

Hwa Chong Institution
Project Work
Category 3 Inventions Log Book

Title of Project: Project Hang-In-There
Group Name: Project Hang-In-There
Group Members: Paxton Chng 3P1(index) (Leader) Glendon Cheah 3A2(index)

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.

- We find that our conventional hangers tend to snap easily when bent slightly. In addition, we found out that “shoulder bumps” are often found on our clothes after hanging, so we decided to work on a space-efficient, cheap, durable and adjustable hanger.
- Existing products are relatively bulky and heavy, with some snapping easily.
- Products are quite costly with some hangers costing up to 15\$ each.

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

We decided to work on the first problem which is the fact that existing products are relatively bulky and heavy, with some snapping easily. Hence, many people spend a lot of money on such clothing hangers as they break easily. For instance, it is required for someone to bend the hanger slightly in order to insert into one’s desired clothing. However, this may result in the hanger snapping easily due to the materials’ low quality. Furthermore, using these hangers can cause damage to one’s clothes as one is required to yank the collar open to insert the hanger if the piece of clothing is not openable from the front. Therefore, the clothes may end up loose or even torn if one is not careful.

We aim to make a product that eliminates this entire procedure of forcefully inserting hangers into the clothes so that either the clothes, or the hanger, is not damaged.

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		
	Conventional hangers snap easily when bent slightly. They also cause "shoulder bumps" on certain clothings.	Basket with a built-in pedal to be fitted on shopping trolleys	
Size (meaning that the product can be built to scale)	4	3	
Competition (No. of similar products on the market)	2	3	
Difficulty level (Building of the product is within our capabilities)	4	2	
Total Score	10/12	8/12	

2. Define the Problem (This is one...)

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)

The hangers in the market currently are either durable but bulky or light but brittle. All mainstream hangers require one to yank open the collar of the piece of clothing to insert the hanger. This can cause the clothing to be damaged as yanking at the collar will make it loose.

2 B Compare and contrast the existing or similar solutions.

Product	Weight	Cost	Features
Space-saving Foldable Multi Clothes Hanger	450 grams	SGD 14.90	Sturdy, durable, and space-efficient.
8 in 1 Folding Hanger with 360 degree Rotating Hook	--	SGD 9.90	8-in-1 design, 360 degree rotating hook, and sturdy.

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.

Our proposed invention is to create a clothes hanger with a push pull mechanism and multiple built-in holes for users to adjust to different angles so as to prevent potential damage to clothings.

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

Our product incorporates built-in holes to allow for different angles at which clothes can be hung. This can help us tackle two problems at once, with one of them being hanging clothes with ease and reducing damage done to clothes when they are being hanged.

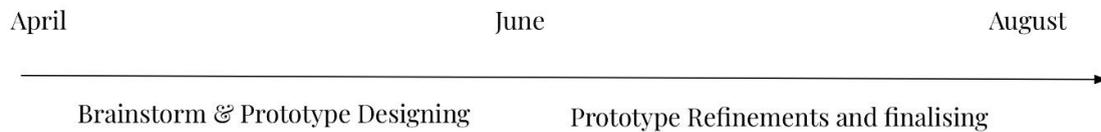
3 C In what ways would your proposed invention be different and/or better than existing solutions, if any?

We intend to make our proposed invention more affordable than existing products that can cost up to 15\$ each, all without compromising on quality as our main goal is for it to be durable and not flimsy.

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

We will have to experiment with different angles at which it is best for clothes to be hung such that there would not be any damage. We might also run into some setbacks with the adjusting mechanism.

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



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. 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

PVC- The PVC is the perfect material for our prototype because it is sturdy as well as cheap. The aim of our product is to not only ensure that the quality of the clothes that we hang on the hanger itself is not damaged by the hanger (i.e 'shoulder bumps').

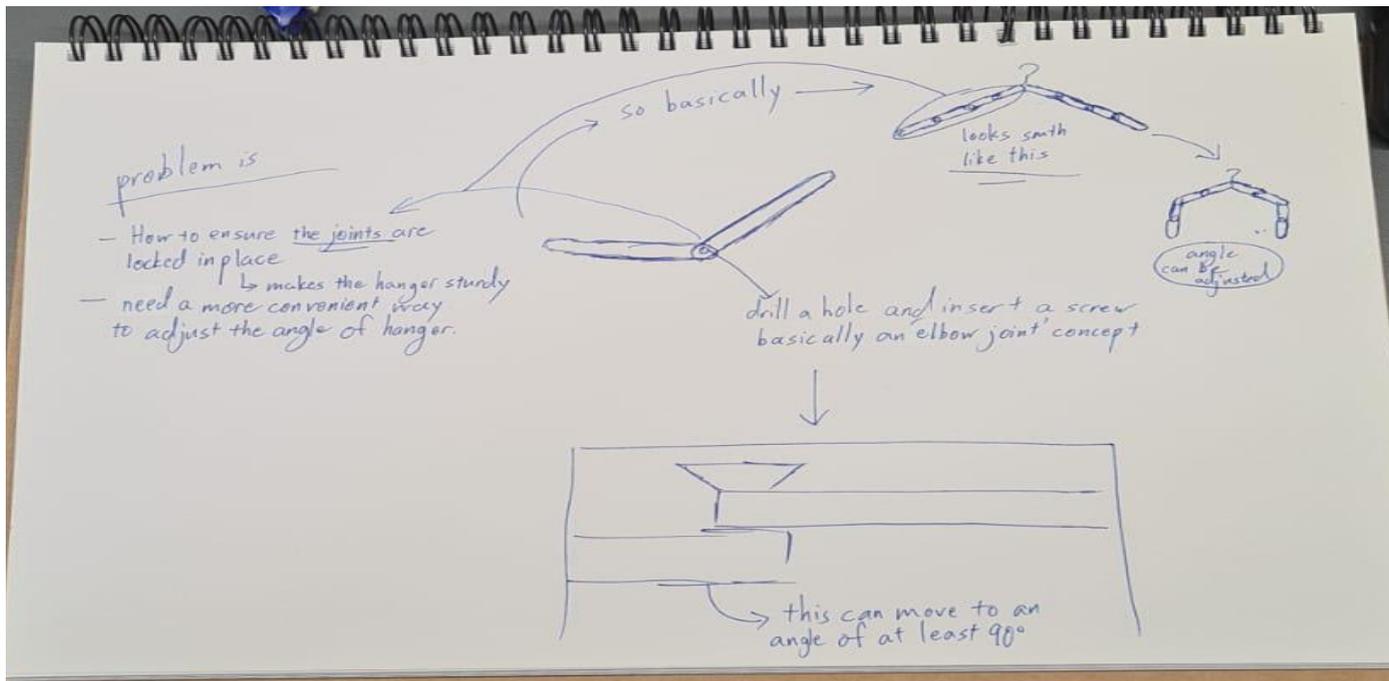
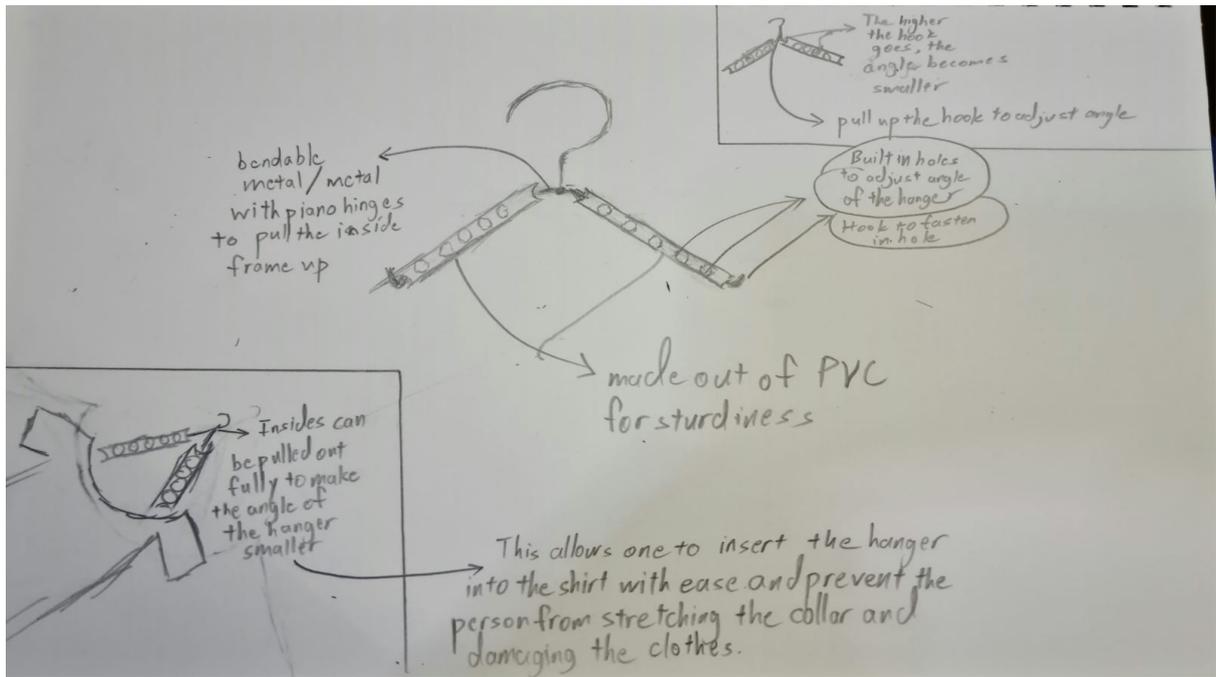
Rubber Foam- Because PVC is a relatively frictionless material, clothes may just slip off when hanging, therefore this rubber foam will be used as padding to wrap around the shoulders of the hanger to prevent clothes from slipping off, much like velvet but a cheaper and more cost-effective alternative.

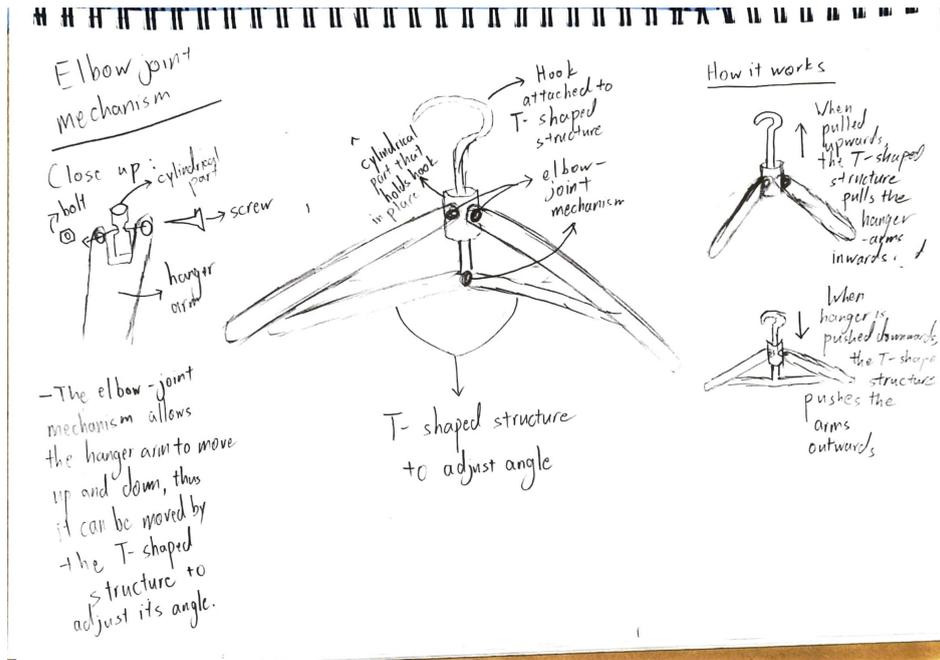
Rubber- It is an abrasive material that will be used to hold the folding mechanism in place.

Screws and Bolts- This would be used to fasten the elbow joints which is the main mechanism of our prototype as it would facilitate the folding of the hanger for easier hanging

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

4 C Document the prototype/ product development stages. You may use drawings, photographs or videos.





OR

If construction of the prototype is not possible, then you have to create an animation / as a proof of concept that it can be applied on a bigger scale.

4A Explain why construction of a prototype is not possible and the proof of concept is needed in your case.

Unfortunately, because of the COVID situation, our group was unable to produce a prototype because places where our prototype could be manufactured like the MakerSpace was closed in July when we initially wanted to begin building the prototype.

4B Briefly explain how the video / animation can effectively show how your invention will work and the different considerations.

It will show how the various mechanisms of the hanger such as the elbow joint would allow for greater flexibility when hanging. Additionally, it's extra-wide design which would be featured on the model would prevent "shoulder bumps".

Warning:

- Video / animated simulation only if prototyping is absolutely not possible.
- Video / animated simulation must be logical and convincing that the invention works.
- Constraints must be clearly included in the logbook or the project will be heavily penalized.

5. References

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

5 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.)

7 Hangers That Don't Leave Shoulder Bumps. Retrieved on 1 April 2021:

<https://www.hangorize.com/blogs/tips/hangers-no-shoulder-bumps#:~:text=The%20cause%20of%20many%20shoulder,a%20case%20of%20the%20lumps.>

Rubber Foam. Retrieved on 11th August 2021:

<https://shopee.sg/Firm-Foam-Rubber-Replacement-Cushion-Great-for-boat-seats-and-benches-i.33213512.1156868334>

Screws and bolts. Retrieved on 11 August 2021:

<https://shopee.sg/304-Stainless-Steel-Hexagon-Bolt-Screw-Nut-Set-Big-Full-Screw-i.163487604.4202532361>