with Wilfa and talked about what product I should choose as an example for my exploration. Wilfa has a lot of home appliances products.

However, the electrical coffee grinder caught my attention.

In terms of senses, a coffee grinder has a bit of everything. When you are using it, it produces sounds, smells, and tactile feelings. On top of this, coffee grinder is something people who see themselves as serious coffee person would buy. This makes it has a lot of potential for me to play with emotional design elements.

In terms of senses, coffee grinders produces sounds, smells, and tactile feelings. It has a lot of potential for me to play with emotional design elements.

NB., the category I choose is burr,home-use, electrical coffee grinder. There are blade coffee grinder which also grinds coffee, but they are different types of product.

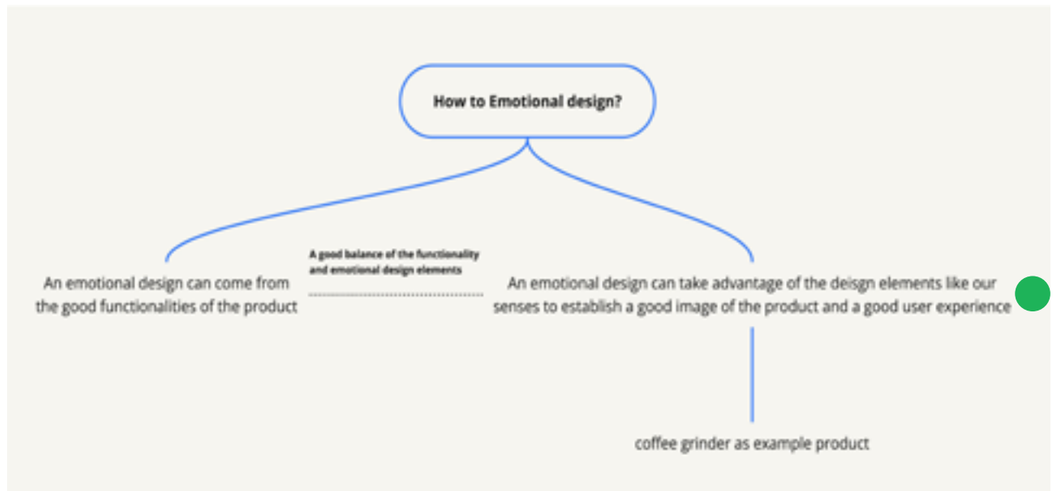


Wilfa Uniform grinder

Wilfa SVART AROMA grinder

Wilfa IL SOLITO grinder

Mindmapping for the choice



The direction I have chosen

OPPORTUNITIES & SCOPE

Opportunities

At this point now, thousands of electrical products have been dumped as they failed to satisfy the user's needs. One way to address this is to make the product last longer. To achieve this, we need to make sure to design the product with good functions, durability, and repairability.
But I see the opportunity to increase the users' willingness, so they put more effort into keeping their product and fixing their product when broken.

Design scope

Explore how to give electric products more sentimental value by taking advantage of our senses. And I am going to use a coffee grinder as an example product to give me the context and frame.

CONCEPT AND IDEATION

In order to narrow it down to a more specific concept to work on, I studied the coffee grinder and defined my user group. After this, ideation through brainstorming and sketches was done before I choose the final concept to work on.

Research on Coffee grinder users

Online research

Through watching videos in which people review coffee grinders. I found out the user group is bigger than I expected. I also understand why they are buying a coffee grinder. Because coffee grinder makes sure you can get more fresh coffee by just-grinded coffee grounds.

User interview

I interviewed two coffee grinder users, during which I try to understand:

1. Their using behaviors. How often do they use the grinder, and what kind of brewing methods do they use.
2. As coffee grinder users, are they any different than other coffee lovers?
3. What kind of associations do they have with their coffee grinders, like the sound, smell, or any other.

Bodum coffee grinder owner
Drink coffee for few years. Likes to try different brewing methods and different roast

Wilfa - Black aroma owner
Start to drink coffee 2 years ago, usually drink a lot coffee a day

My user group

After the research, I narrowed down my user group to coffee grinder users who are a group of people who would appreciate adding a little extra money and effort to get a fresh cup of coffee at home. They see themselves as home baristas, they do experiments on different brewing methods and coffee beans, trying to find out what kind of coffee person they are.

Research on the product

Marketing research


NICHE ZERO


LAGOM P100


FELLOW ODE


ARCO 2IN1


WEBER WORKSHOP


DF 46

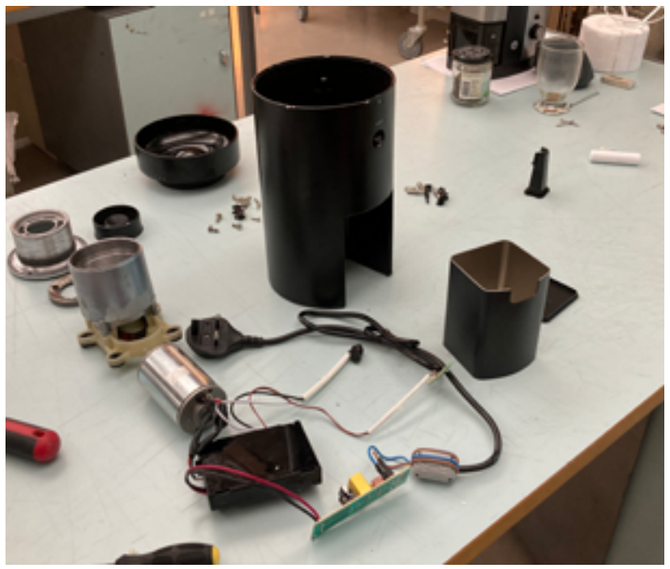

EUTEKA MIGON

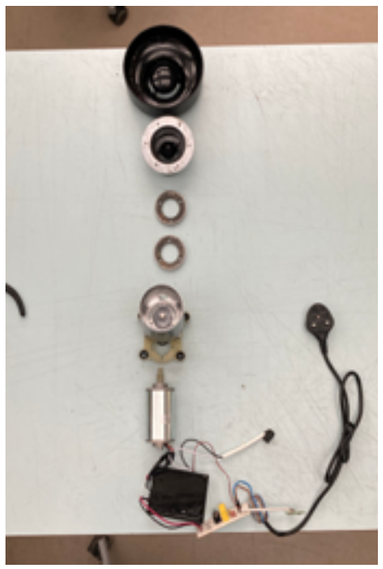

BOODUM

Visiting stores

Testing workflow

Disassemble a coffee grinder

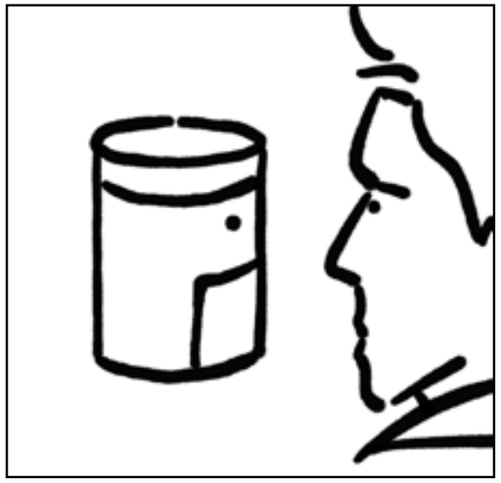




Coffee grinder and senses

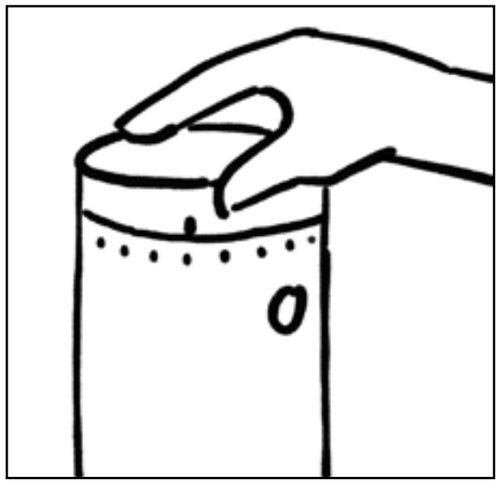
Sense you use when using a coffee grinder

As I was not a coffee grinder user before, I went to the store to see different coffee grinders and bought one to try myself. I note down every sense that I use during the process.

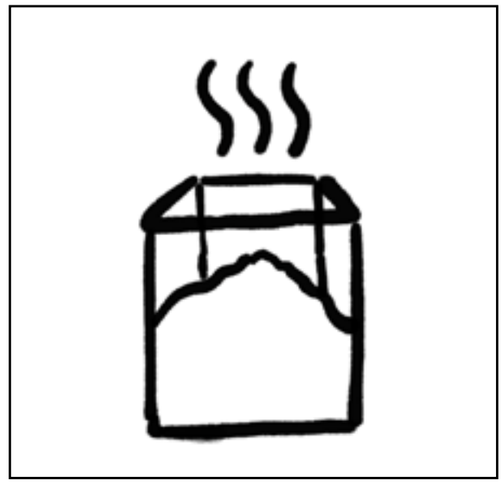


Vision-e.g. The shape of the coffee grinder

Sound - e.g. The sound when grinding



Tactile - e.g. The tactile feeling when adjusting setting



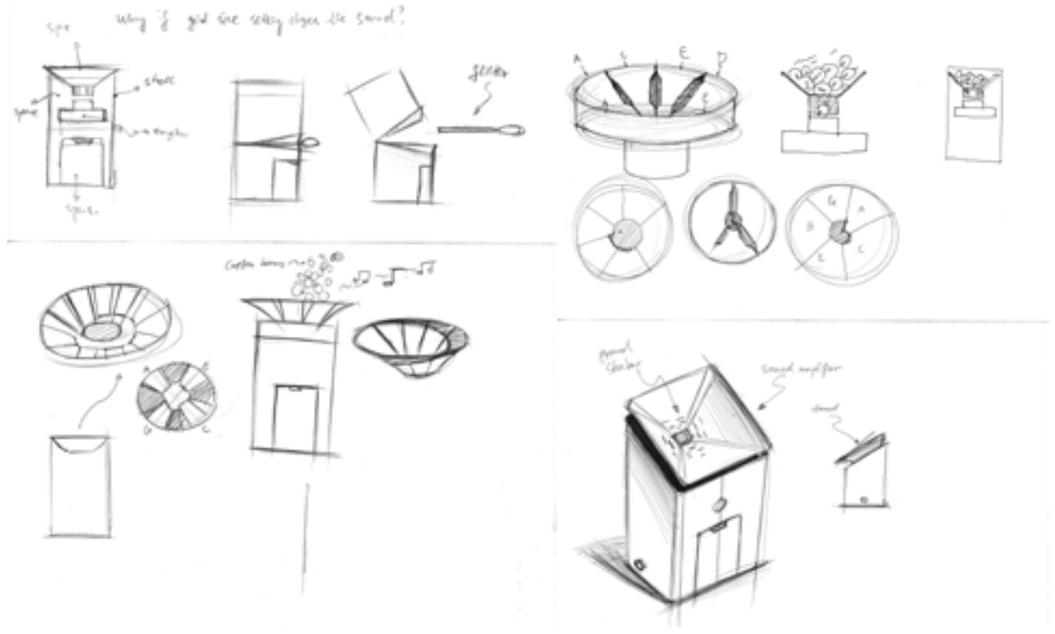
Smell - e.g. The smell of coffee grounds

First ideation

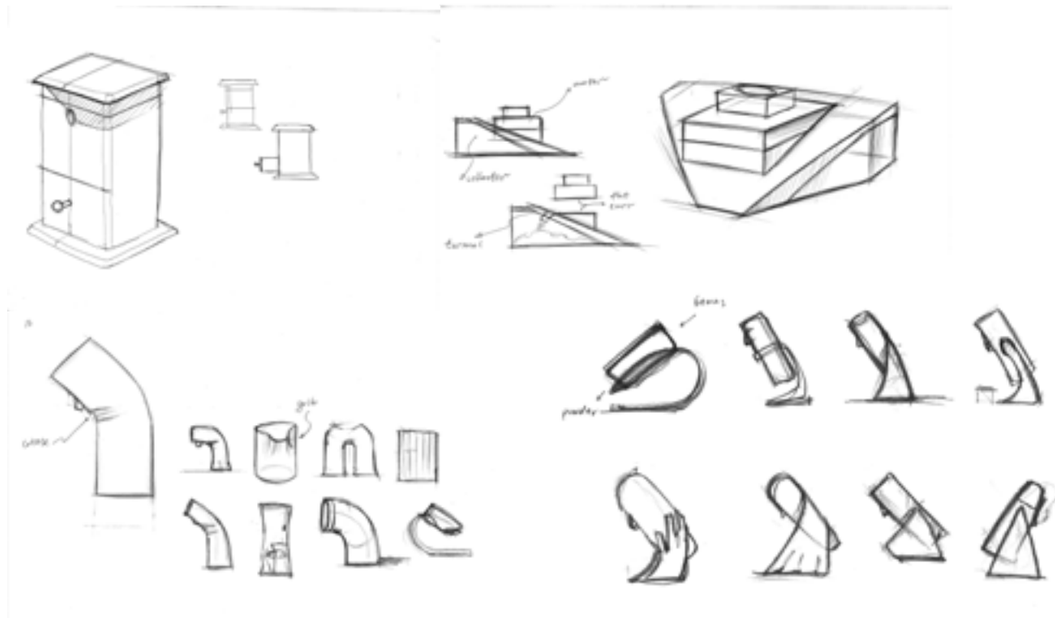
Then, I started to sketch. During this process, I opened up my thoughts on how to use the senses to make the product and user experience interesting.

After showing sketches to my advisor and other people, I decided to move on with sound. During coffee grinders design, the visual, smell, and tactile elements are frequently evaluated and there are multiple examples in the market. However, the sound discussion is few. The most common one is to make the grinding sound volume low, so it's not noisy.
The opportunity for the sound is clear for me. Sound can bring up people's memories, it is a powerful tool to build connections, and sound can convey the quality of the product. What's more, I want to bring up more discussion on sound.

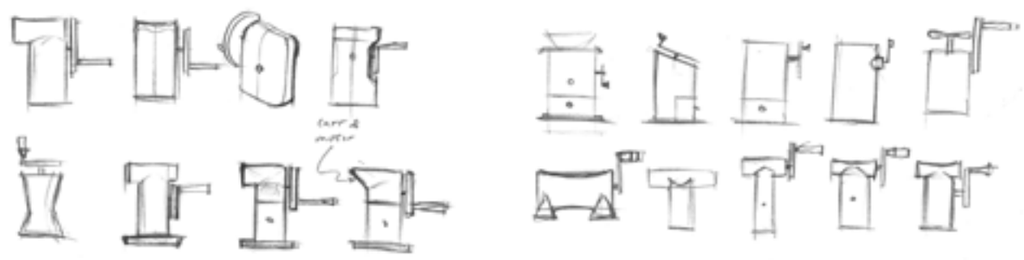
Sound



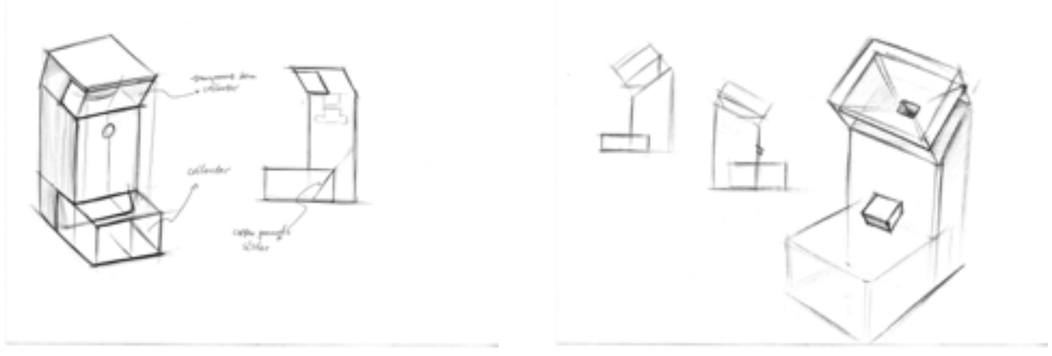
Vision



Tactile



Smell

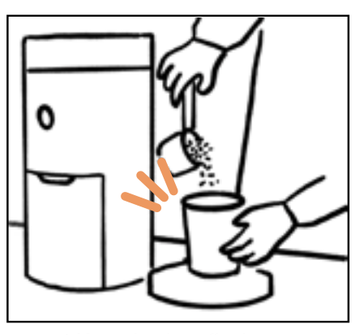


Although I came out some sound idea in the first ideation already, I realize there are far more sounds in the coffee grinder. So I decided to open up the sound a little by second ideation where I focus on the sound.

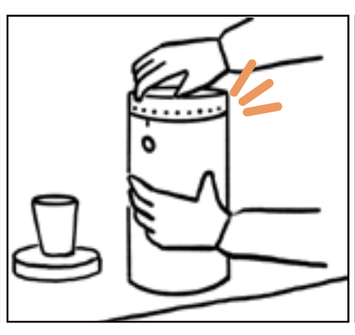
Coffee grinder and sounds

Sounds of a coffee grinder

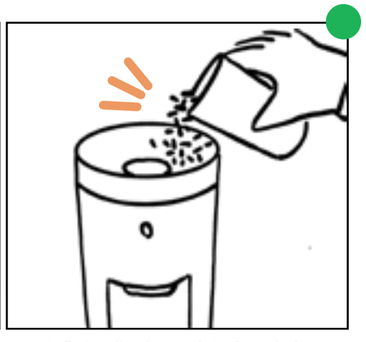
A closer look at what kinds of sounds a coffee grinder makes has been done. I tried Wilfa's coffee grinder Uniform and noted down all the noticeable sounds.



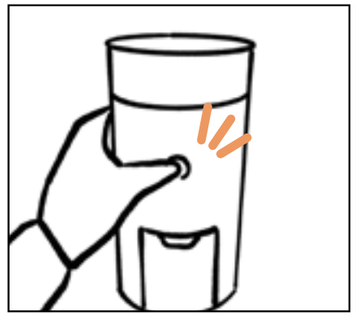
1.Measuring the coffee beans.
The bean hit the measuring cup



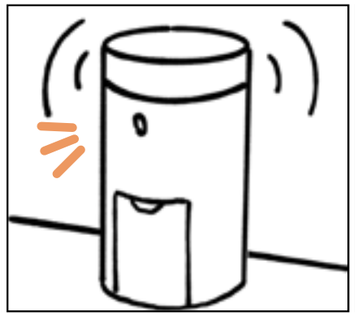
2.Adjusting the grind settings
The clicking sound when adjusting settings



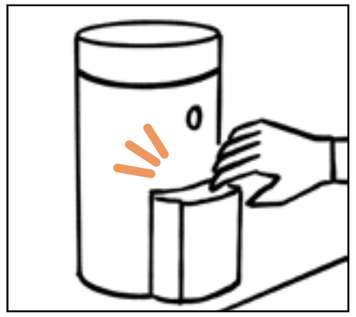
3. Put coffee beans into the grinder
The funnel sound



4. Push the switch button
The switch button makes sound



5. Grinding
The grinding sound



6. Take out coffee grounds
The collector makes click sound

Where the sound happen

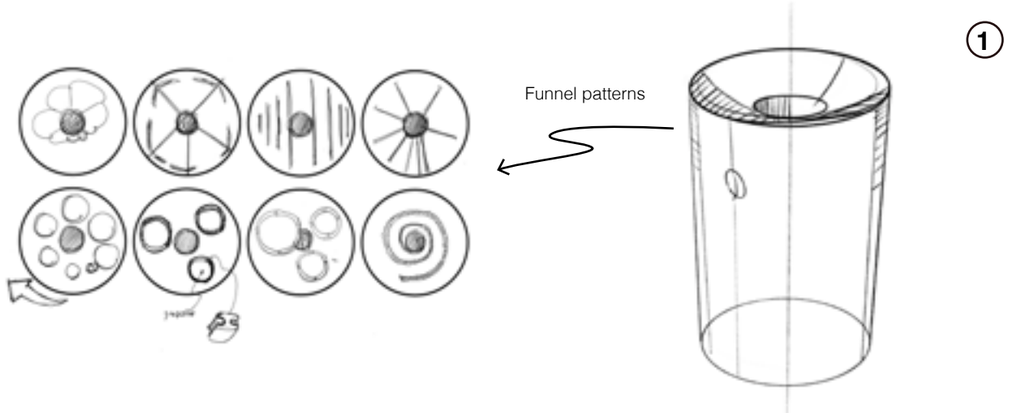
There are a lot of sounds that a coffee grinder make, in order to dive deeper later, **I decided to focus on one sound, so I can make a prototype that works and I can do user test with it. I see more opportunities in the bean-pouring sound.** I have more playgrounds with the sound, and I see opportunities to connect the sound with grind settings.

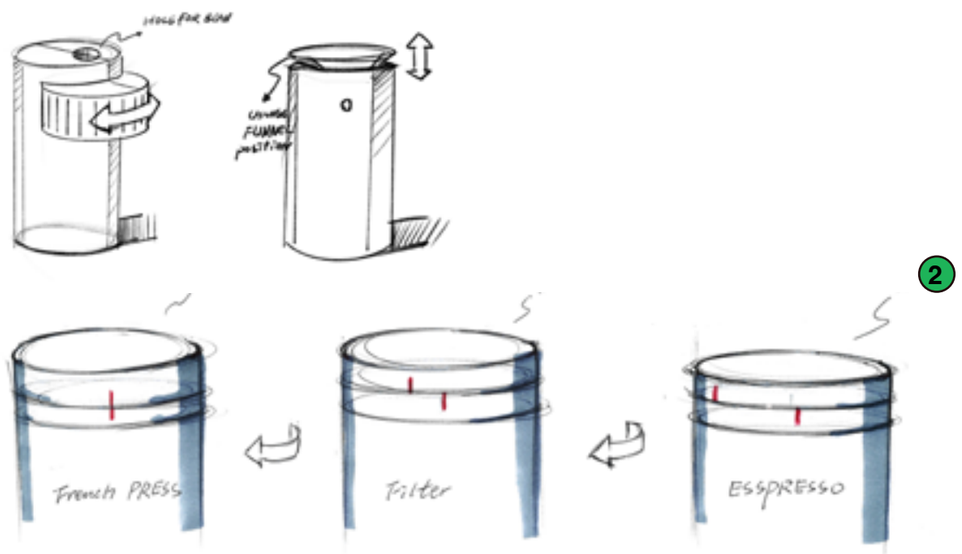
Although the grinding sound is the most dominating sound when using a coffee grinder, and it's from the burr grinding with beans and the motor rotating at a high speed, to design the grinding sound, there should be more engineering practice.

Second Ideation

I then did sketches on making the funnel sound more interesting. I has two ideas

In the first idea, I wanted to created patterns to make the pouring sound interesting.
In the second idea, the pouring sound will change as the settings change.





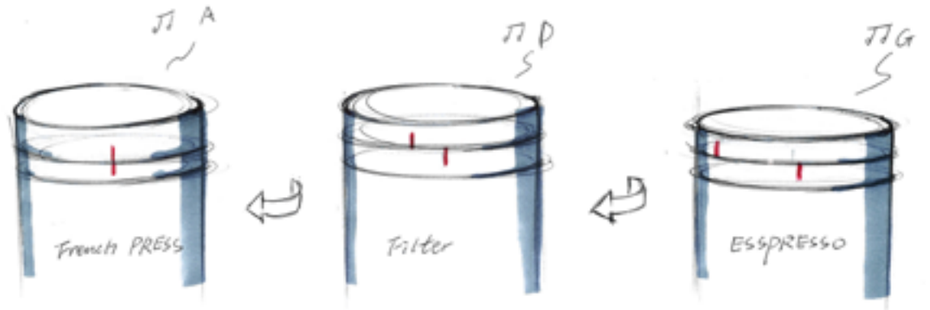
Final idea

After discussing the sketches with my advisor and fellows in the class, I decided to go further with this idea.

The final idea is: Different funnel sounds in different settings.

Different grinding settings mean how fine you want the coffee grounds to be and what kinds of brewing methods you are using.
From the previous conversations with coffee grinder users, I am inspired by how they like to explore and do experiments on different brewing methods, and try dark or light roast beans.

So the grind setting is more than just grind different size of coffee ground, but also in some way decide how you want to start the day with a quick black coffee from the filter or french press, or a fine latte from an espresso machine. So with different sound feedback in different settings, users can build connections during the time of use. And this can happen unconsciously or the other way.



PROTOTYPING FOR SOUNDS

I found out to work with sounds, it is important to audiolize the ideas with mockups. Because you can't predict the sound on papers.

So I did experiments on how to make sound first to have basic knowledge of sound design

In the first iteration, I generated as much as mockups I can to have better chances to get the sound I want.

In the second iteration, I connected the selected ideas with the coffee grinder by some thoughts on the engineering.

Experiments on how to make sounds

I have done many experiments on how to make and manipulate the funnel sounds along the way of making prototypes.

In these experiments I gain insights on:
1. How to make different pitch with same materials.
2. how to control the sharpness of the sound.
3. how to control the sound
4. how to soften the sound

Materials and funnel patterns testing

Attachment testing

Sketches for the first iteration

I have sketched 7 ideas for the first iteration. **They are all my assumptions with how would the sound would be,** this is why i need to make prototype to test out. This is also why I want to make many prototypes later

1. **Acoustic space.** Inspired from drum set. By changing the volume of the funnel, the pouring sound will change.

2. **Tunning fork.** By having the shape like a tunning fork, you can have retention in the sound which can be adjusted by dampers.

3. **Bell ringing sound.** By having the shape like a bell, you can have retention in the sound which can be adjusted by dampers.

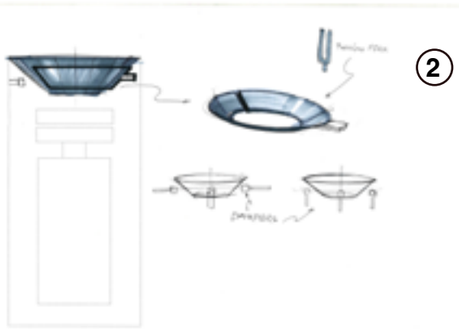
4. **Two layers of different materials.** By controlling the distance of two layers of different materials, the timber (sound quality) would change.

5. **Sound pitch.** By controlling the position where you pour the beans, you can adjust the sound's pitch with the spiral pattern in the funnel.

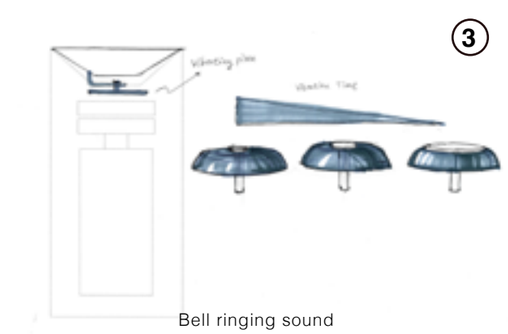
6. **Sound sharpness.** Use the same structure of the 5th idea. But arrange materials with increased hardness in the funnel, you will get increased sharpness of the sound.

7. **Loudness.** Use the same structure of the 5th idea. But arrange different size of soft material in the funnel, you can adjust the loudness of the pouring sound.

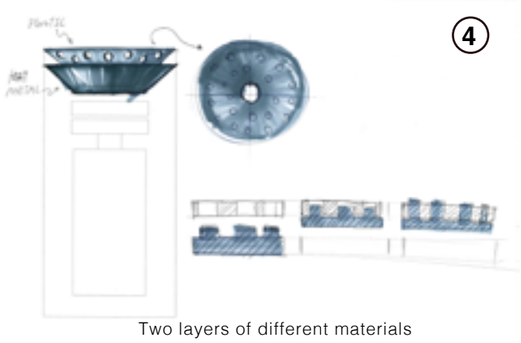
Acoustic space



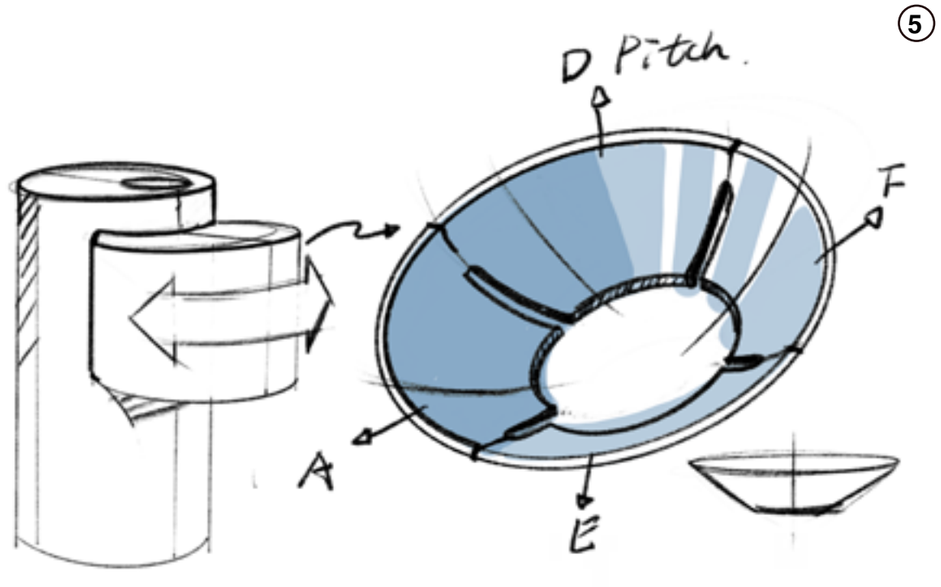
Tunning fork



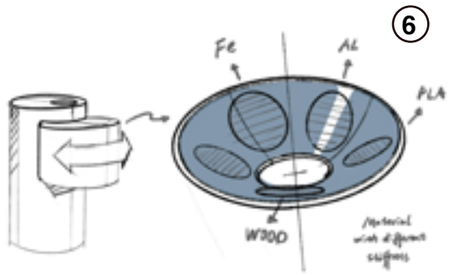
Bell ringing sound



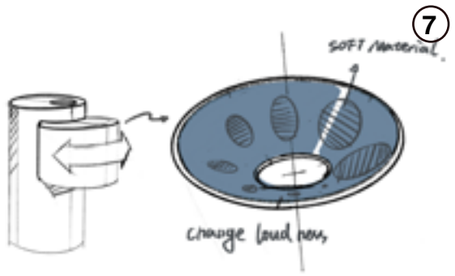
Two layers of different materials



Sound pitch



Sound sharpness



Loudness

First iteration - 7 mockups

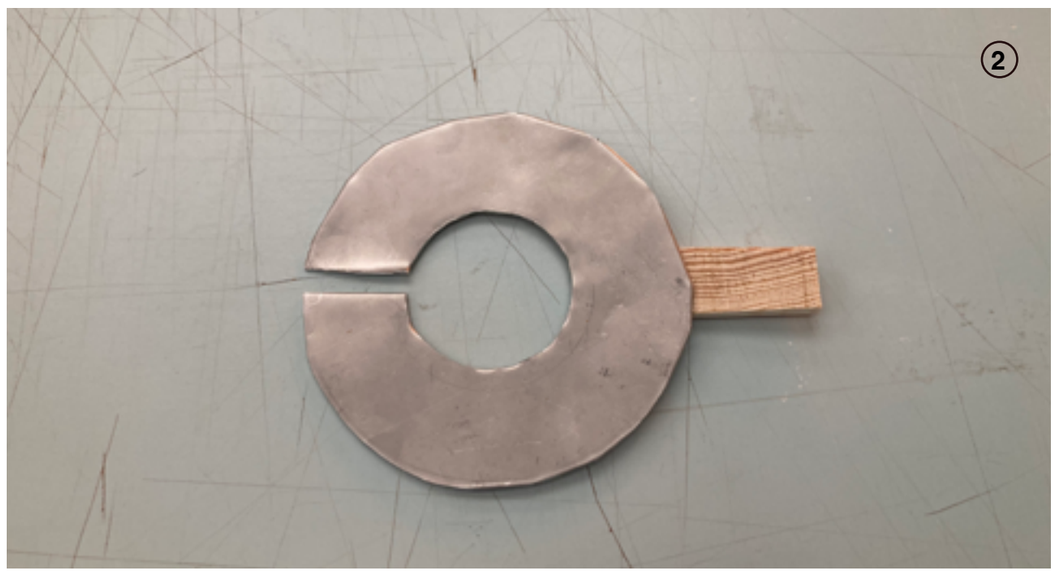
I made 7 mockups with the sketches. Then I did dropping test with coffee beans, while recording the sound.

After this, I play the sounds to people. Them what do they think about the sound and if they can tell the change of the sound in each mock up.

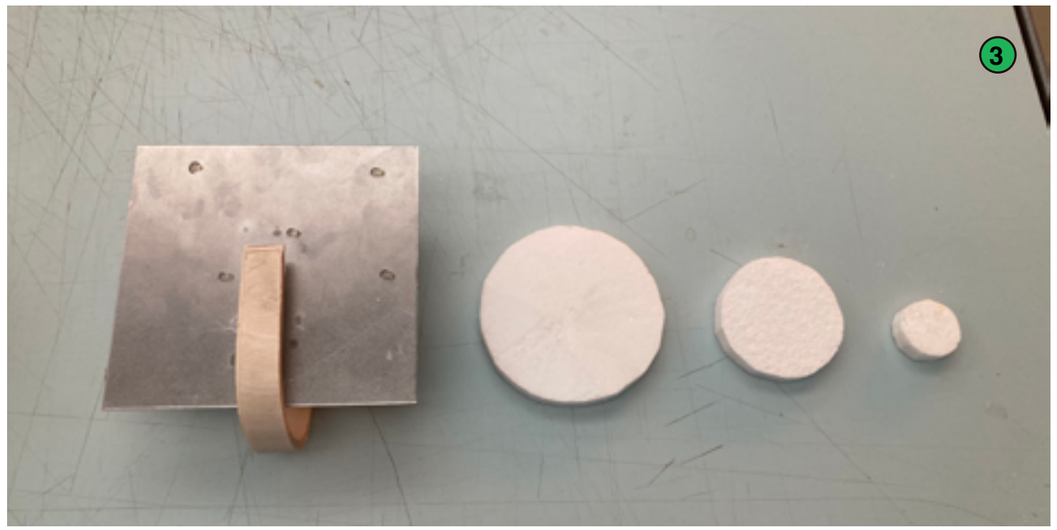
I then choosed the Concept 3,5,6 to do the second iteration, basic the following criteria:

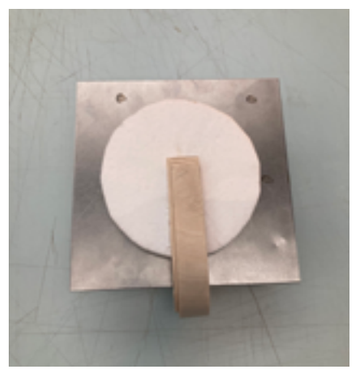
1. If testers can tell the difference of the sounds
2. If testers like the sound
3. It it is viable to further prototype

Acoustic space

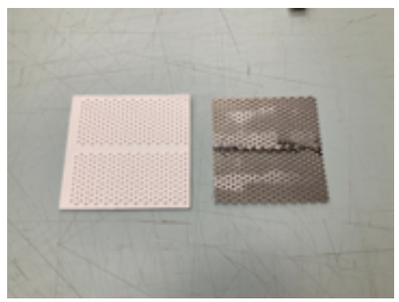


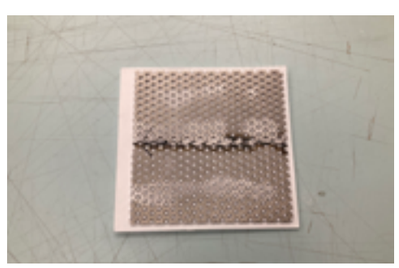
Tunning fork

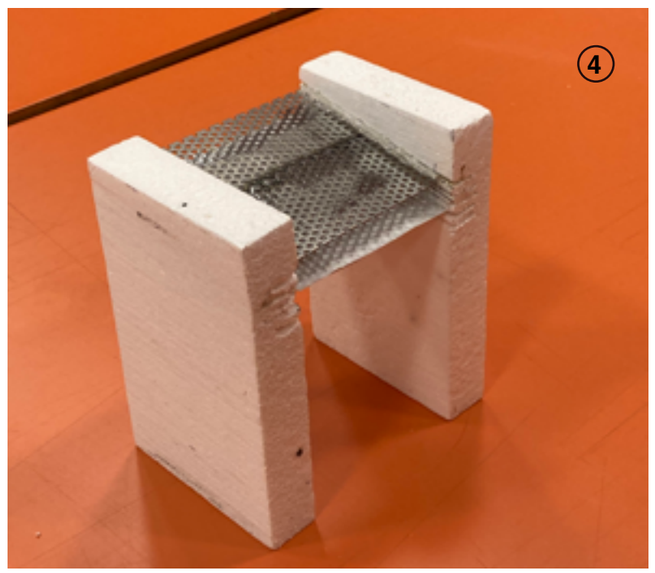




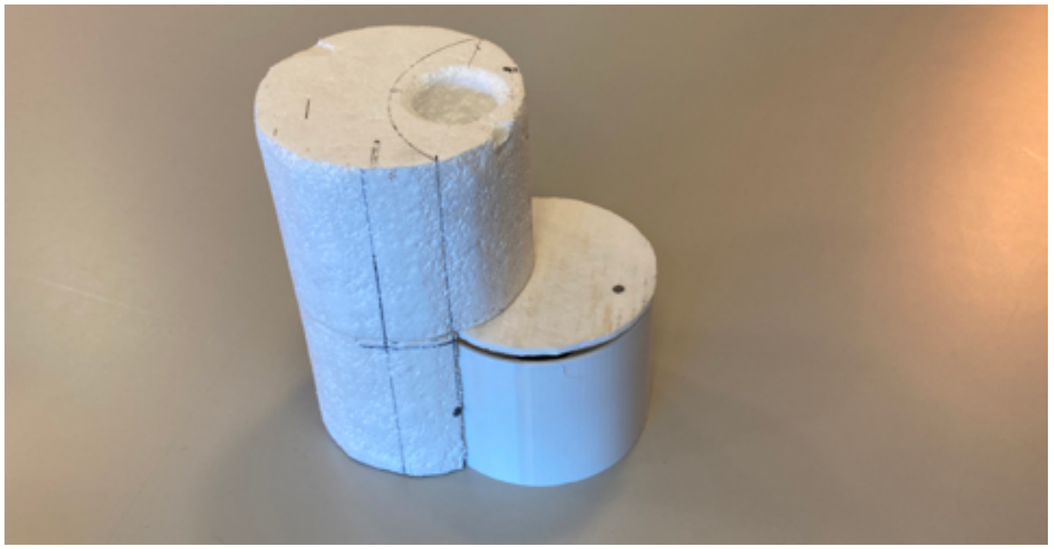
Bell ringing sound

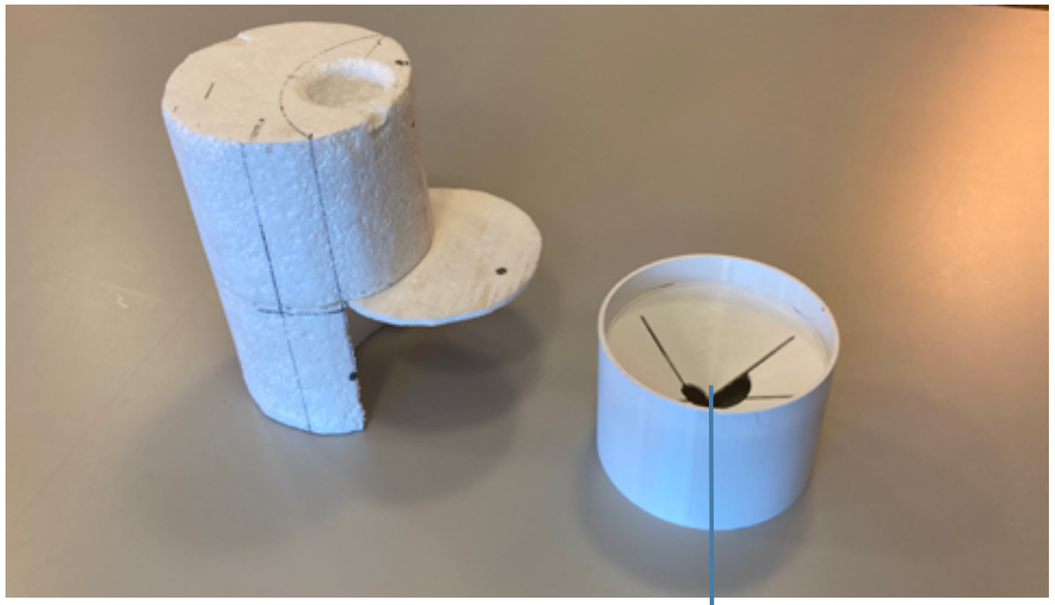






two layers of different materials





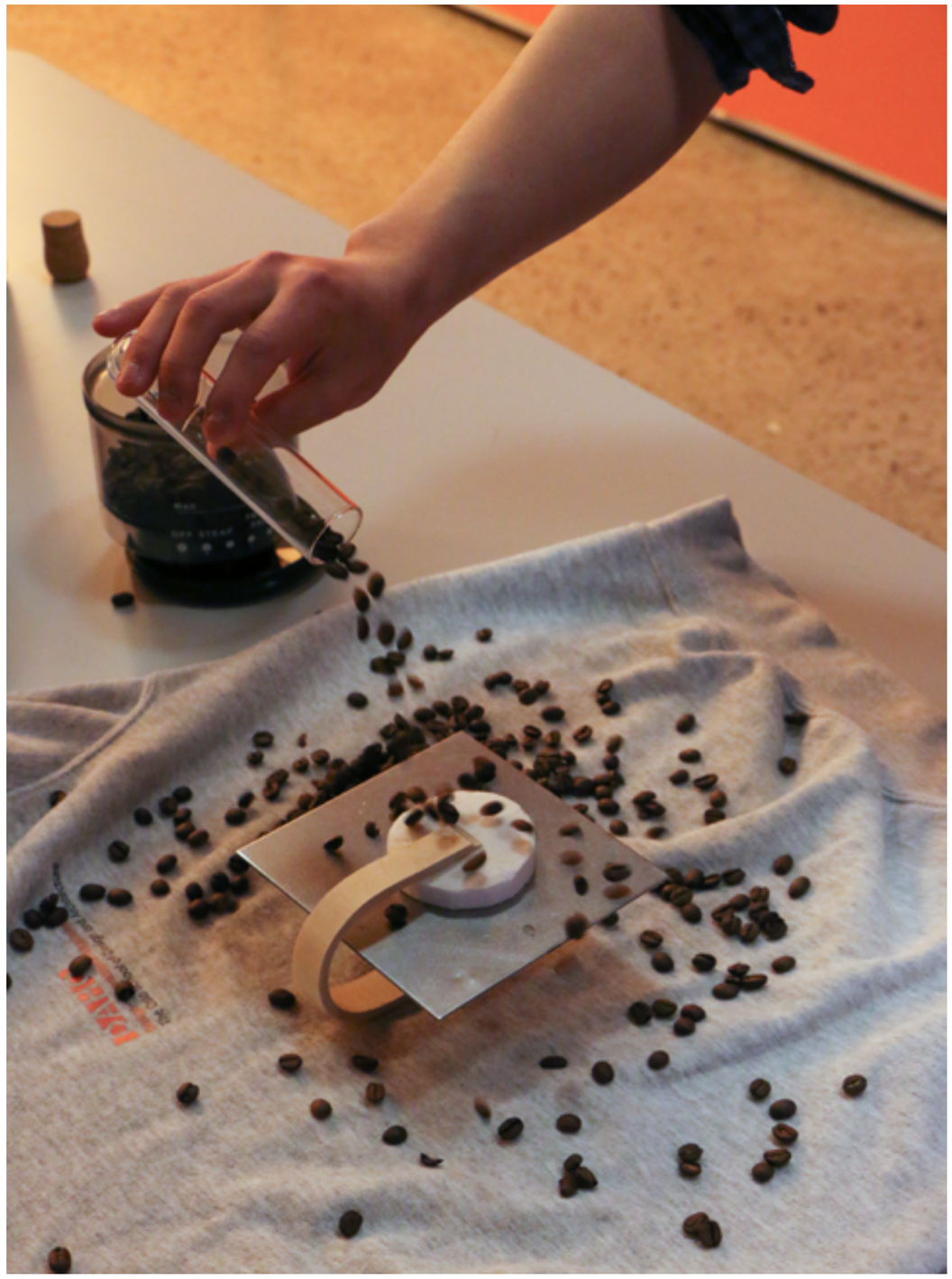
Sound pitch

loudness

Sound sharpness

Dropping tests

This how I test the sound of the mock up.
When pouring coffee bean on each mockups,
I used my iphone record the sound.



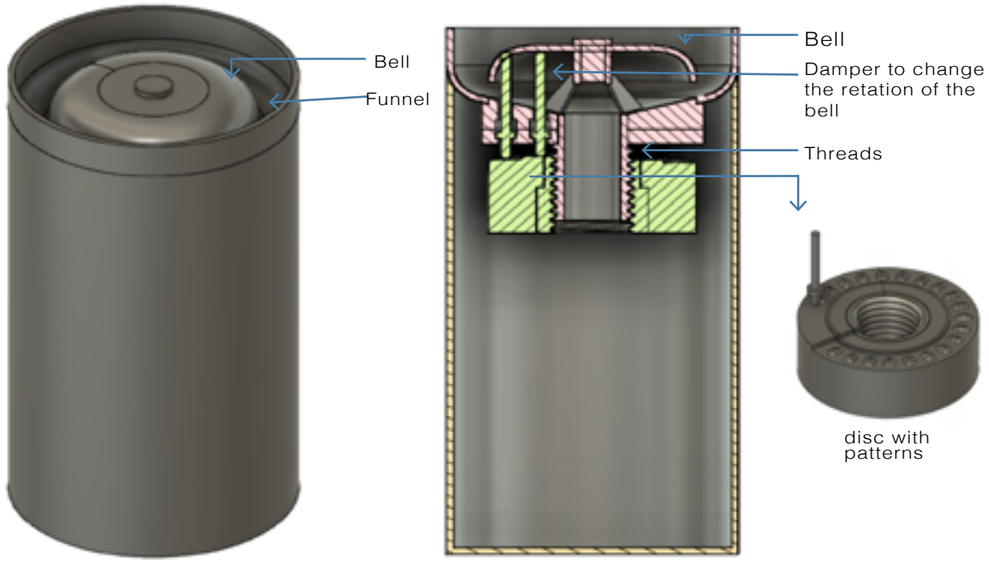
CAD for second iteration

In the second iteration, I tried to connect the ideas into the coffee grinder. In this process I need to consider:

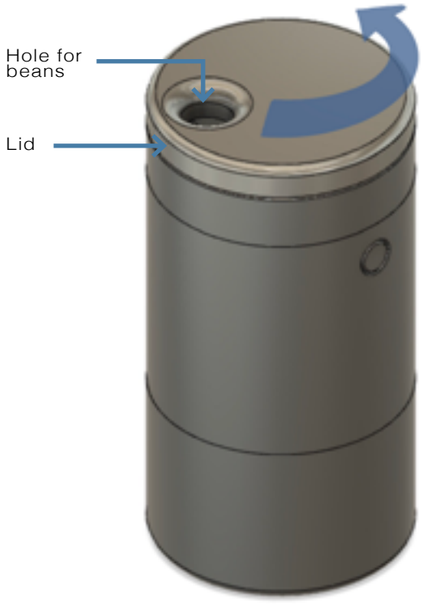
1. Where to place the design in the coffee grinder? How would it effect the functions?

2. How to make the difference in the sounds even more clear?

①



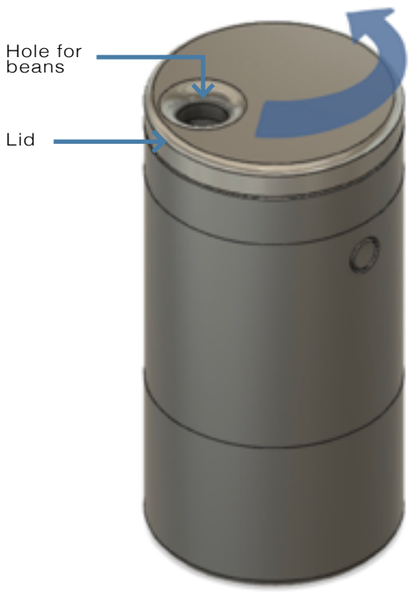
Ringing bell



Sound pitch

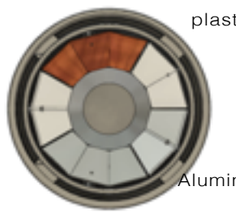
②

Sound panels with different size



Sound sharpness

③



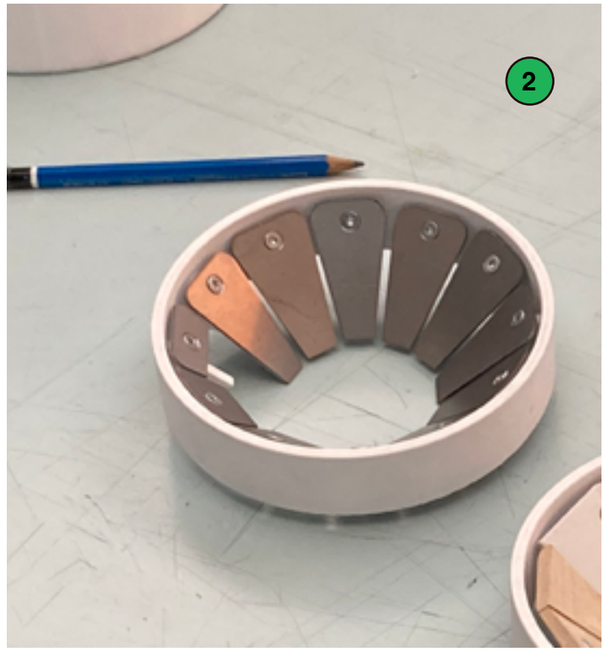
Sound panels with increased hardness, so they sharpness of their sound feedback increased.

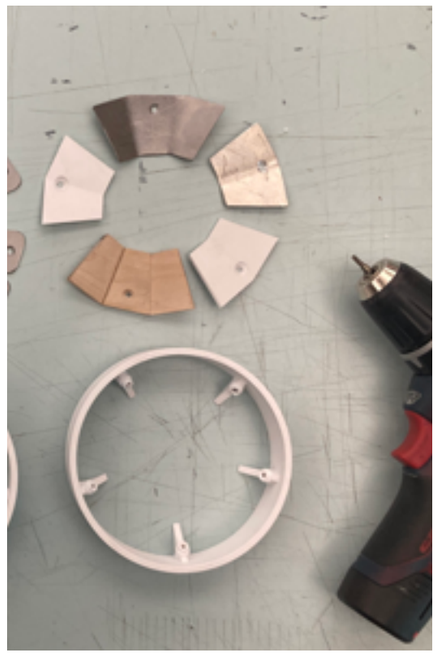
Second iteration - 3 mockups

I then made the 3 mockups. After this I did dropping tests with them.

Idea 1 put too much importance on the engineering. The mechanism gets too complicated. Also to realize idea 1, I need more precision on prototyping all the way to 0.5mm. So it is not viable anymore to prototype.

I decided to move on with idea 2 and 3 for the final prototype, because idea 2 is conventional and idea 3 one is radical, this gave me chance to test out how big the boundaries are in this concept. For idea 2, it makes sounds with different pitch but in same sound quality. For idea 3, it produce sounds with increasing sharpness, and the difference is more different than idea 2 as it uses 4 different materials





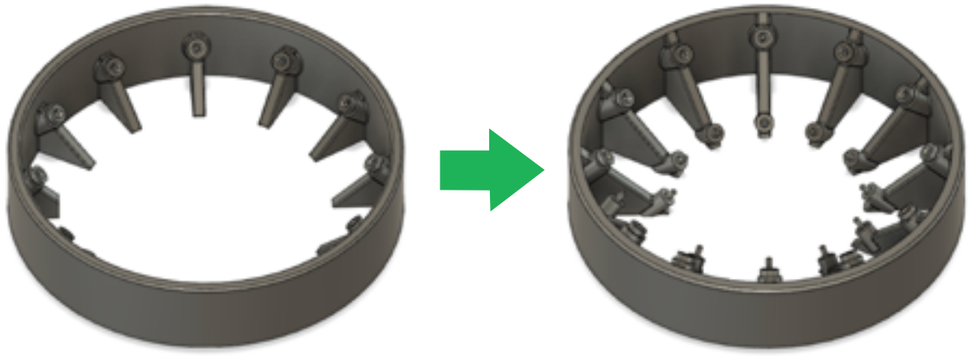
Third iteration - final tunning

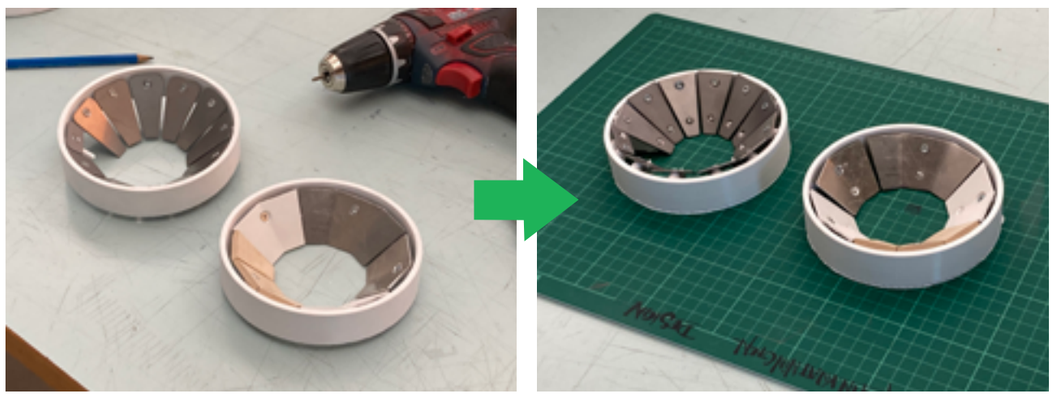
I showed the two prototype to 4 people and get feedback on the sounds changing is still not too clear. so in the third iteration, I did 2 changes.

1. The attachment of the materials. The material now is attached in a loose way but at same time it won't move too much, It is inspired by xylophone.
This ensures the material vibration and produces the ''true sound'' from the material. It also helps to make the sound more

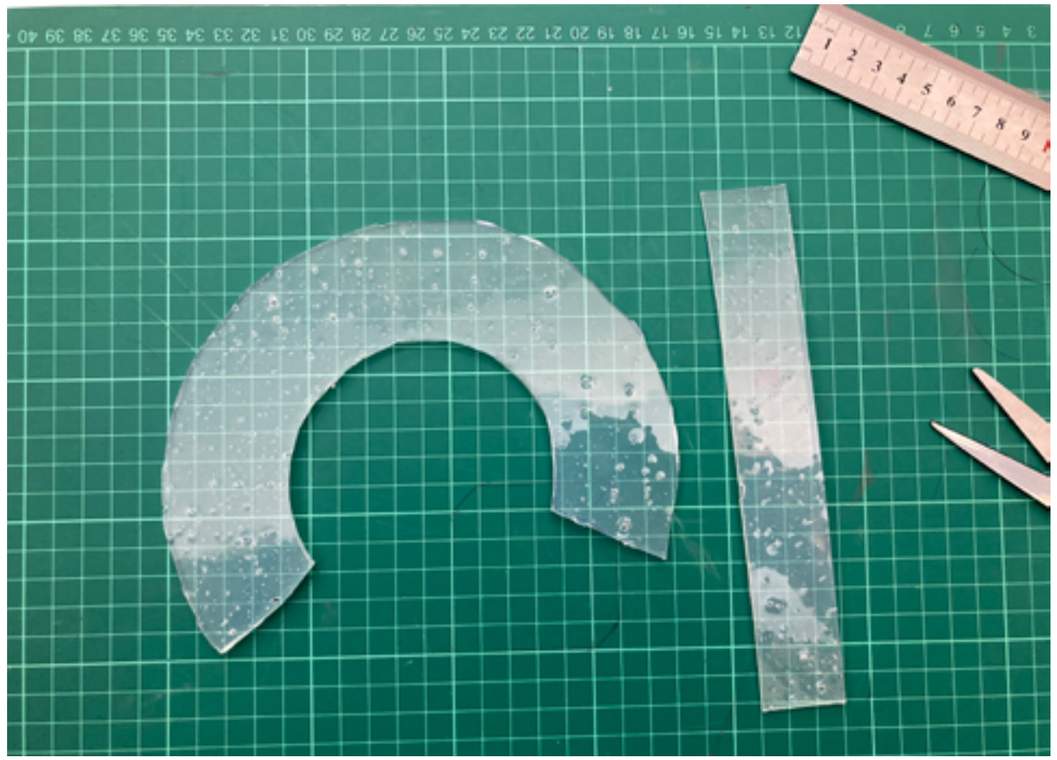
2. Reduce distracting sounds. The sound from the sound panels are distracted by other sounds from the sound tunnel, the space below the funnel. So I added a thin layer of silicone, which helps to reduce the distracting sound. But of course, in a real product, this soft layer should be more considered, like rubberized layer.

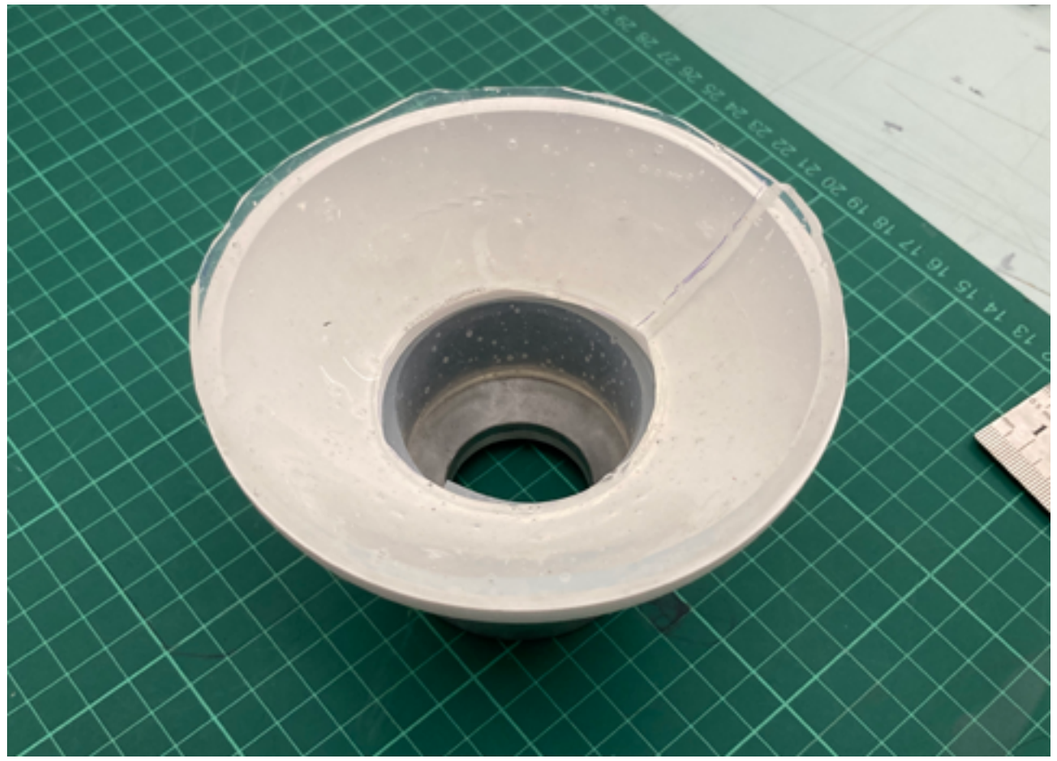
Adjust the attachment of the materials





Reduce distracting sounds





FINAL PROTOTYPE

ONE SHELL, TWO IDEAS

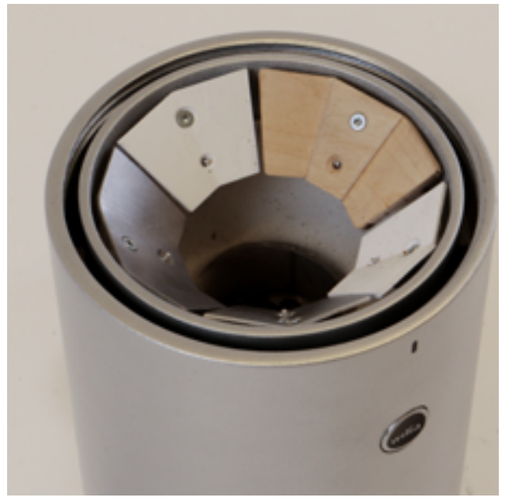
I decided to move on with 2 ideas for the final prototype, because one idea is conventional and the other one is radical, this gave me chance to test out how big the boundaries are in this concept.

One shell, two ideas

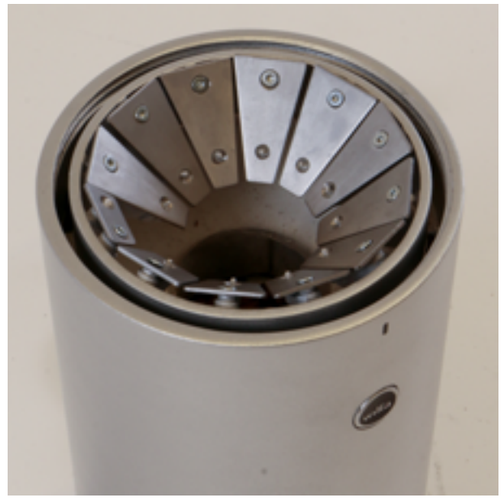
The two funnels can be exchanged on the shell, so I can test the two ideas.

Idea 1 - Radical Mix. The bean pouring sound get more sharp as the settings get finner. The funnel has 4 types of materials, wood, plastic, aluminum, and steel.

Idea 2 - Spiral steel. From the lowest grind setting to the finest grind setting, the bean pouring sound gets higher in pitch. The funnel is made of a circle of steel panels. They are in a gradient size, so they can produce sound in different pitches.



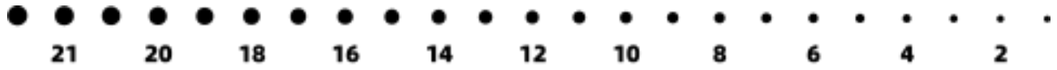
Idea 1 - Radical Mix



Idea 2 - Spiral Steal

Grind settings

From 21 to 1, the size of the coffee grounds you will get become finner. It is designed for 4 types of brewing methods.



0-6 Steap

8-12 French press

13-17 Filter

18-22 Espresso

Reduced distracting sounds.

After the coffee bean hit the funnel, they will enter the bean tunnel. The tunnel is covered with silicone, so there would be further sounds other than the funnel sound.

High-fidelity context.

To give testers more context, the prototype was made to a high-fidelity level. The prototype has a satin metal finishing. It can not grind beans, but it is filled with grinder components inside, so it weighs the same as a real one, this makes it feel like a coffee grinder.

How does it work?

When changing the grind settings, the user needs to rotate the lid. But at the same time, you also change where the coffee been hit the funnel. That's why it produces different sounds in different settings.

By creating interesting sound elements into the design, the design is created for users to build memories with this coffee grinder, through a certain using period.

The sound design is connected with the function - grind setting. This is created to make the design elements more than just a playful or surprising element, but something users can have some thoughts on, and something has the potential to stand the test of time.

The ultimate goal is to create an emotional bond through the sound and increase the potential of the product to be used for a longer time.

See the video of the two ideas

https://youtu.be/x3eYAiZHdmk

USER TESTING AND FEEDBACK

As I finished the final prototype, I then did user tests.
In the test, it is very important to me to find out how would the design effect their emotions with the product.

I also presented my final idea to Wilfa to get their feedback.

User testing

I did 10 user test to find out how following questions:

1. How is the design going to affect users' emotions to the product?

2. Do they see the potential of this idea in a electrical product designer for lifetime?

3. Can they tell the sound differences? For both 2 ideas?

3. Do they like the sounds?

4. Which idea is better? What does it mean?

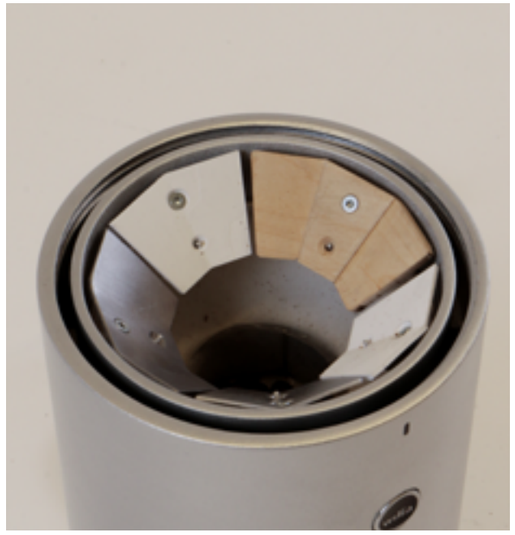
Radical Mix - positive feedbacks

One tester told me he can’t stop smelling when trying this. ‘‘It makes unexpected sounds for a coffee grinder, especially the wood’’

One coffee grinder users think the arrangements of the materials really explains the grind settings. Like ‘‘ the wood sound reminds me the cabin’’ hence the Kokekaffe, and the sharper sounds fit into the image of the finner settings which has less tolerance.

‘‘This design is a elegant solution to avoid that I am in the wrong grind settings ‘‘ One coffee grinder user told me as he sometimes found himself in a unwanted setting after the beans has been grinded.

‘‘ It makes me smile by trying this’’



Radical Mix - critical feedbacks

However, there are comments on the sound resolutions. There are 4 different sounds in the Radical Mix, and they change in a rather abrupt way.

so testers wished there could be more different sounds to define the settings. With more sounds, the better the grind settings is interpreted by the sound.

‘‘ I wish there can be even more different sounds’’

Spiral steel - positive feedbacks

Most of the tester think the sound from this idea is instrumental, the sound gave them a ‘‘Wow’’ effect.

Most of people think the differences from this idea is more clear to them. ‘‘ I can really hear the pitch is going higher’’

Testers also recognized this idea is inspired by xylophone. ‘‘ This makes me fell smart’’

The form factor is also something people liked about. ‘‘It looks like the classic golden spiral.’’ And ‘‘the sheet metals give them a very industrial feeling.’’

‘‘ It is a unique design that makes me feel smart

Spiral steel - critical feedbacks

There are also testers couldn’t tell the differences of this idea that well. Spiral steel produces different pitches, so one of the users told me that she could forgot how it sounds tomorrow.

‘‘ I could forgot how it sounds tomorrow’’

General feedback

In the test, I ask them ‘‘What do you think this design would effect you emotionally, do you see the potential to have a memory or a bond with this coffee grinder?’’
As expected, no one could gave a clear answer. Because its something you really have to use the product for a long time to know. Some told me ‘‘ It will help me to like and keep product, but the function and the repairability goes first if I am going to use it for a long time.
There is also a user who told me, this design is unique and no one else has, so this would emotionally make her somewhat proud, especially showing this to her friends.

For the using experience, testers gave insights on how to improve the existing prototype.
1. The cup to hold and measure the coffee beans should not make too noise as it might distract users from the funnel sound.

2. You pour the beans differently every time, a bit faster or slower, so the sound can be different even in the same setting.

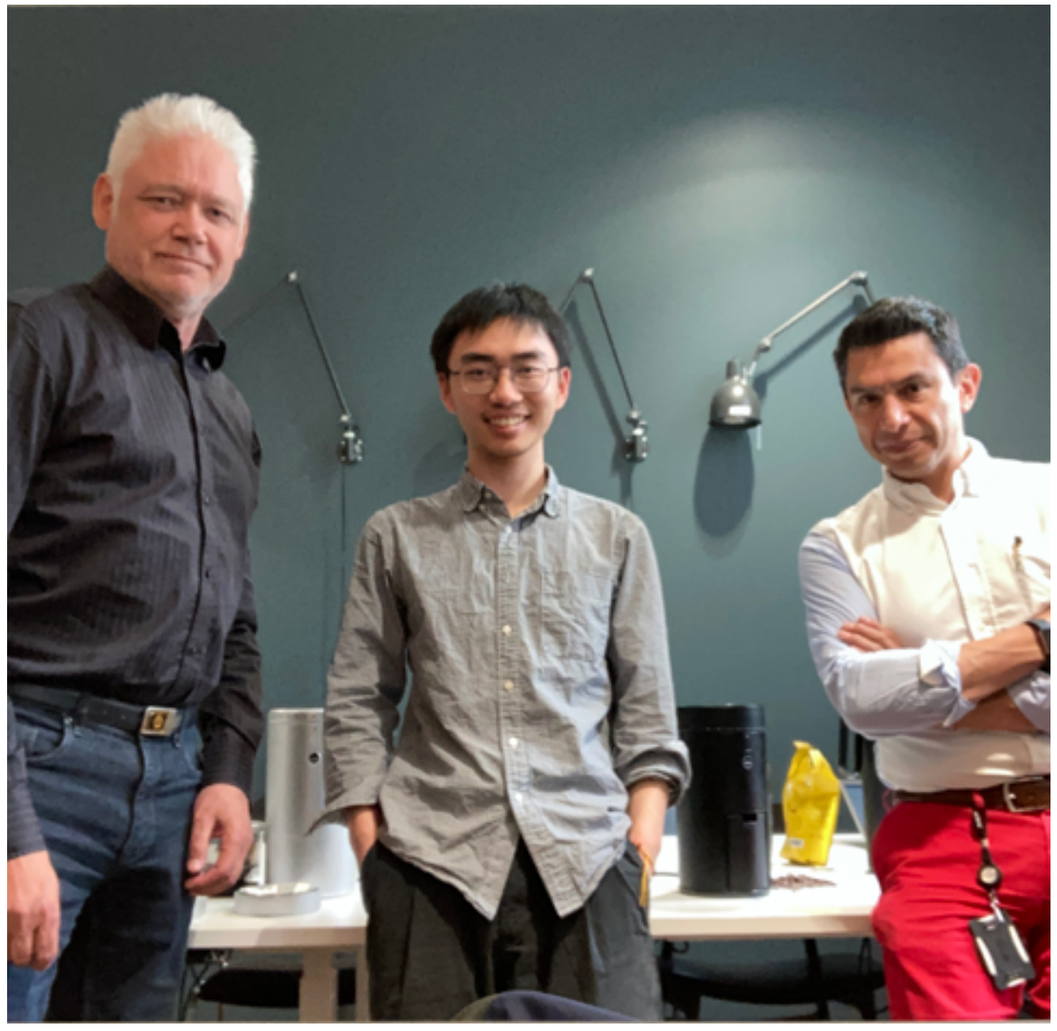
3.Maybe the funnel should be reveled with a transparent lid, because the form factor is also very interesting.

Conversation with Wilfa

I brought my prototype to Wilfa’s office and introduced to Kitil tangedal the technical director and David Vilchis who’s responsible for coffee product in Wilfa. At this conversation, I was eager to hear:

1. how do they see the emotional value this design will create?

2. How Wilfa as a brand would see this idea ?



Feedback

Ketil and David understand the emotional value the design will create. They think it is important for them to have new ideas like this to raise discussion of how to make home appliance better for the sustainable future.

“ A refreshing idea.”

“Check the box for emotions.”

As engineers, they raised a lot of questions like how to change the metal to plastic as it is cheaper for production, and as this design has lots of components, you will need more assembly for production as well.

Furthermore, David challenged me to ‘‘make the sound experience more consistent’’ by consider all of the sounds from the grinder and not only the bean pouring sound.

CONCLUSIONS

Does it work?

After user testing and feedback from Wilfa, I see the potential of the design as something that can add sentimental value to the coffee grinder.

First of all, the sound did provide surprising effect to the using experience, as the design is not shouted out as a ‘’flagship feature’’, the users get unexpected sounds when they pouring the beans.

Secondly, the sound is connected to the functions. The sounds doesn’t provide the most important functions as a coffee grinder, but they interpreted the grind settings, other than just visual notes. This ensure a multi-sensory experience, which helps to build up memories of the product.

However, it is important to mention that to reach the goal of creating long lasting product. There should be both engagements of functionalities and the emotions. A unforgettable but hard-to-use coffee grinder couldn’t serve as long as a normal grinder with good functions. A good-to-use coffee grinder couldn’t reach to its full potential if its not liked by the users.

The Radical mix

I think the radical mix shows the most potential idea in this project.

Because the sounds from it interprets the grind setting well, with the wood, plastic and metal, sounds, it gives more context to what does the setting mean.

The radical mix gives more distinguished difference in the sounds. With different materials, the sounds feedback change more rapidly. This fits the using of a coffee grinder user. Users don’t change grind settings frequently, so in order to make the sounds more memorisable , the sound difference should be bigger.

REFLECTION

What I have learnt

Looking back to the project, I have gain a lot of knowledge on how to do design explorations. I kept my design choices quiet broad for almost half of the project and then decided to dive in rather deep in the sound. If things could be done better, I would guide the project deeper a little bit earlier in the process which allows me to do have more time to explore later.

I believe I have reached the project goal of exploring how sounds could affect users emotions on the products. The final prototype really allows me to show the concept physically to tester and Wilfa, which for a sound project is quiet important.

I also have better understanding on how to prototype for sounds, which is something I wish I could know earlier, but only know after doing it.

“Sound spectrum”
- Reflection from sound experiments

After this project, I found out if one do not have experience with sound prototyping, The final result can sound very different than expected.

In the prototyping process, I gain a lot of insights on how to manipulate sounds, and what kinds of emotions people have to the sounds.

The purpose of the table is to deliver the reflection of the sound study in this project in a systematic way. And since the sound follows the same physical principle, so hopefully it can inspire other sound designing projects, and raise more discussion.

Sound sources in this project

In this project, I am exploring how to make the bean pouring sound from the coffee grinder interesting. So the sound source I am working on is coffee beans and funnel of the grinder.

Attachment of the material

To have the ‘’true sound’’ from the material, you need to make sure the material can vibrate freely. So less tightness of the connection and less contacting surface.

Otherwise, the material will vibrate with the structure and loose the ‘’sound identity’’ of it.

What so I mean by ‘‘true sound’’ and ‘‘sound identity’’ is. For example, a small piece of metal are supposed to sounds clinging in a hight pitch, but when you attach it tightly with plastic structure, the sound result will be more like plastic sound than metal sound.

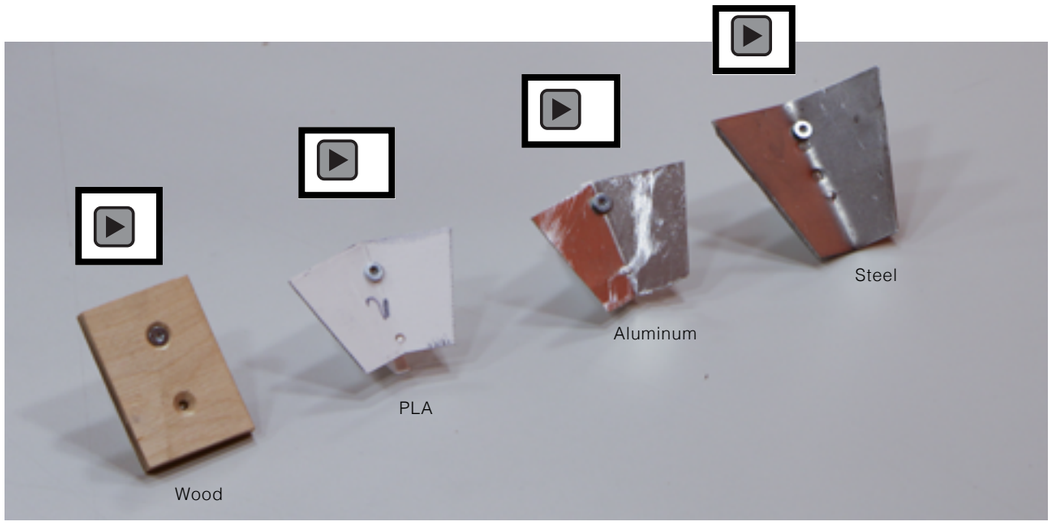
Same material with different attachments

Click the sound Icon to hear the difference!Be careful with the volume
Please use the Adobe Acrobat for the sound

Different materials

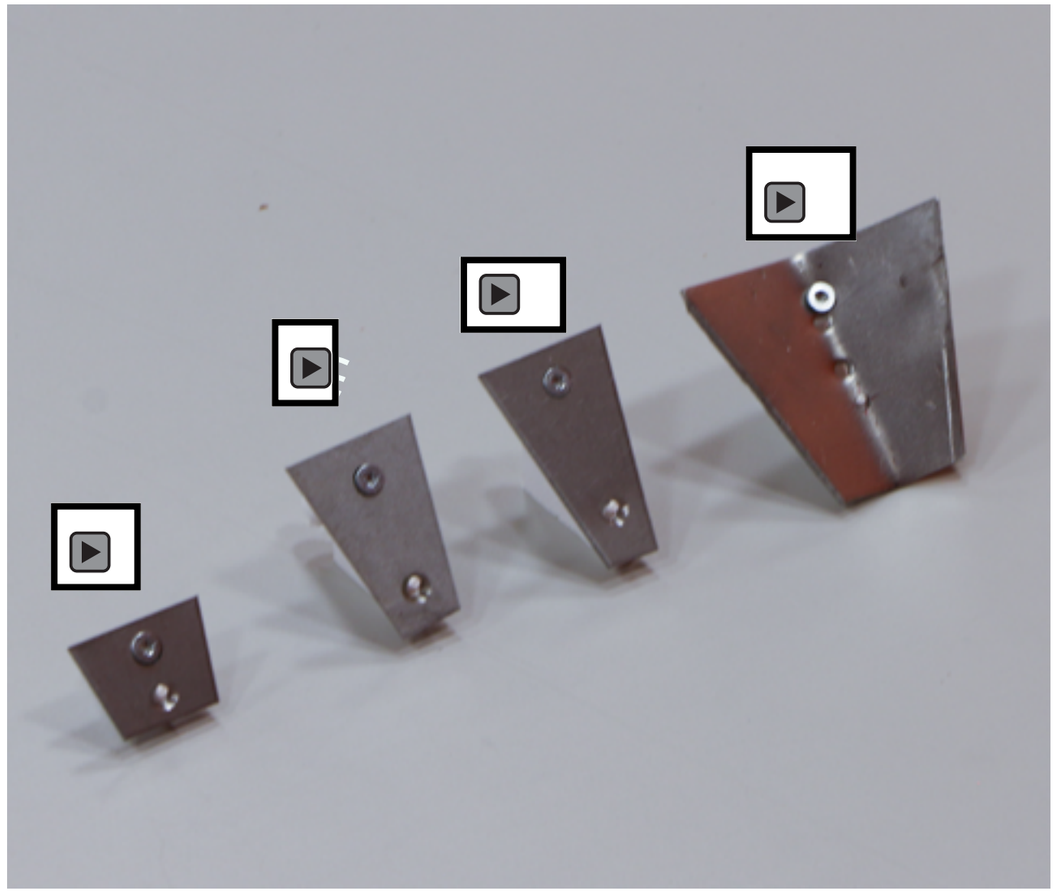
I tried 4 types of materials in this project. Metal, wood, plastic and soft material.

When collide with coffee beans, the metal produce sounds with the most sharpness, the plastic (PLA) is the second and wood produce quiet soft sound.



Frequency(pitch)

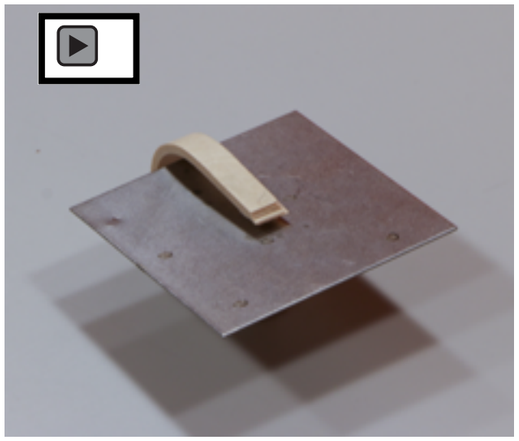
Lots of things can cause the frequency of the sound change. But I found out the small the size of the material is, the higher pitch sound it will produce

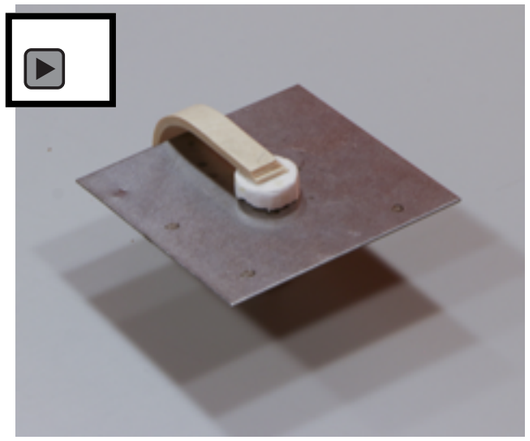


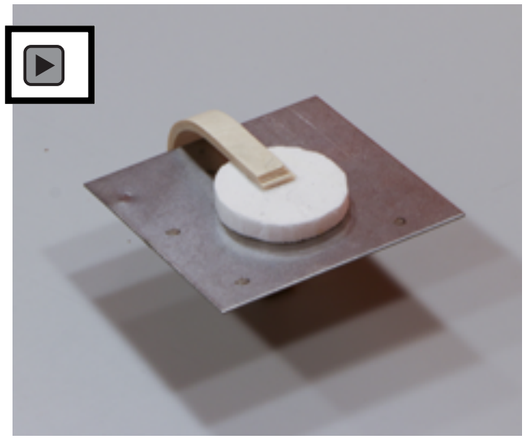
Sustain

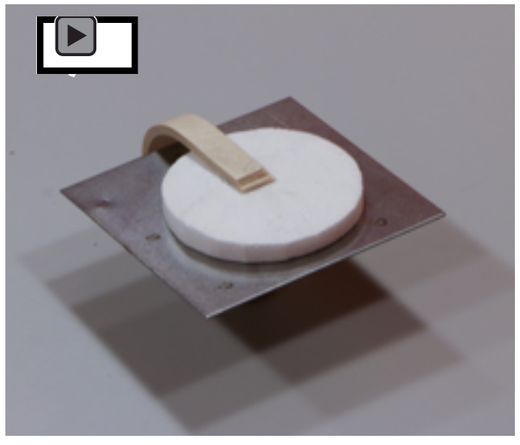
To make more sustain in the sound, you need to make sure the material vibrate freely. This means: less tightness of attachment of the material, less contact area with the structure.

Otherwise, you reduce the sustain of the sound result.



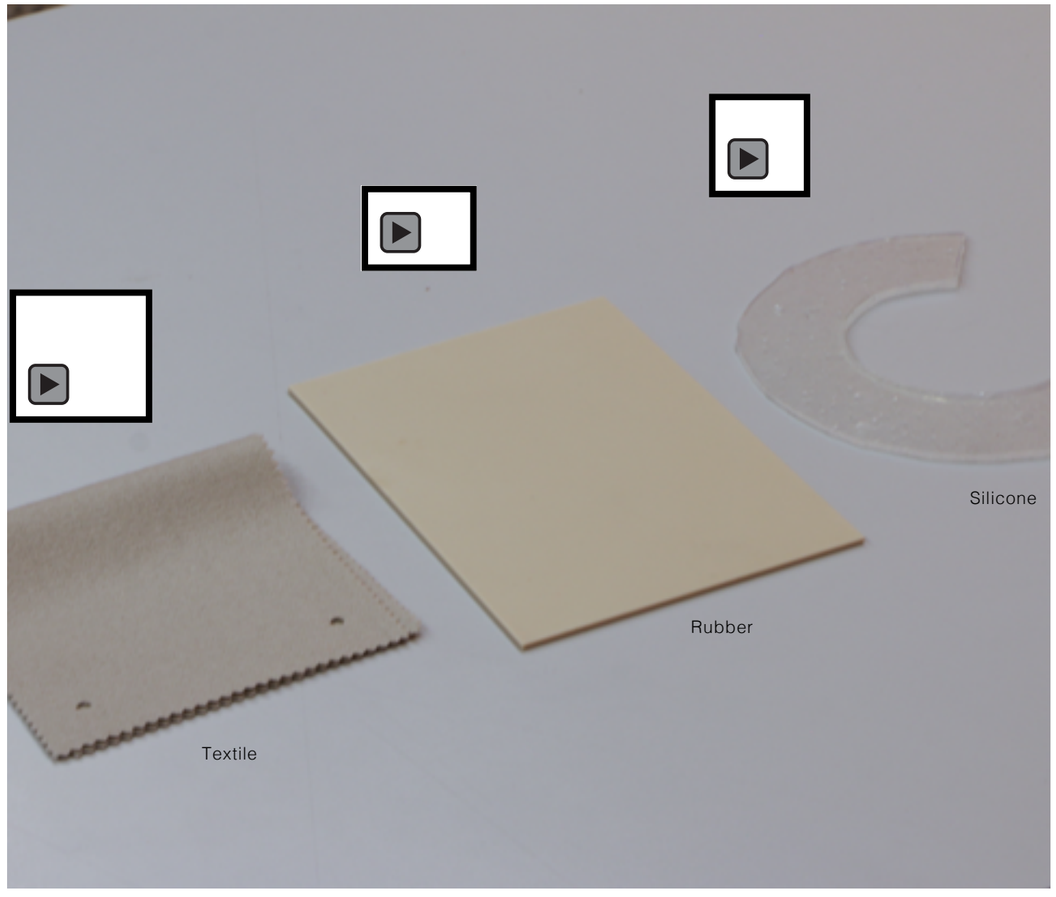






Reduce sound

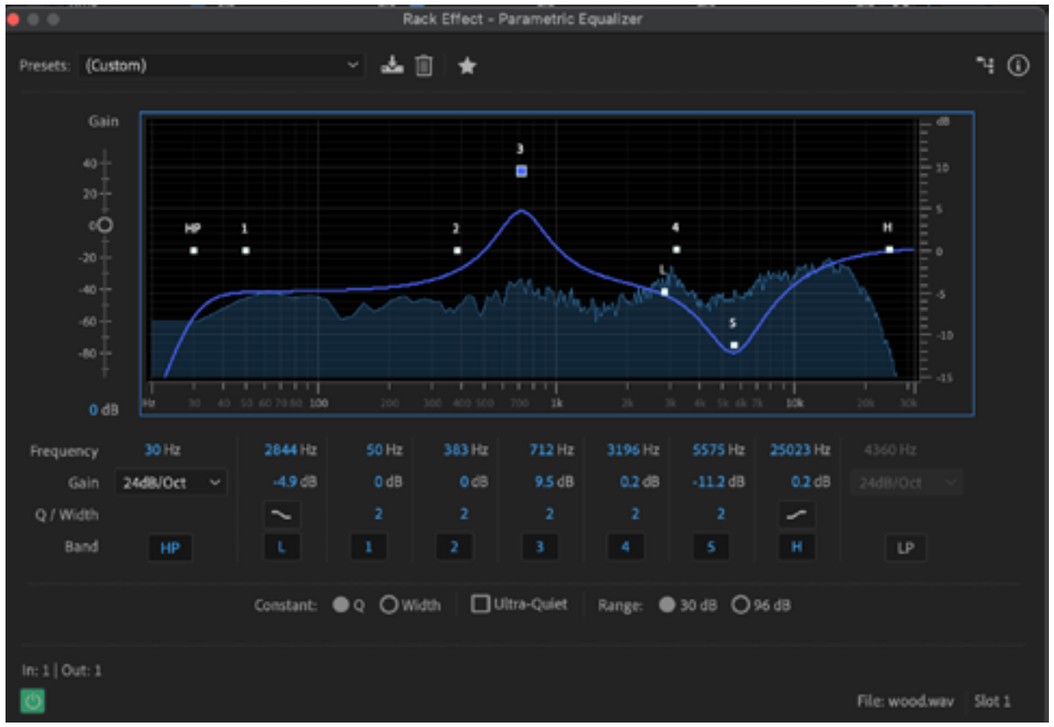
The soft materials damped the sounds. They are great tools to reduce distracting or unwanted sounds.



Presenting the sound

To present your sound, you can do it physically or digitally. Physically presenting allows people to hear exactly what do you want.

But if digitally presenting is needed. One needs to make sure the sounds is the same as you hear on the physical prototype. There are three things to consider 1. Make sure using devices that pick up wide range of sound frequencies. 2. A quiet room. 3. Using digital tool like Adobe Audition to tweak the sounds to what the same as what you hear physically with the model. Because sometimes the sound is different in recording than your prototype, due to the way you record and the limitation of the device. The digital tools allows you to tweak with the frequencies, loudness and other qualities of the sound.



Using digital tools to make
the recordings sound exact
the same as real sound

THANKS FOR READING!