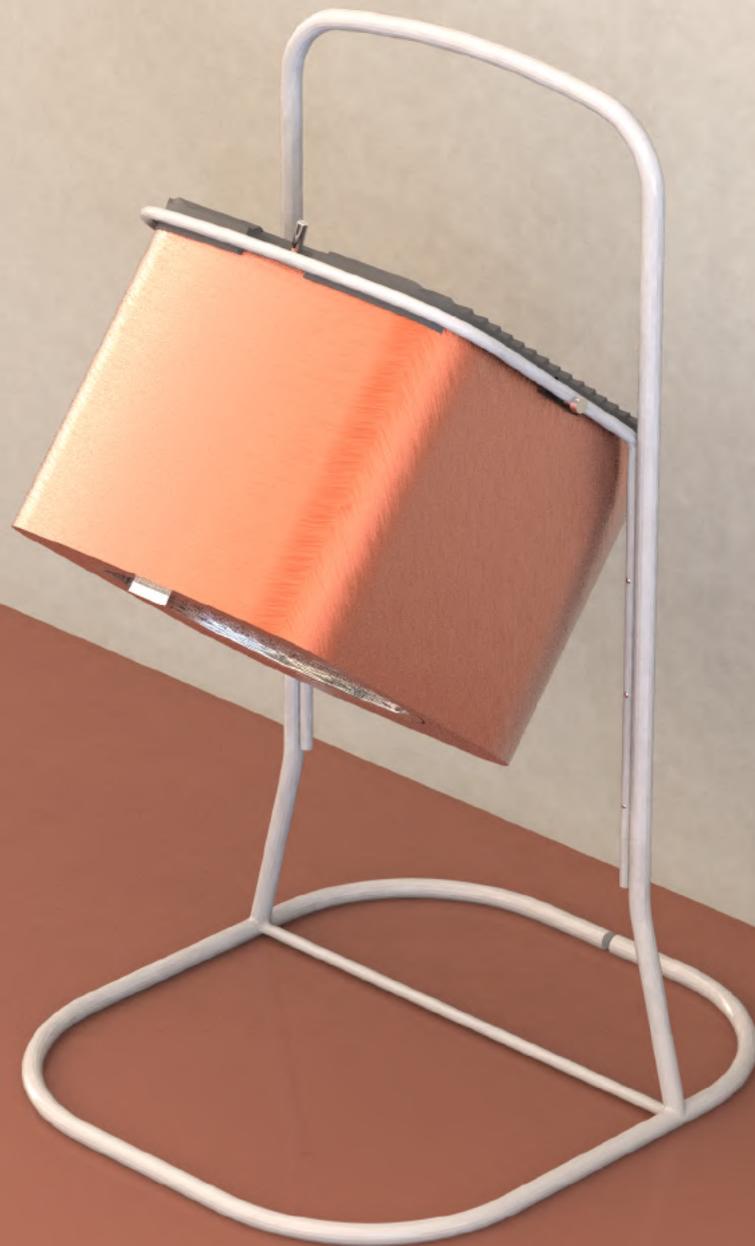


HOD

Portable Kitchen Hood
For Small Rental Apartment



LUND
UNIVERSITY

Sunjie Gu 2021

HOD

by

Sunjie Gu

**Degree Project for
Master of Fine Arts in Design**

Main Field of Study Industrial Design from
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2021

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Abstract

The shrinking of kitchen spaces has blurred the boundary of cooking, especially for young renters in small spaces. After talking to friends who have lived with tiny kitchens, I realized that they sometimes prefer cooking with friends outside their kitchenette, or have to buy their own kitchen products to add to the poorly equipped kitchen.

I want to facilitate this cooking pattern by designing a portable kitchen product. Hob is a portable kitchen hood with an activated charcoal built in. It could be inserted beneath the portable induction cooker to capture the smoke and grease on a larger range. The three gears suit different heights of kitchenware.

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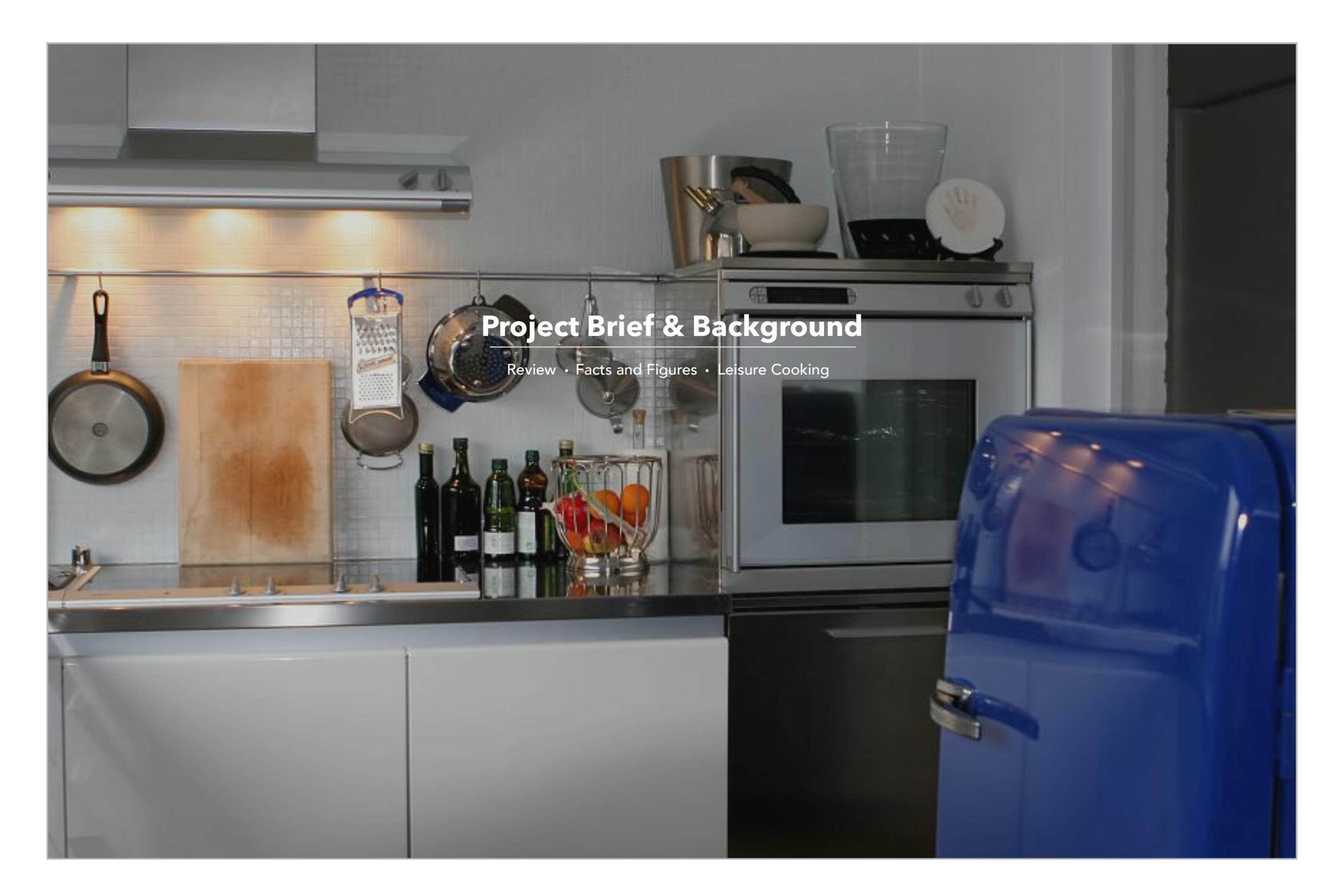
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Project Brief & Background

Review · Facts and Figures · Leisure Cooking

Project Brief & Background

Review



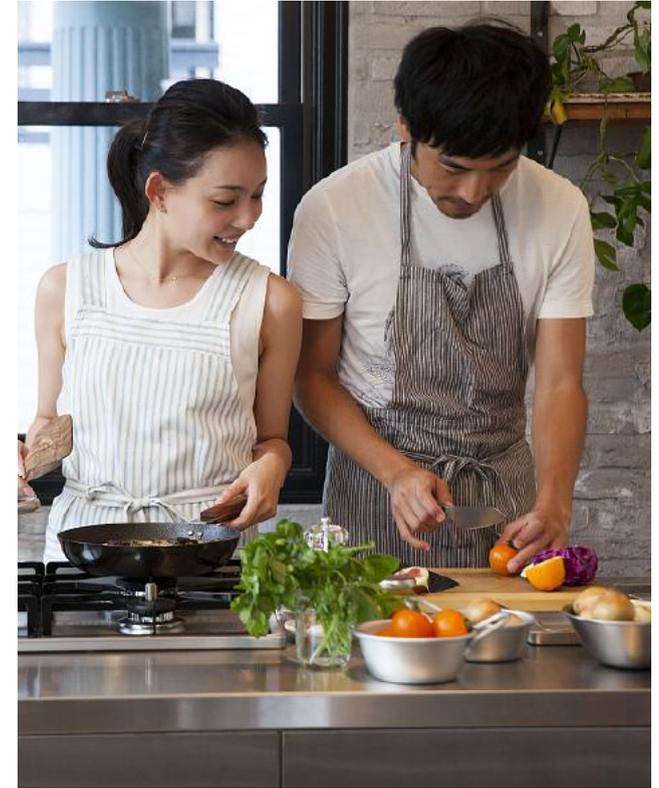
Decrease of Kitchen Space

According to the report, space dedicated to food preparation peaked in the 1960s and is now 13% smaller in new-build homes.



Fluid Living

"All over the world we see increasingly fluid living." Fluid living is a concept developed by IKEA. It gives a name to a change of behaviour we are seeing in the home.



Leisure Cooking

When cooking is no longer labour-intensive or strictly necessary in the modern industrial societies, it can become a pleasant pursuit one chooses to do in free time.

Project Brief & Background

Facts and Figures

1.that new rental developments in New York marketed to young people rarely even have kitchen islands now, and there's often minimal counter space.(2018)

2.earlier in 2018, living rooms and kitchens in British homes have shrunk to levels last seen 80 years ago

3.According to the report, space dedicated to food preparation peaked in the 1960s and is now 13% smaller in new-build homes.

4.A rare 2008 study on the topic by British market research firm the Future Foundation found that 52% of men versus 40% of women in the United Kingdom thought of cooking as a hobby and not a chore .



Now

1960s

Project Brief & Background

State of Fluid Living

Instead of eating in the kitchen, sleeping in the bedroom and washing in the bathroom; we now eat in the living room, watch TV on a laptop in the bath and work whilst lying on the sofa.



Project Brief & Background

Needs in Leisure Cooking

In qualitative research on cooking, people give a variety of reasons for enjoying cooking. Many mention the sensual pleasures of tasting, smelling, and manipulating food or the creative gratification of coming up with new dishes. Others find cooking therapeutic or relaxing. As it requires some concentration, cooking can take one's mind off of life's challenges. Cooking can also be fulfilling, especially when it is time- and labour-intensive, because it requires physical and mental skill and effort. It gives people a sense of challenge—planning and executing a meal—followed by one of accomplishment—feeding oneself and loved ones. For this reason, hobby cooking can be categorized with other skilled hobbies such as archery or woodworking and distinguished from more passive or unskilled hobbies such as watching TV or window shopping. Cooking is also an activity that can garner recognition, especially for leisure cooks, who tend to make relatively extravagant meals for guests rather than day-to-day meals for the household. Moreover, cooking can satisfy a desire to connect with nature and one's subsistence. This is especially relevant in late modern capitalism, when people rarely make what they consume (e.g., food, clothing, housing) with their own hands.





Design Opportunities

Literature Review • User Interview • Goals and Wishes

Design Opportunities

Extreme Cases

Through researching on the Internet, I try to understand the condition for the extreme micro living apartment, especially how people cook in the this condition. From the gathered picture, we could see there are quiet **restrained in movement of body**, and there might be **not enough space to stow things on the table surface**. Since there are many things in the same room, many has to be **moved frequently** to save the space on the table for other activities.



<https://www.businessinsider.com/craziest-microapartments-around-world-2016-9?r=US&IR=T#the-burger-family-from-los-angeles-california-gets-ready-in-a-converted-garage-in-wife-elizabeth-burgers-mothers-home-the-family-lost-their-home-in-2009-and-was-forced-to-sell-their-possessions-5>

Design Opportunities

User Interview

27, in rental apartment

Rent an accomadation with a kitchen of 1 m2, with stoves, refregerator, oven,sink etc.

She

She would avoid using the kitchen for frying since it's not equipped with a kitchen hood. And it's too small for she to cook especially when her friend come over for cooking. They would then put a table in the other room and cook with portable induction cooking top.

Her friend in the same condition

She also mentioned her friend in the same condition would just use the portable induction cooking top to cook outside the kitchen. As she puts it, "why not cook and eat in the same place? "

Design Opportunities

User Interview

24, in HongKong, rental apartment

He lives alone in the apartment, and almost cooks every meal in the kitchenette. To facilitate cooking, he bought some necessary products for cooking, includes induction cooker, pot, peeler and table ware. For the hygiene concern, he put some utensil on the wall.

He prefers to gathering with friends in restaurants instead of inviting them to cook.



Design Opportunities

The poorly-equipped kitchen/no kitchen condition

Although some apartment is equipped with kitchen or shared one, the young tenants might still feel restrained by the space to enjoy cooking. That's when cooking in the living room become an option. This might be especially common when cooking with friends or the loved ones.

In the meantime, some kitchenette lacks the necessary utensils for people to cook as they will. The young tenants need to put up the proper kitchen with the products they buy.



Design Opportunities

Goals and Wishes

How might we enable these people to cook in living room or poorly-equipped kitchenette?

Considered Problems

Lack of necessary products
Inflexible kitchen products
Concerns of cooking outside kitchen

Goals

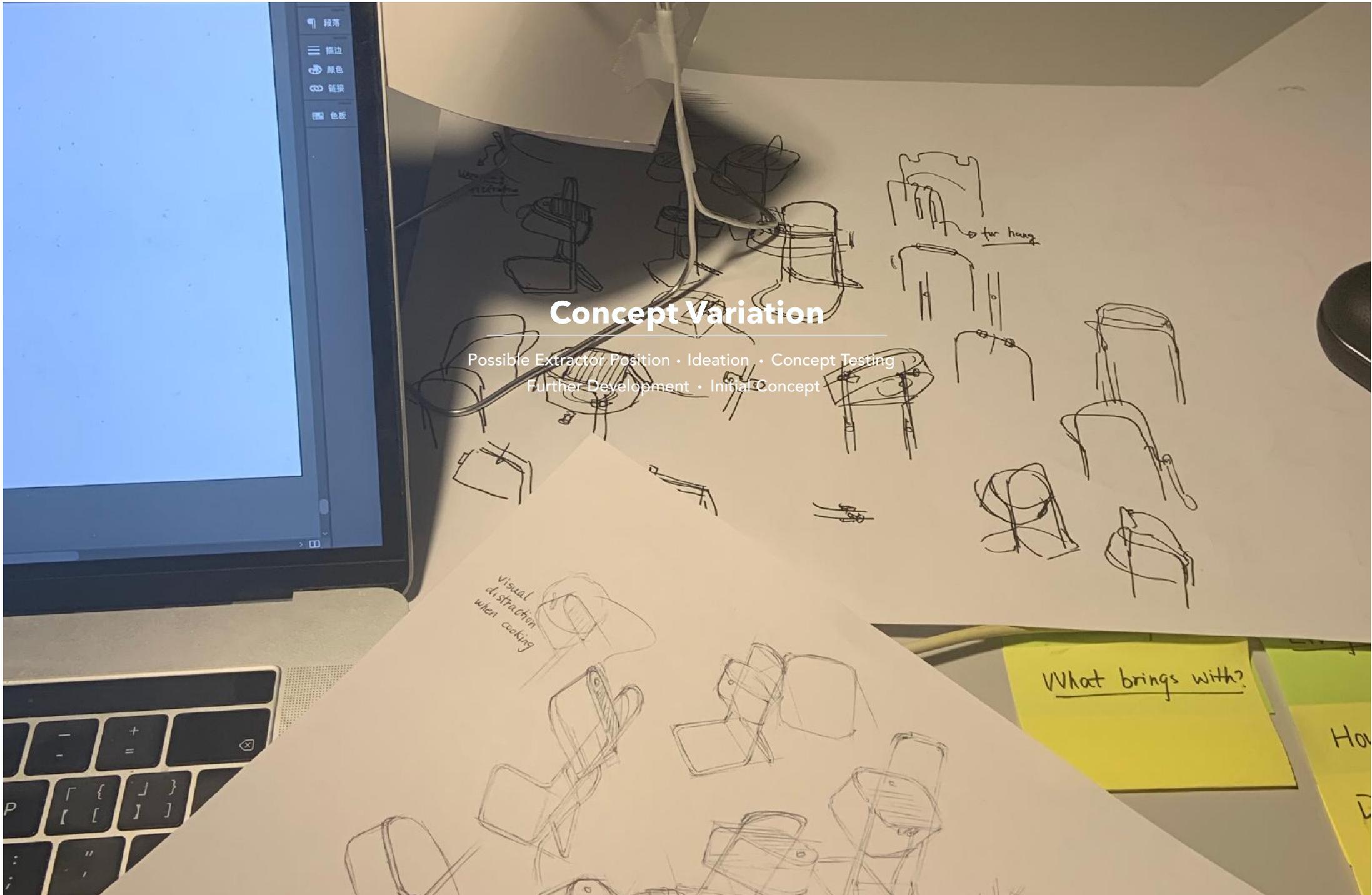
Portable/non-mounted kitchen ware
Get rid of the grease and smoke effectively
Decrease the overall costs

Expectation

Space-Saving
Easy for moving around
Space for stowing ingredients

Delimitation

Induction kitchen top will not be further studied considering the existing market
The development of the sink will not be further studied



Concept Variation

Possible Extractor Position · Ideation · Concept Testing
Further Development · Initial Concept

What brings with?

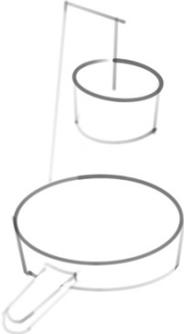
How

Concept Variation

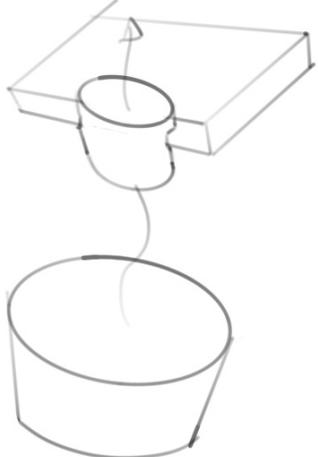
Initial Ideation on "the way of position"



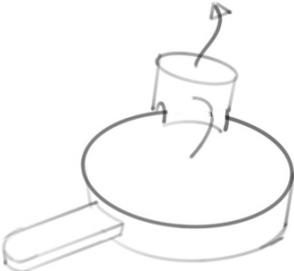
-stand by 1



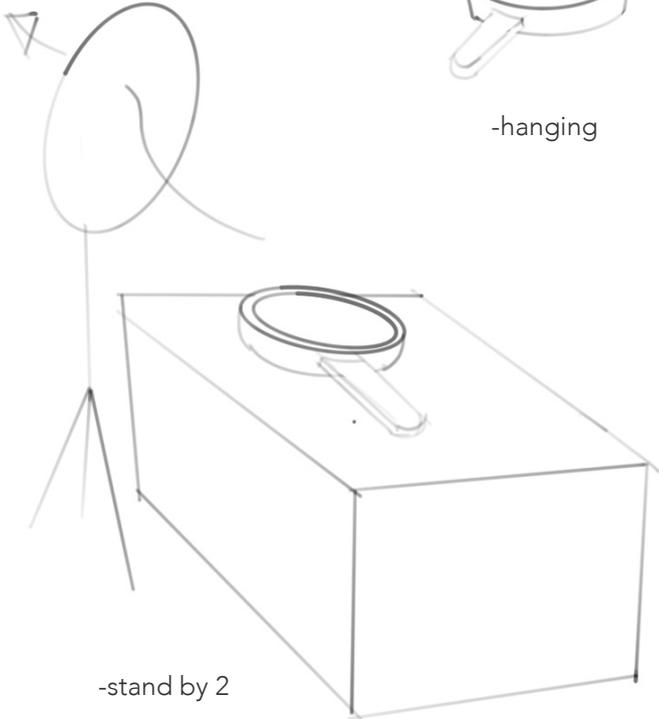
-hanging



-on shelf



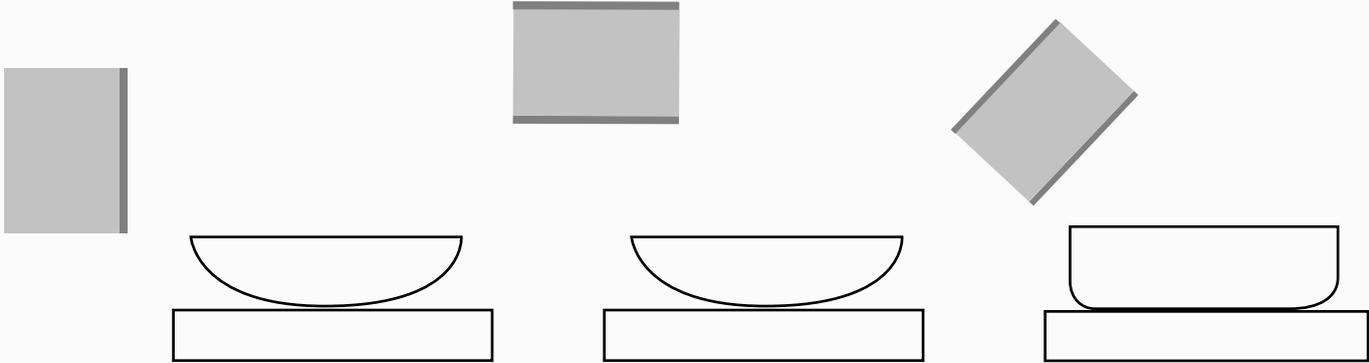
-attached



-stand by 2

Concept Variation

Possible Extractor Position



● filter ● extractor

Extractor Specification Φ 150mm/ height 100mm

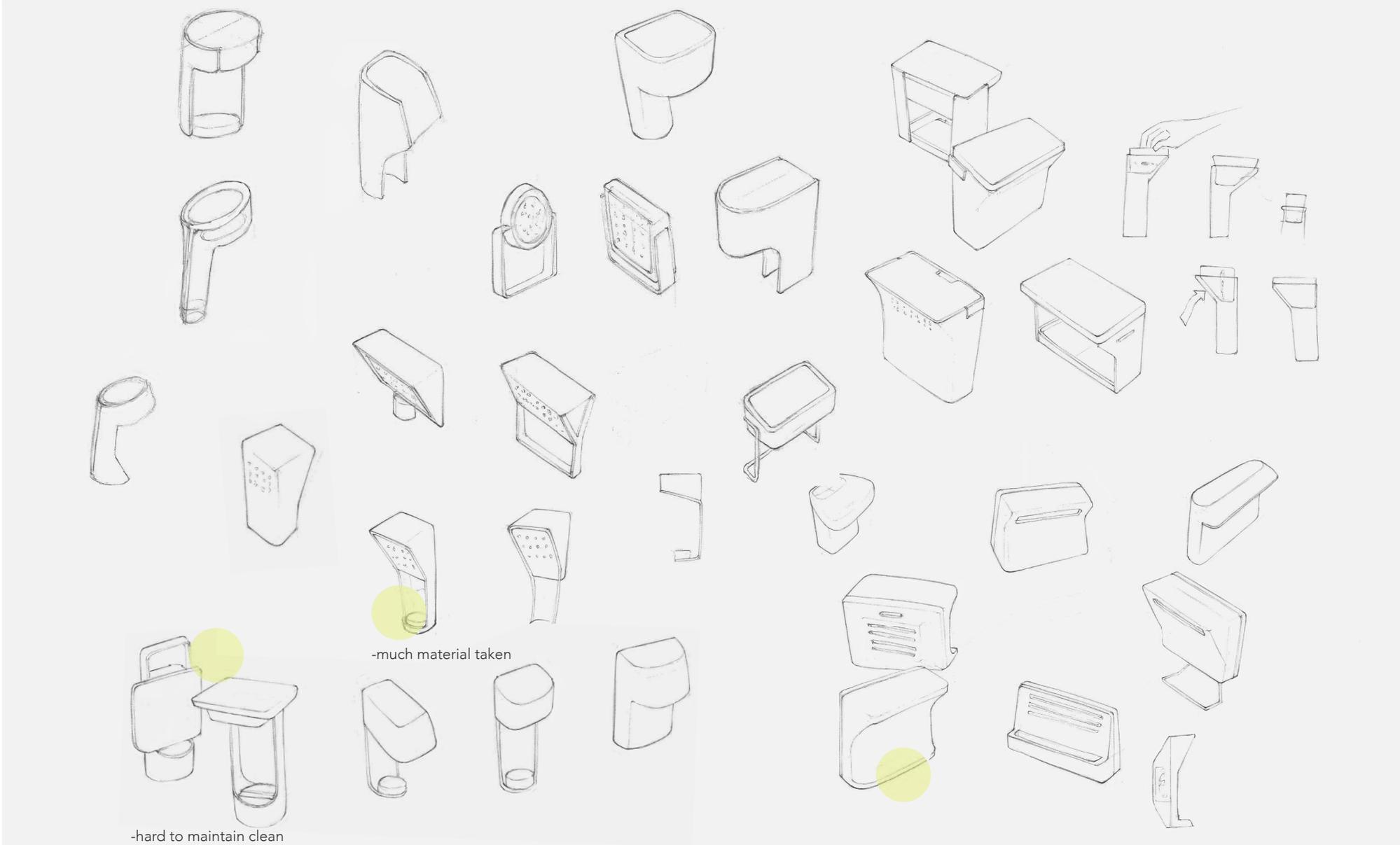
Concept Variation

Possible Extractor Position



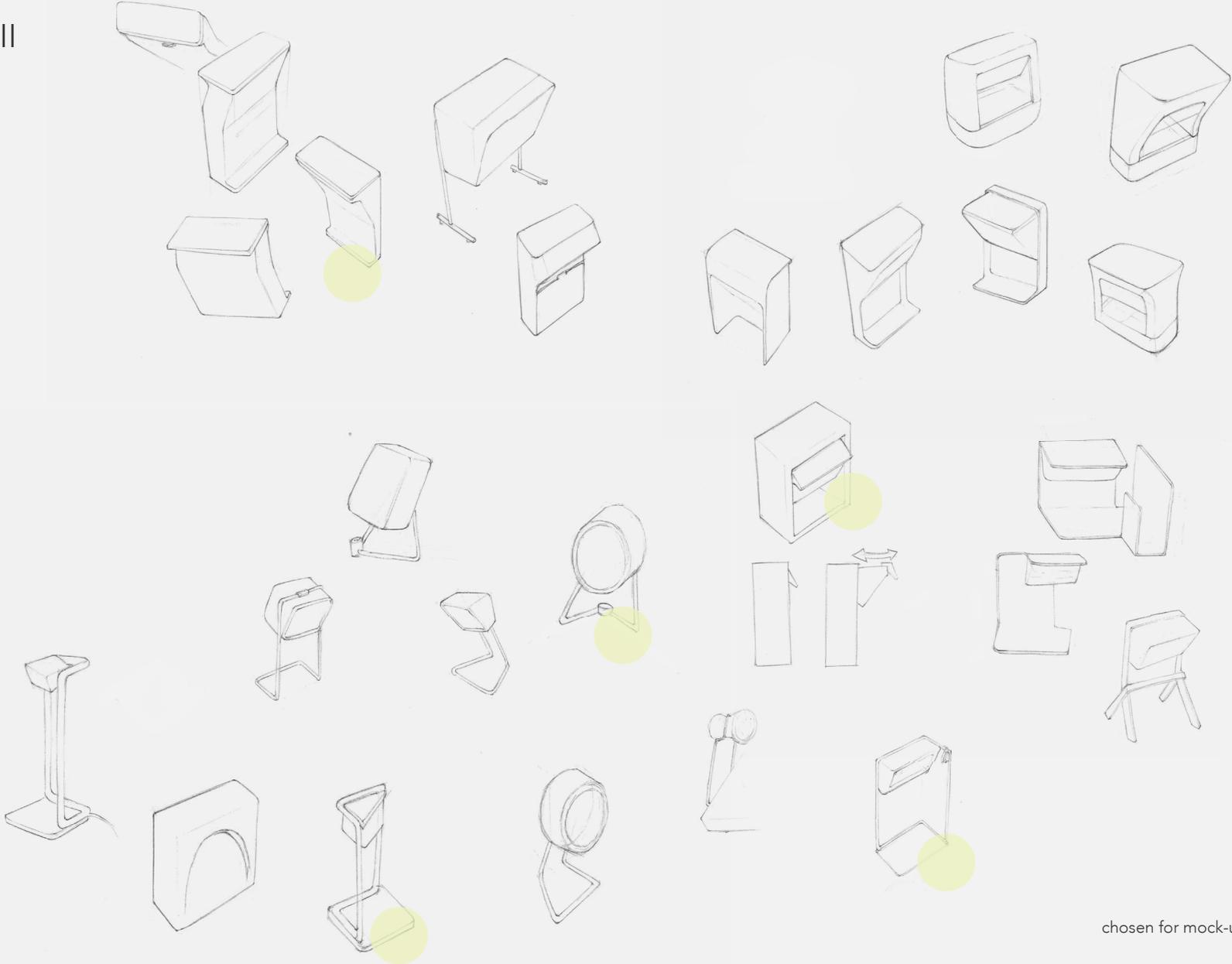
Concept Variation

Ideation I



Concept Variation

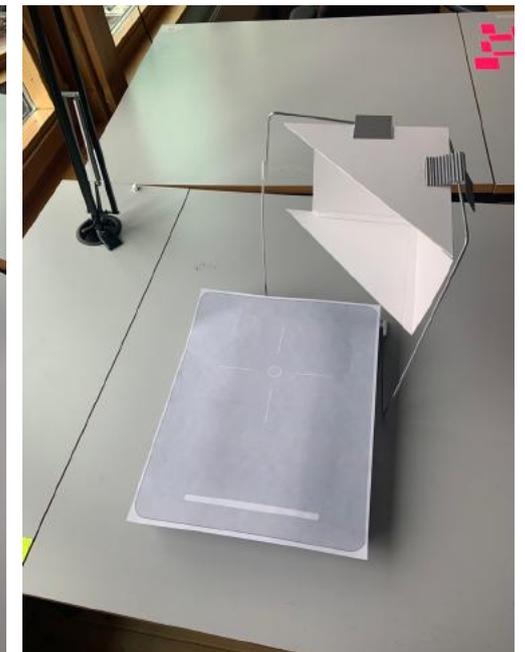
Ideation II



chosen for mock-up testing!

Concept Variation

Concept Testing



Concept 1- "Drawer"

- + Compact
- + Space-saving when not using
- + Space for ingredients
- Manufacturer costs

Concept 2- "Side Hanger"

- + Space-saving when using
- + Efficient
- + Low costs
- Space for viewing

Concept Variation

Concept Testing



Concept 3- "Hood"

- + Compact
- High manufacturing costs



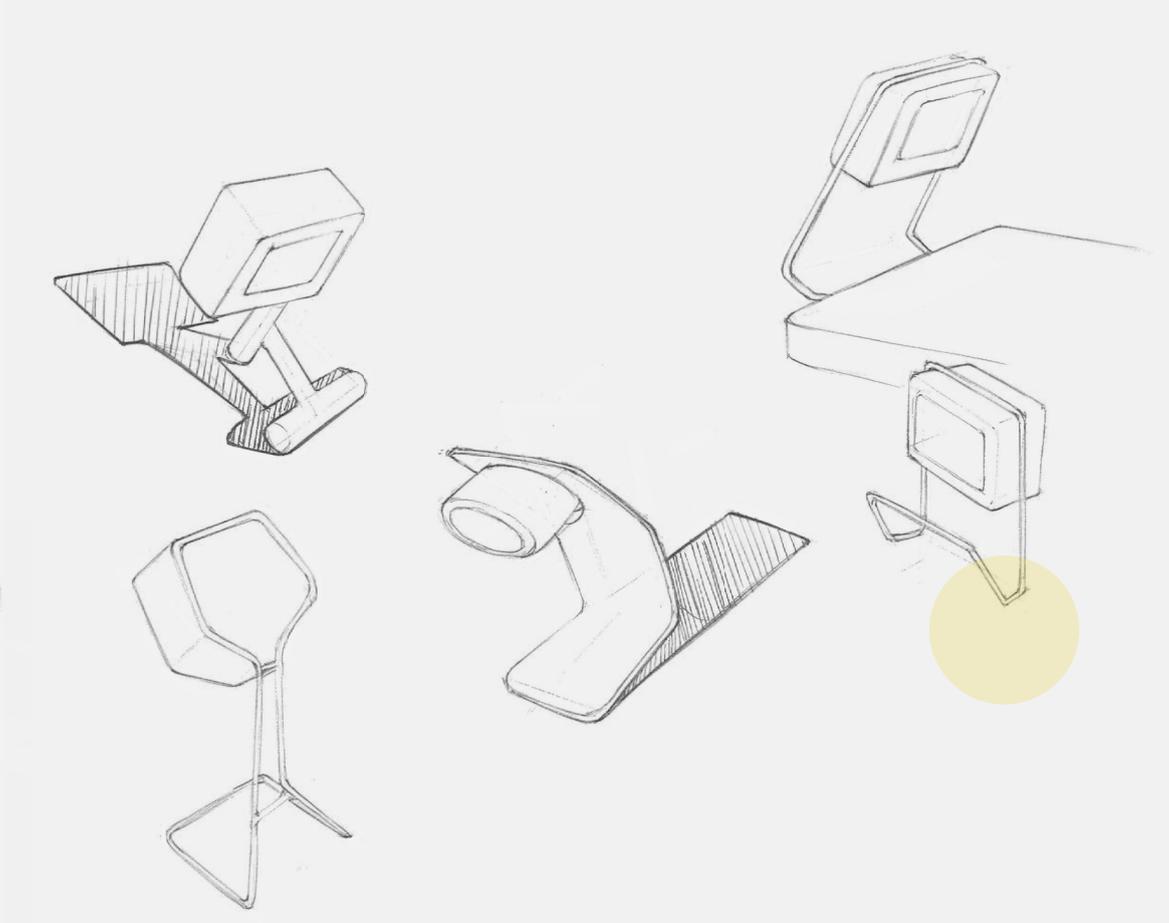
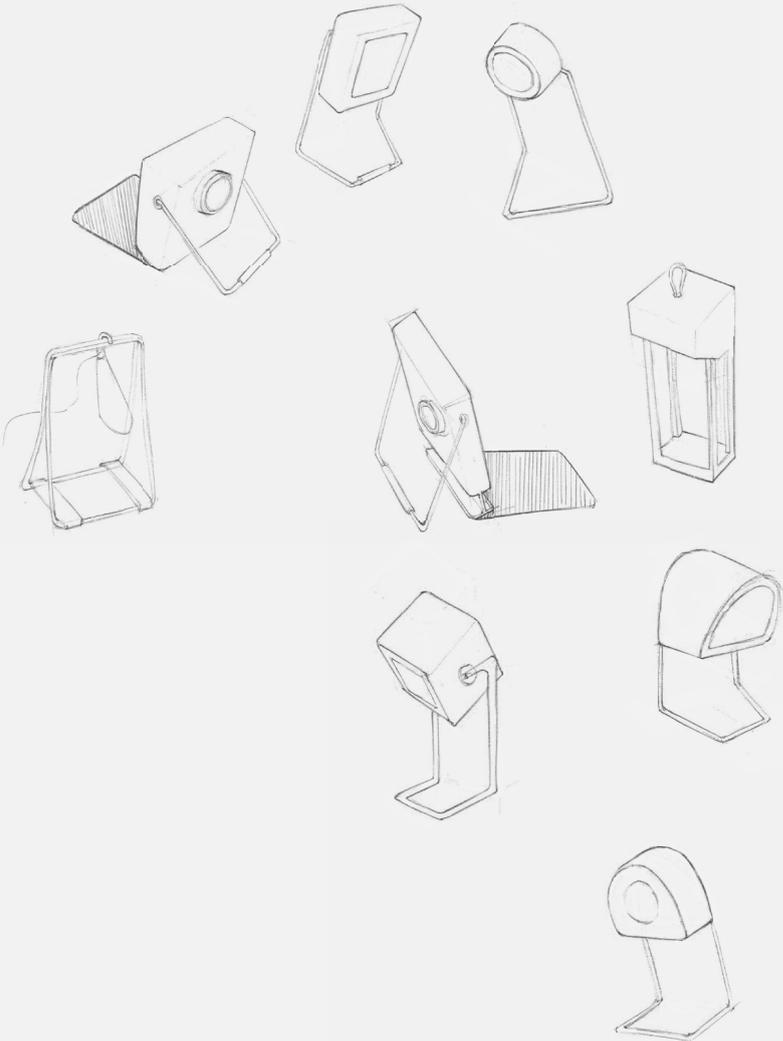
minimum material
and most effective

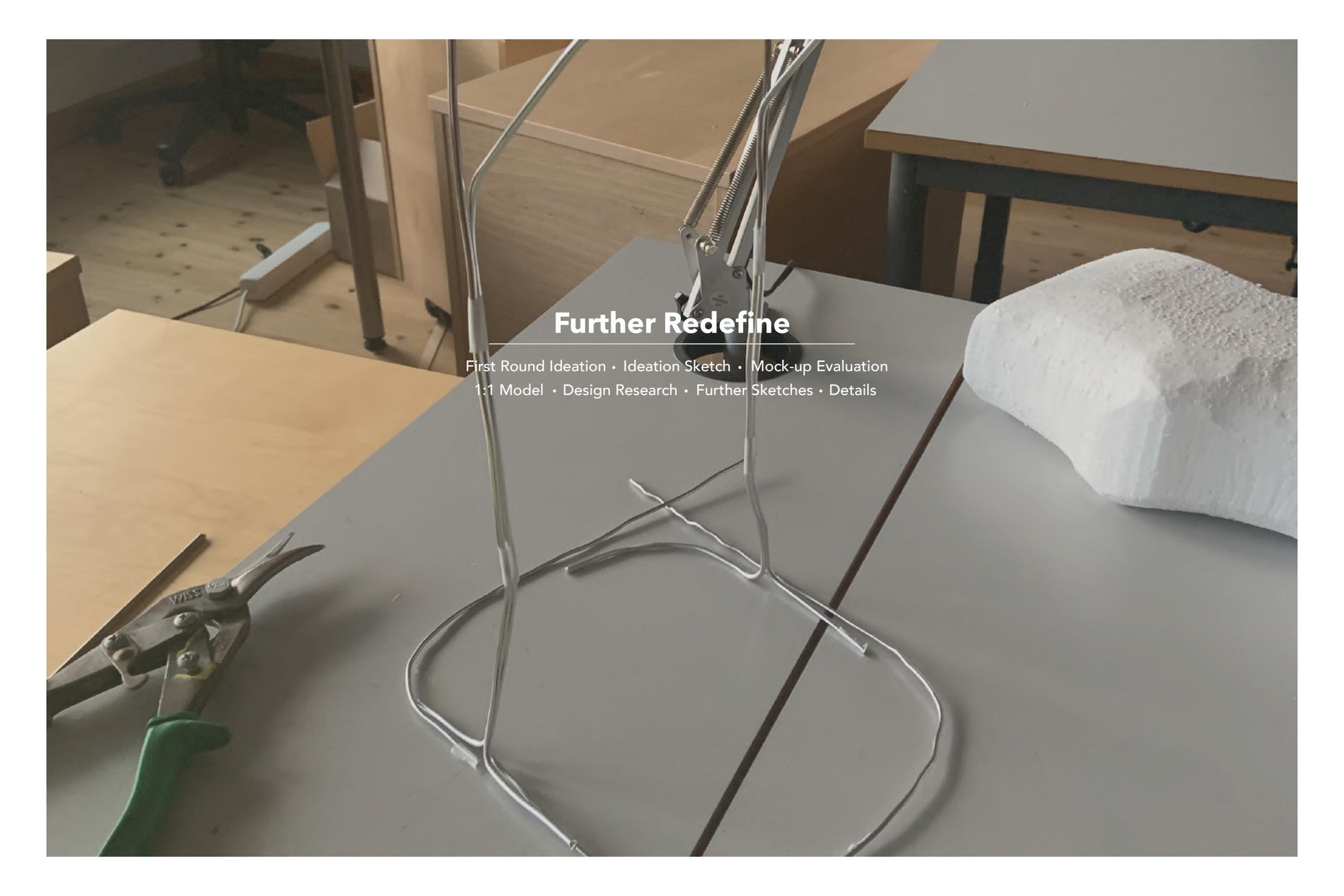
Concept 4- "Glide In"

- + Space-saving when using
- + Efficient
- + Low costs

Concept Variation

Further Development-minimum material



A photograph of a workshop. In the center, a wire sculpture is being worked on on a grey table. To the left, a pair of green-handled pliers is visible. To the right, there is a white foam model of a chair seat. The background shows wooden workbenches and a wooden floor.

Further Redefine

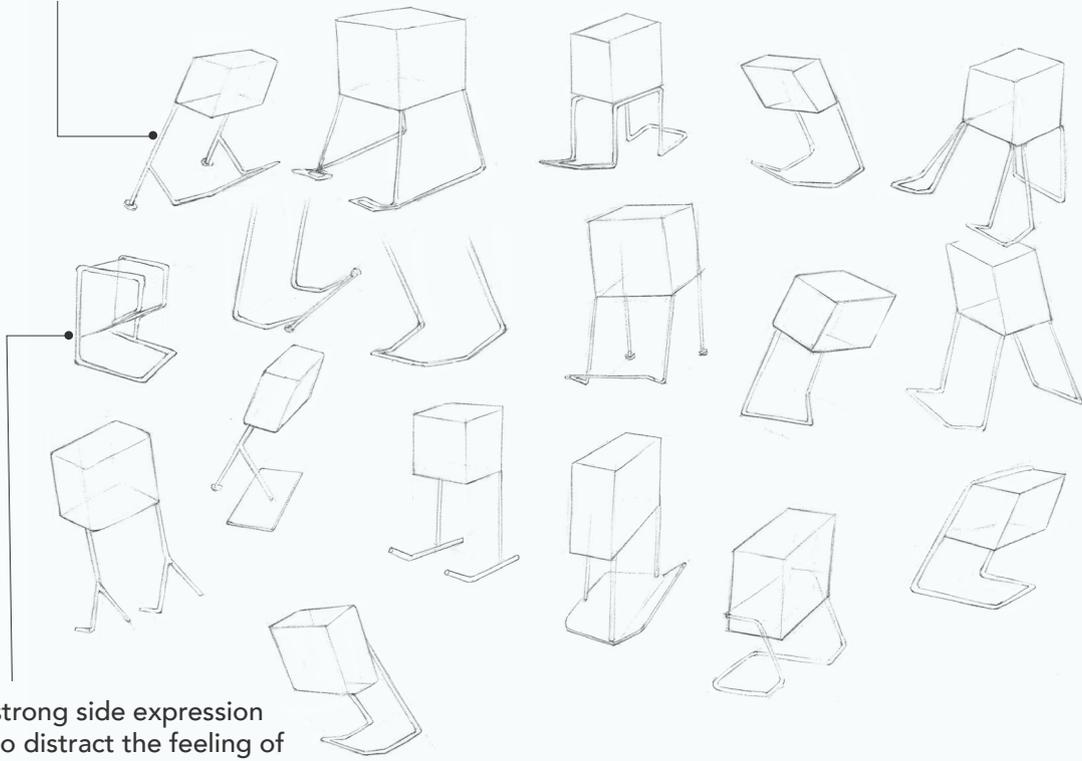
First Round Ideation · Ideation Sketch · Mock-up Evaluation
1:1 Model · Design Research · Further Sketches · Details

Further Redefine

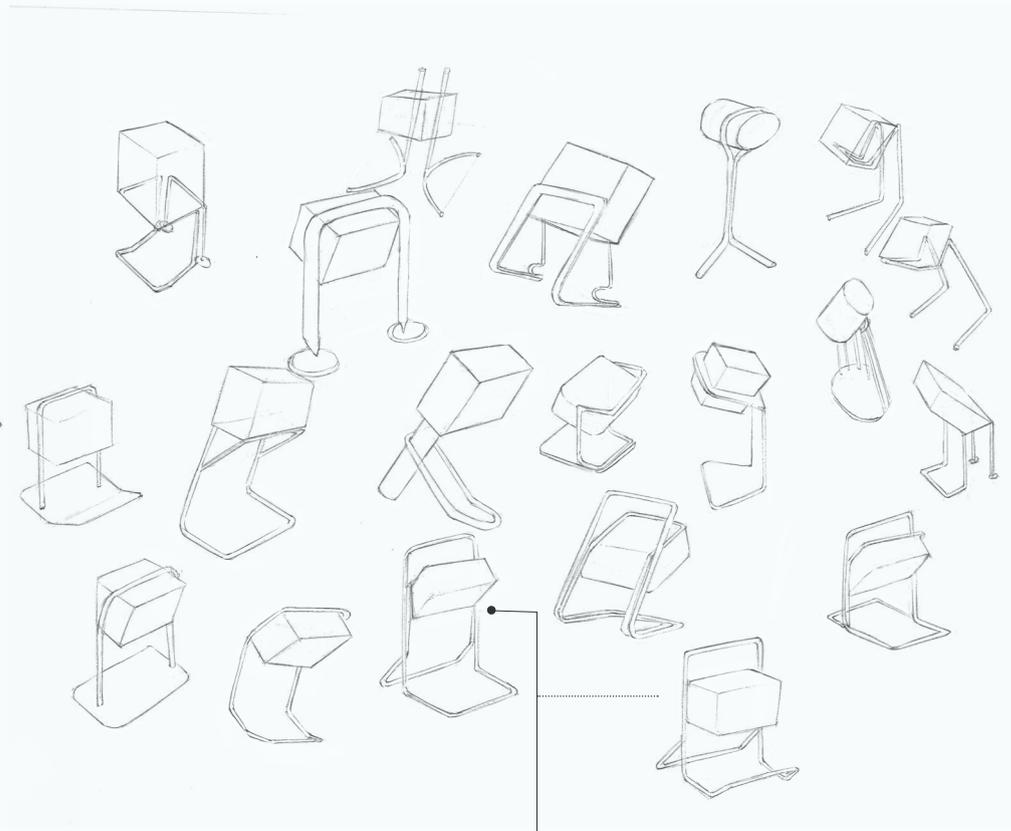
Ideation Sketch

Ideation sketch under the topic of stable expression, while the intake of the exhauster has to be inclined to achieve best efficiency. During the process of sketch exploration, approaches to gain balanced shape are gained.

tilting while in a balanced expression



strong side expression
to distract the feeling of
unbalanced

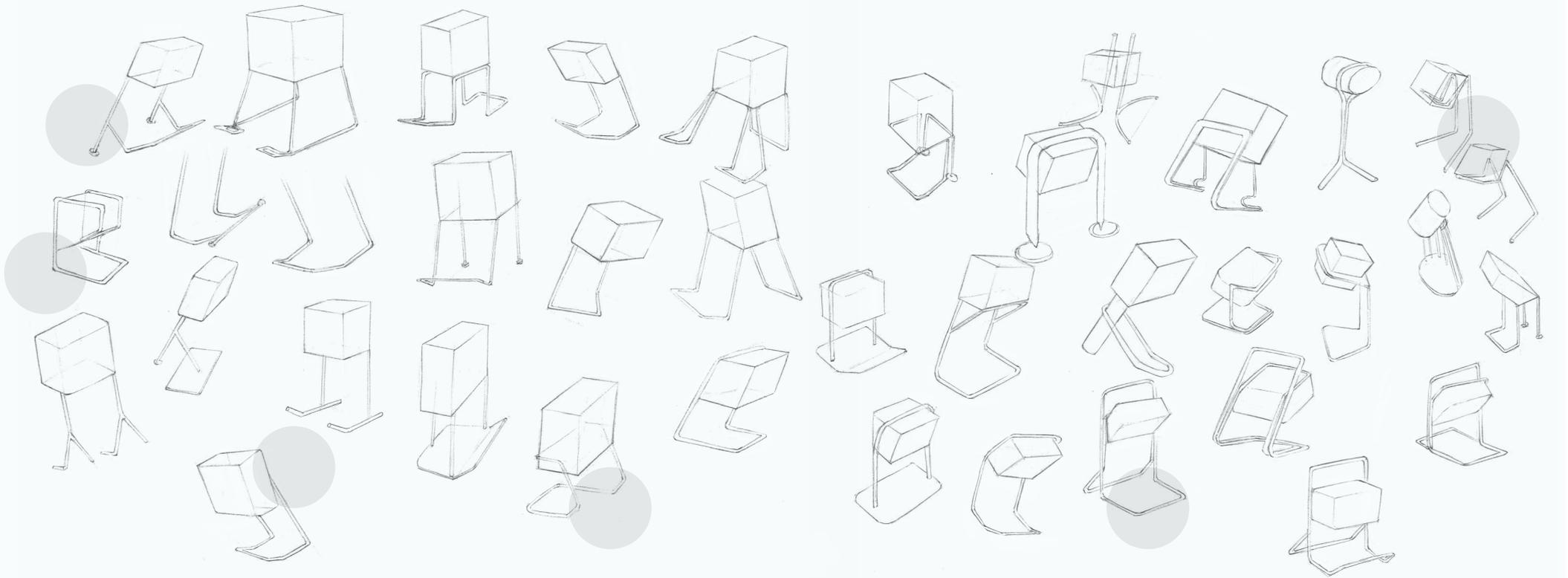


the inclined shape looks lighter

Further Redefine

Chosen Sketch

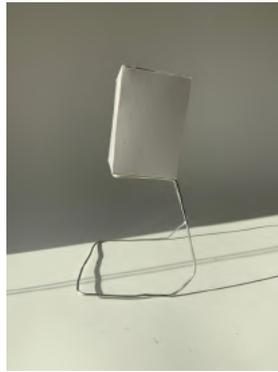
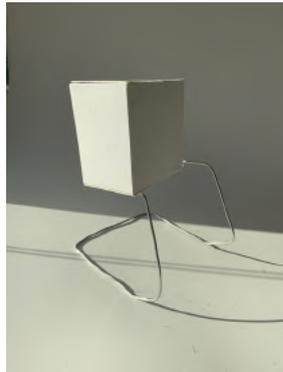
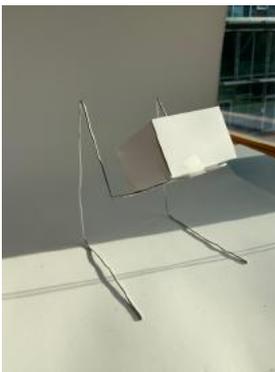
The selected sketches below are considered for later mock-up phase.



Further Redefine

Mock-up Evaluation

With the scale model, the stability in each chosen concept are further explored. The white box represent the motor-the main weight regarding the same proportion. Each concept are shown in 1-3 pictures.



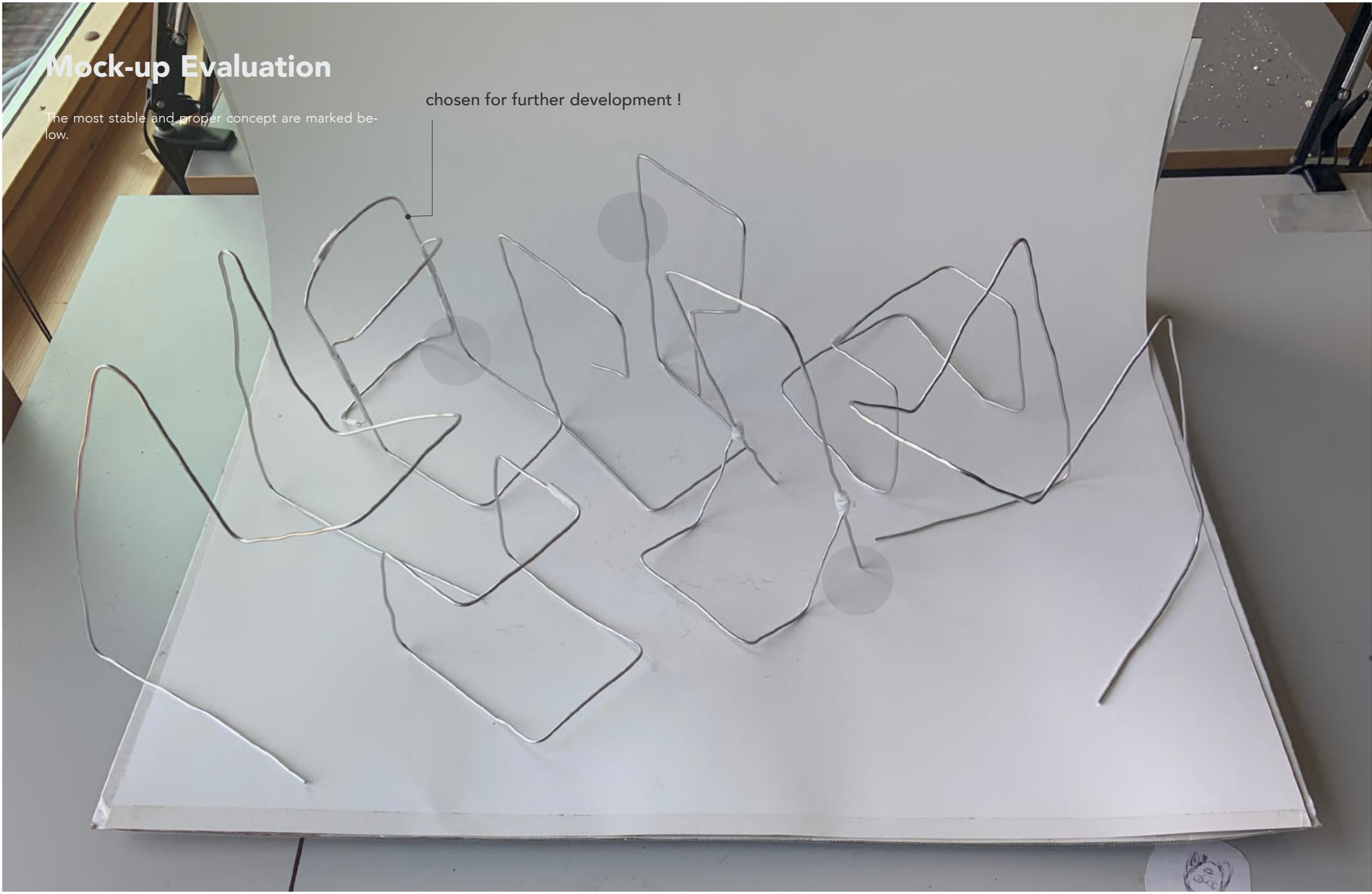
not visually stable

not visually stable

Mock-up Evaluation

The most stable and proper concept are marked below.

chosen for further development !



Further Redefine

1:1 Model Testing



Further Redefine

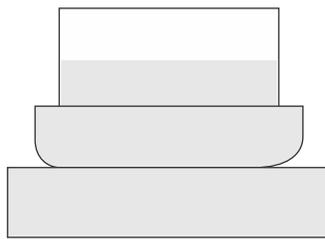
1:1 Model Testing



Further Redefine

Design Research Height

26.2-27.1 cm
16.2-17.1 cm
10.2-12.1 cm



6.2 cm-7.1 cm



4 cm-5 cm



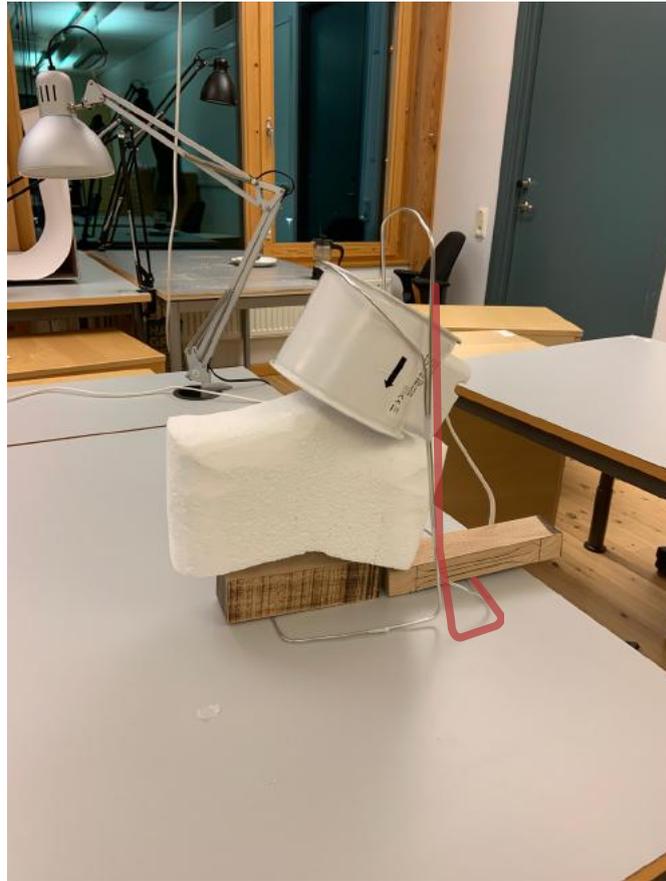
10 cm-20 cm

Different stages of height

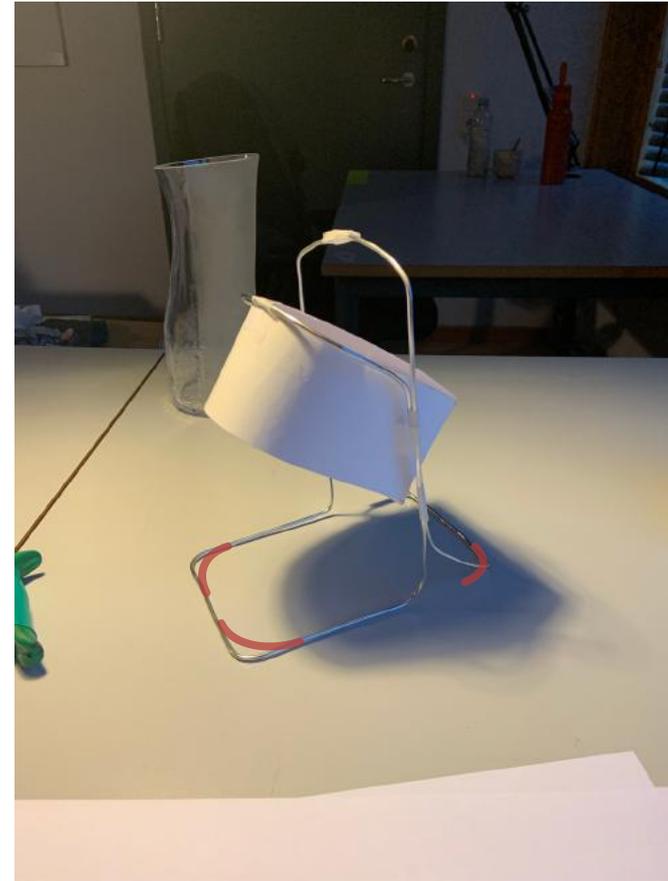


Further Redefine

Details Redefine



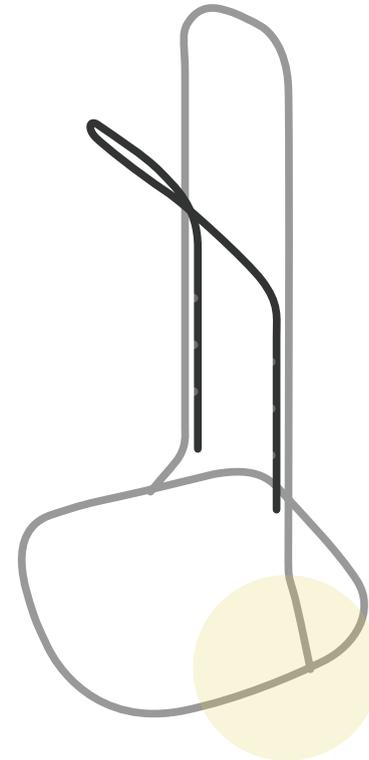
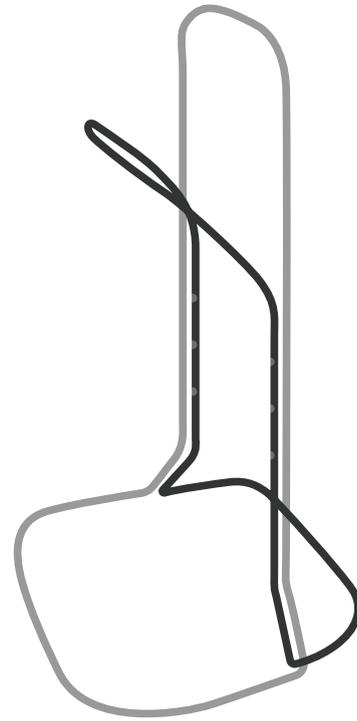
taper near the bottom
+ more stable



same round edge
+ production-wise

Further Redefine

Details Redefine



easier production!

Further Redefine

Form Development



Feasible!
considering
the motor
size

A workshop scene featuring a metal wire sculpture on a grey table. The sculpture consists of two vertical legs and a horizontal base, with a thin wire extending from the top of one leg. To the left, a pair of green-handled pliers is visible. To the right, there is a white, textured foam object. The background shows wooden workbenches and a power strip on the floor.

Final Products

Colours and Finishing · Usage Flow · Product Features

Colours and Finishing

CMF Definition

"social kitchen"

"feeding the loved one"

**content
connection**



**professional
cooker**

"new masculine"

"self identity"



"taking mind off work"

**relaxing
home**



"cook where you eat"

With the insights from the previous research, I tried to summarize different cooking preferences in texts, and concluded the 3 most representative and strong cooking concepts for the young renters. The 3 keywords also serve as the reference for the define of colours and finishing of the products.

Colours and Finishing

CMF Definition



(Galvanized) Steel

The material is chosen as the steel since it's much cheaper compared to stainless steel. And when comparing with aluminium, it's appears better when it comes to the acid resistance.



Chrome plated/Zinc plating

The chrome plated layer finishing are applied on the base, since it adds decorative value, provide corrosion resistance and ease cleaning procedures. The shell part applies the Zinc plating to provide a variety of colours.

Colours and Finishing

CMF Definition

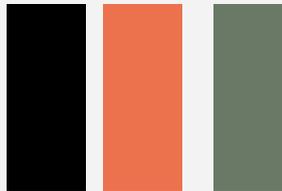
Grease Filter

To differentiate the grease filter, the chrome plated are applied to highlight different functions from the shell.



Shell

The shell is zinc plated in the colour to express respectively the slight hardcore feeling, the warmth and relaxing feeling. The colours are chosen to add character to the products and appeal to different group of users.



Base

The chrome plated/white coloured base is used to neutralize the main colour and blend into the environment.



Switch

To highlight the unobtrusive switch, copper switch button are applied to differentiate from the shell.

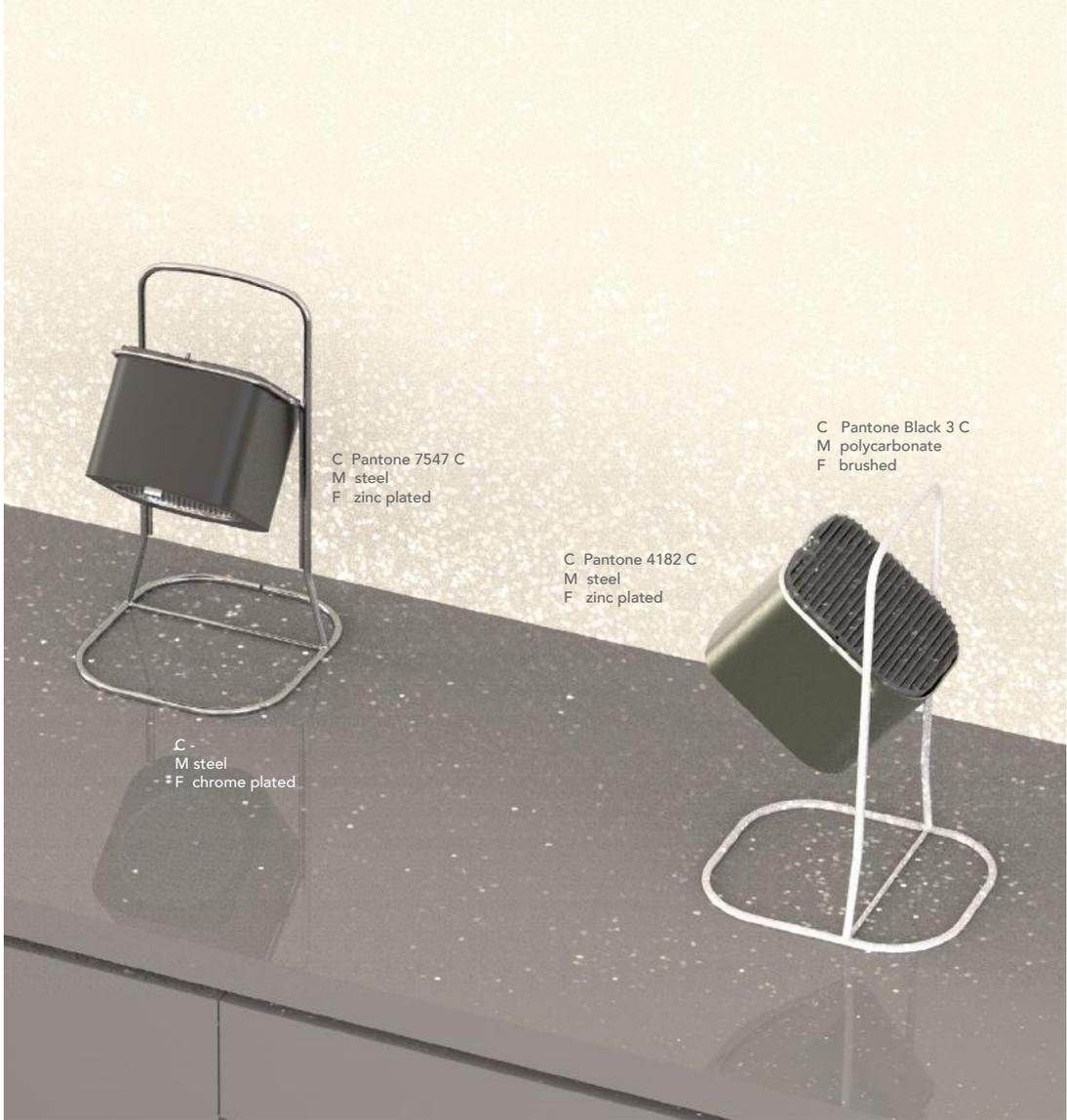


Diffuser

The dark colour is applied to take less attention while still show different function from other parts.



Colours and Finishing



Usage Flow



1.insert under portable induction cooker



2.lift to the desired height and push the button to start

For different type of kitchenware

Three stages of height adjustment allow the products to deal with cooking utensils from frying pan to cooking pot. The height includes 140mm, 185mm, 230mm.

The extraction capacity could be up to 280 m³/h, and the noise level is around 36 dbA.

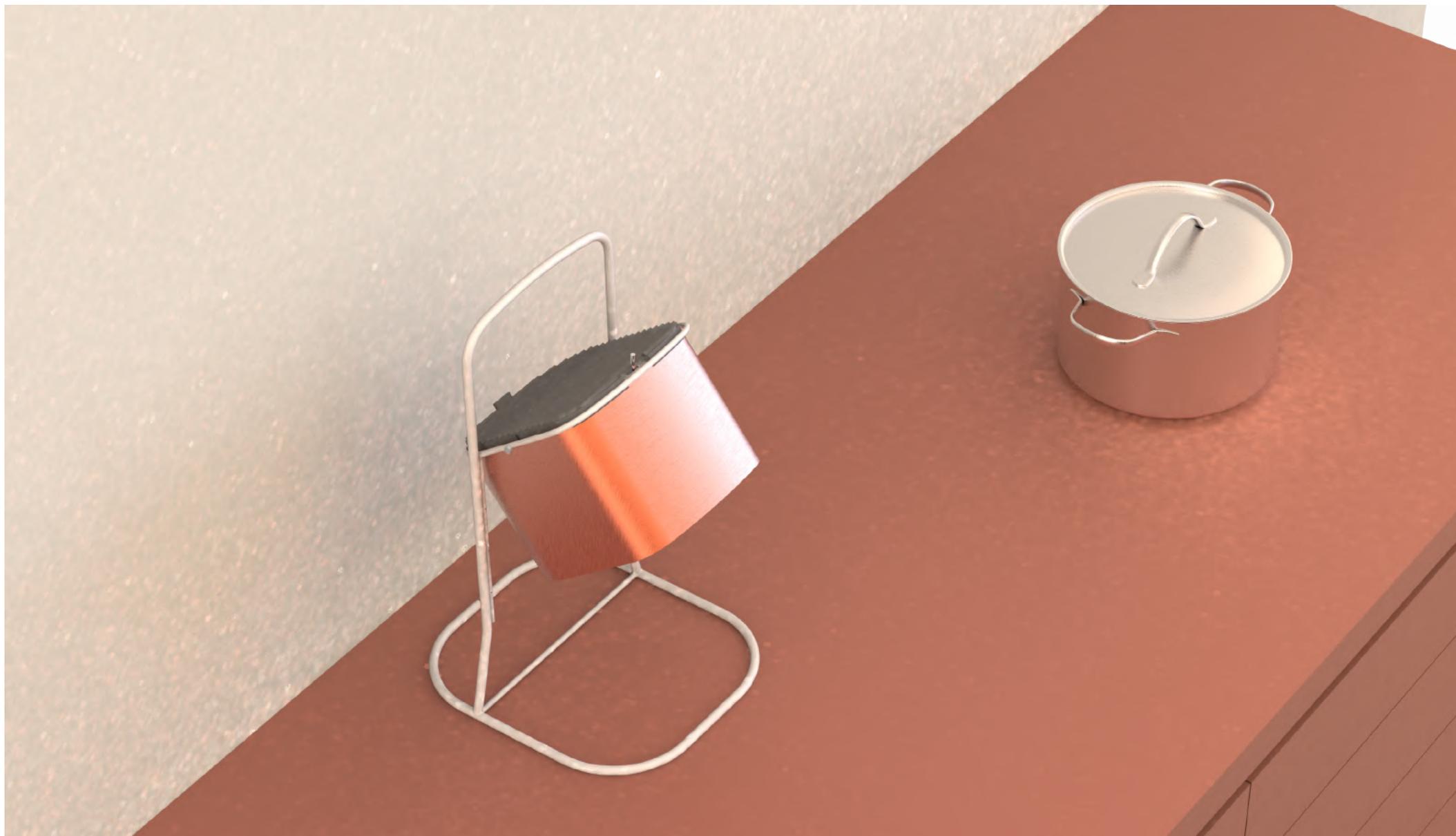


Flexible way of placing

Even in the small kitchenette or on the shelf, the products could be placed by the induction cooker to save the space.



Control button and Replaceable Filter

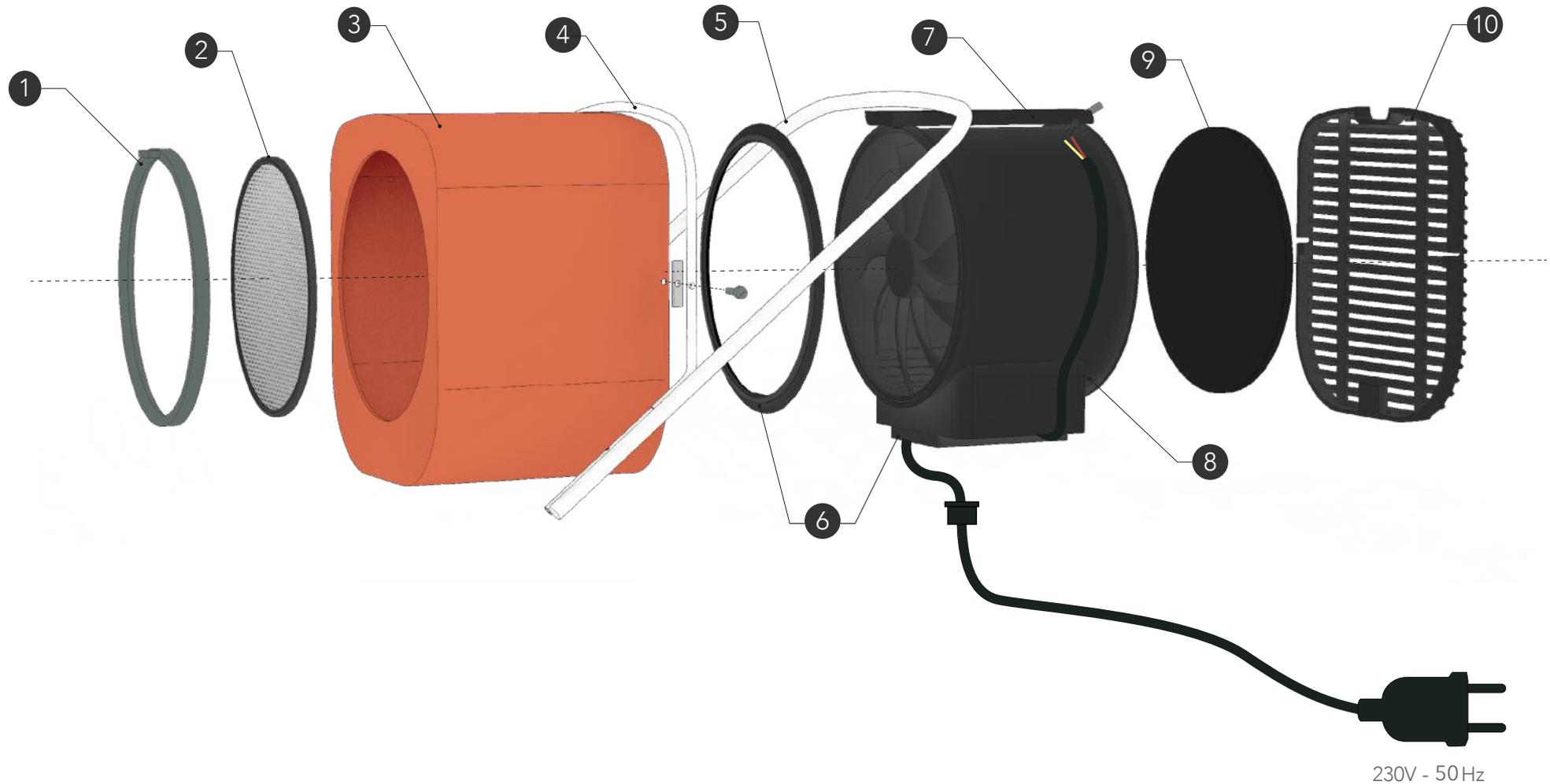


Portable Stand

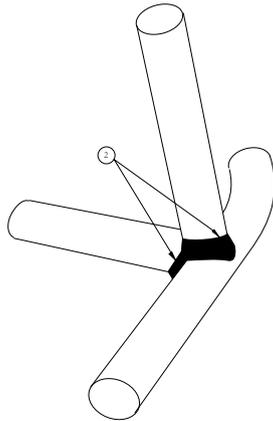
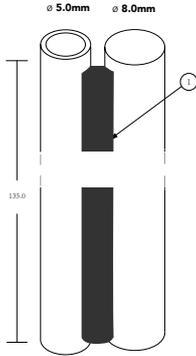
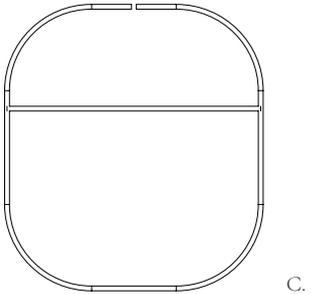
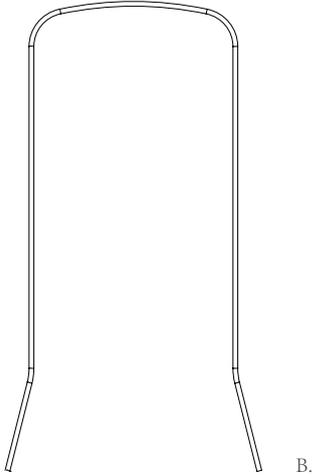
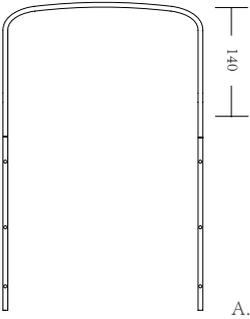
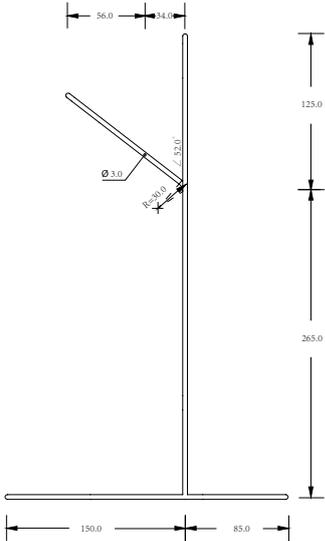
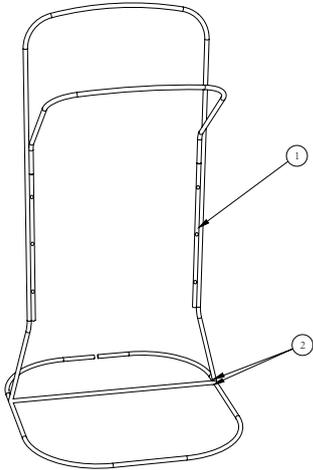
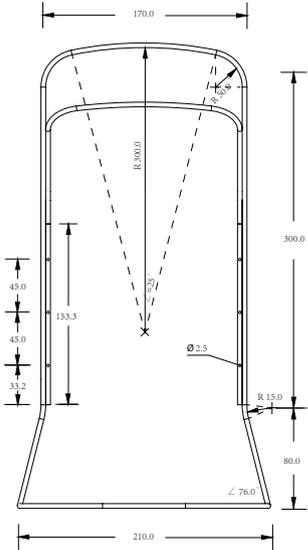
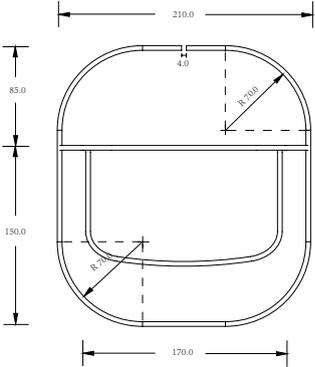


Structure

- 1 **Metal ring**
Chrome Plated Steel
- 2 **Oil filter**
Aluminium & Black Silicon
- 3 **Housing**
Zinc Plated Steel
- 4 **Adjustable frame**
Painted Steel Tube
- 5 **Handle frame**
Painted Steel Rod
- 6 **Internal structure**
Black Silicon & Shiny Black Polycarbonate
- 7 **Switch 2 positions**
Shiny Black Polycarbonate & Copper
- 8 **Motor**
Shiny Plastic PA / Ø 125 mm
- 9 **Activated charcoal filter**
Activated Charcoal & Black Polyester Fabric
- 10 **Diffuser**
Mat Black Polycarbonate



Technical Drawing



Frame	A. Adjustable Frame B. Handle C. Base	Measurements, mm
Steel	1 Flare V Weld 2 Fillet Weld	

Reflection

This project has been a great learning experience for me in many ways.

Although it's hard to engage the users, some key insights are obtained through interview and photos. Several main needs in the define phase such as easy moving around, and exhaust effectively are generally expressed in the final products, while few desired features such as space for storing ingredients turned out to be hard to integrate.

Besides, several key processes are worth highlighting for reflection.

1. A set of kitchen products or only one product?

The brief started from the whole kitchen, thus, it's easy to come up with developing the whole set of products. However, when performing user interviews, it appears that people are using the portable induction cooker already. Besides, developing a portable sink for food preparing seems not so practical. That's why I decided to neglect these two in the product define phase, instead, only focusing on the kitchen hood.

2. Convey the portable/adjustable

The overall base expressed a strong portable feeling for the products, which is explicit. While for the adjustable feature, it didn't stand out to say for itself. I would start looking into defining the feature of adjustable height if redoing this part. Should I convey it stronger with other elements or just keep it the way it is?

3. Evaluation of the products

Partly due to the no access to the workshop and lack of engagement with the users, the evaluation of the products are not performed in a convincing way. Though the rough mock-ups during the process might be the alternative to some extent, it's still hard to settle the details such as the diameter of the tube etc.

Also, more user testing should be performed on filter changing or adjusting the height of the exhaust in the later development.

4. Handle as a hanger should be prohibited

The function of placing kitchenware on the handle is the idea that consists with the desired feature, while do lack the consideration for the behaviour and safety aspects. To reconsider this function, or maybe prohibited, it might be feasible to increase the radius of the handle, to avoid the affordance of being a hanger.

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