

Hwa Chong Institution project work

Category 3

Inventions Log Book

Title of Project: Non-slip Hook

Group name: Non-Slip Hook

Group Members:

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- 2) Goh Yi Hao (8, S1P3)
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1. Problem Finding

(The beginning...)

Identify a problem you would like to solve. You may want to brainstorm for problems using different approaches e.g. thematic, survey or general brainstorming etc.

1 A Document a list of problems you have identified. Your documentation should show clearly how your group came up with the problems.

The utensils keep falling into the bowl of food if left alone due to the grease

Global warming

Hygiene issues on touching phone due to pandemic

How after the rain the umbrella is wet and cannot be kept inside the bag due to the water on it

1 B You should have selected a problem based on some considerations. Identify and justify these considerations.

The utensils keep falling into the bowl of food if left alone due to the grease. The spoon length is less than the diameter of the bowl, thus leading the spoon falling inside. This creates the issue when one has to either put fingers into the bowl to retrieve the cutlery (which is very unhygienic) or one has to replace the cutlery which is very inconvenient

1 C List some problems your group would like to solve. List also the considerations for selection of problems in the evaluation grid below. Score the considerations, against the problems, with points 1 (least significant) to 4 (most significant). Sum up the total points for each problem. Identify that problem you would like to solve.

Problem Evaluation Grid

*add more columns and rows where necessary

Considerations for Selection	Problems		
	Non-slip hook	Eco friendly straws	Appliance to make it easier to cut thorns
Raw Cost Higher less cheap	5	3	3.5
Appeal	5	4	2
Manufacturing cost Higher less cheap	5	5	3
Total Score	15	12	8.5

2. Define the Problem

Now that the problem has been identified. It is important to gather information on the extent of the problem and/or evaluate the usefulness of existing solutions based on *some criteria*. You may need to conduct surveys and research on existing solutions.

2 A Extent of problem (Research and discuss the problem and write down the problem statement)

Firstly, we found out that many people face the problem of utensils dropping or slipping into their bowls. (e.g. spoon/fork becomes soaked in your soup). These problems constantly cause people to get annoyed, which affects the person and the people around them directly. We conducted a survey, and the results were - 68% of the respondents faced the problem, while 74% of respondents welcome our product.

2 B Compare and contrast the existing or similar solutions.

We found online that there were several other similar products. However, the main difference is that their products were attached to the utensils and cannot be separated. However, our product can be separated and attached to all sorts of utensils. This is much more convenient since the need to bring the entire set of cutlery is no longer needed.

3. Your BIG IDEA#

(Developing the idea....)

Write down your proposed invention and why you want to do it. State also how you think your proposed invention is better.

3 A Describe your proposed invention.

The invention is called the 'Non-Slip Hook'. It is shaped in a hook where it can be hooked on a bowl with the cutlery to prevent it from slipping in. The hook can be inserted through any cutlery through a compartment which has an opening, and this would lock the cutlery in place so it would not slip, a contrast to the name 'Non-Slip Hook'. There are also ridges on the hook and the opening to add more friction, therefore improving the 'Non-Slip Hook'

3 B Explain the purpose of your proposed invention and the potential benefits to users.

To solve the problems of utensils accidentally dropping into bowls of food and therefore coming in contact with other unhygienic surface. Having to change cutlery everytime the cutlery slips into the bowl and contaminating food with the cutlery which had come into contact with dirty and unhygienic surfaces. The benefits are helping to prevent Covid-19 infections as the Non-Slip Hook would decrease contact between humans and dirty surfaces. The product also helps save

water as it would prevent cutlery from slipping into the bowl so there is no need to replace with another clean cutlery and thus reduce wastage of water.

3 C In what ways would your proposed invention be different and/or better than existing solutions, if any?

Our invention is a hook. It can be attached to any kind of cutlery and used universally. Although there are other types of cutlery with hooks, the cutlery is attached to a specific cutlery so it cannot be removed to be used on another cutlery. Therefore, the 'Non-Slip hook' is much more useful. Besides that, the 'Non-Slip Hook' can hang on racks for fast drying, is lightweight, portable, small and made out of a strong material which is silicone rubber.

3 D What are some problems you expect in the course of your proposed invention?

- Cannot be mass produced due to expensive manufacturing machines.
- Easy to copy design due to simple design.
- Cannot stop others from copying due to lack of copyright.

3 E What and when are the major milestones (project timeline) in your invention?

10/1: Formation of our group.

12/3: 82 participants took part in our survey and we collected the results.

1/4: We discussed the exact functions of our product.

7/4: We started creating our presentation.

14/4: We finished creating our presentation.

11/8: Preparation for final evaluation.

12/8: Final evaluation.

17/8: Completion of written report.

#must be able to be constructed based on current / emerging technologies, must not violate the laws of Science or go against the laws of nature.

4. Proposed Construction or Modelling Process*

(This first... then that...)

You are now onto the fabrication of your prototype/ product. You need to select material and understand how to put them together so that your prototype/ product can perform its function.

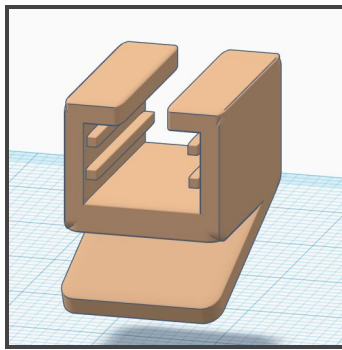
4 A Explain how and why the materials were chosen for the prototype/ product of your invention

We choose Silicone Rubber as it has the ability to withstand high and low temperatures and it is also very strong and will not break easily.

4 B Explore these considerations that may guide the construction of your prototype/ product.

Firstly, we looked at the material. Our product is silicone rubber, and the reason we chose it is because it is waterproof, flexible and heat-resistant. Our product will be able to withstand the high temperatures absorbed by the utensils and it will also be able to fit into most cutlery and most importantly it is “quick-drying”.

4 C Propose how the prototype/ product will be constructed or developed. You may use drawings and photographs.



So, this is the 3D design of the final product

1. Use **sandpaper** to roughen the silicone rubber
2. Then, clean the surface with a **soft** cloth.
3. Saturate the silicone rubber with an adhesion promoter for poly's.
4. Spray one of the silicone rubber surfaces with a **solvent based** Activator/Accelerator (AA).
5. Warm **both** surfaces with a hair dryer/heat gun.

This is a method found on google to glue pieces of rubber together.

This would ensure that the pieces of silicone rubber stick together firmly and it will not come off. Thus it is a one piece design.

5. References

Read <http://www.bibme.org/citation-guide/apa/> on how to cite references.

6 A Cite the references you have used for your project work. Your source of reference should come from different types (eg books, magazine, websites, journal articles, interview, photographs, product brochure, reviews etc.)

Google

https://www.shinetsusilicone-global.com/catalog/pdf/rubber_e.pdf

Other than that, our idea was pretty much original with no reference from any sources! :)))

