

Hwa Chong Institution

Project Work

Category 3 Inventions Log Book

Title of Project: <u>Burns begone</u>
Group Name: 03-25
Group Members: 1)Guo JiaHong 2)Benson Ooi 3)Austin Foo 4)

1. Problem Finding

(The beginning...)

Identify a problem you would like to solve. You may want brainstorm for problems using different approaches eg 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.

Getting burnt

Our group members were brainstorming for problems when Benson remembered his Mother getting burnt when cooking many times thus we decided to make a product that would help us decrease the chances of getting burnt.

Poisoning

There were many news about people eating Tide Pods and thus we want to prevent that from happening to young kids.

Falling down from a height

A group member's sibling had fallen off a shelf recently and thus we wanted to create something to prevent such falls.

Suffocation

One group member choked some rice while we were discussing problems during lunch break.

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

1. Viability(Can we solve it in 4 months time?)
2. Significance of problem
3. Usefulness(Is it needed?)
4. Safety(Is the process of making the product safe?)

1 C List some problems your group would like to solve. List also the considerations for selection of problem 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			
	Poisoning	Suffocation	Falls	Burns

Can it be solved?	2	1	3	3
Is it needed?	4	2	1	4
Safety	3	3	2	4
Seriousness	4	4	4	4
Total score	13	10	10	15

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)

People cook very often and risk getting burnt if they use a gas stove, how might we invent a product that prevent burns and at the same time not affecting their cooking experience?

We did a survey to find out about the extent of the problem.

81.6% of the respondents used gas stoves.

60.5% of respondents felt that a product that helps you prevent getting burnt when cooking will be useful.

Thus we concluded that our project is viable and significant to the public.

2 B Compare and contrast the existing or similar solutions.

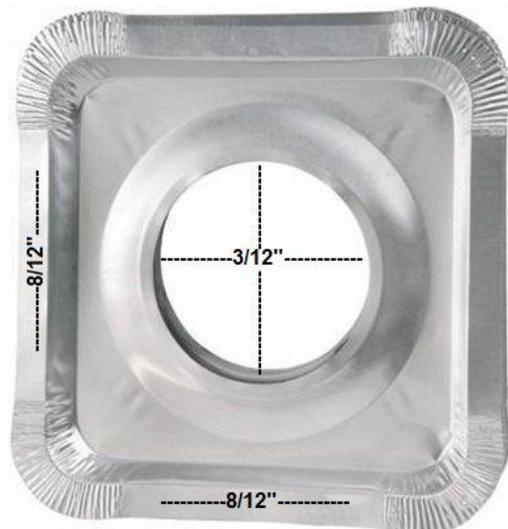
1. Hanamal Stove Guards

Pros:

- Keeps your stove clean
- Very affordable(\$9.99 for 12)

Cons:

- Does not protect user from burns
- Is disposable and might contribute to waste
- Gets burned easily



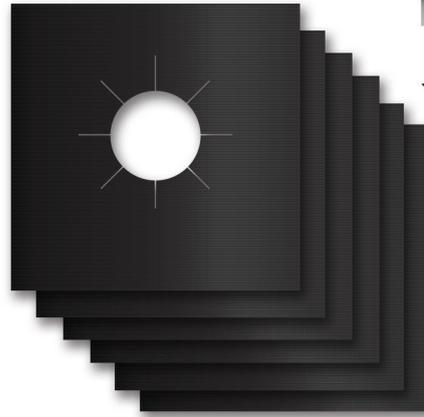
2. Geekper gas range protectors

Pros:

- Keeps stove top clean
- Easy to remove
- Reusable once rinsed
- Does not burn easily

Cons

- Does not protect user from burns
- Quite expensive(\$14.99 for 6)



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.

An object shaped like a truncated cone to put over gas stove hobs that pots and pans can rest on, stopping the heat from the flames from escaping and thus preventing the user from getting burnt while directing heat up towards the opening to heat the pots and pans. It would be made out of a material that is a poor conductor of heat, lightweight, clear, easy to wash and durable. It can be removed to be washed.

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

It can prevent users from getting burnt when cooking as it would be made of a non heat conducting material, while allowing the user to be able to watch the flames while cooking due to the material being clear.

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

Our invention would be able to protect the user from the flames in addition to what thothers can do, which just basically keeps the stove cleaner. This way, you can cook without needing to fear burning your hand as much.

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

- Sourcing for materials
- Moulding materials into product due to the fact that we were unable to obtain fibreglass.

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

We are planning to finish making the first prototype by around May. May and June will be used to improve and make the prototype.

#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

The material chosen is Silicon. Even though it's very difficult to obtain, it serves as a good insulator of heat. It's considerably cheaper compared to other insulators as well as light-weighted. For the outer base however, we planned to use Fibreglass but it's literally not possible to obtain so plastic was used. However, if we were able to actually obtain fibreglass, this is why we chose it- Also cheap, light-weighted and a very good insulator of heat.

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

If we aim to build a heat insulation product, we would need to use the following criteria--A good insulator of heat. Due to our plastic container being not as heat resistant, we had to line it with the silicone. For the production, we have to think about the cost- Not too expensive. We wanted our product to be accessible to everyone, thus we didn't use too expensive materials.

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 in a bigger scale.

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

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

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. Modification and Evaluation

Upon the completion of your prototype/ product, you would need to see if it is working the way you want it to work. Check if your product has met the identified purpose and the user's need; and implement necessary modifications and improvements. This process may take several rounds.

5 A Write down your prototype/ product test criteria and check against it if it works. Identify areas of weakness for modification. Indicate the test iteration and date of test.

Test Iteration:	Tick			Remarks
Test Date: 2018/8/16	Pass	Fail	Potential Failure	
Does it feel very hot when touched?	Yes			Just feels a little tiny bit warm when touched. Won't get any burns though.
Does the pan/pot stay still when on top of the structure?	Yes		yes	Wobbles a bit when it's flipped upside down and jiggle it.
Did the silicon burn or get damaged at all?	No, it didn't			Stayed the same throughout which proves that it works.

*Add more rows for more criteria

** Repeat table for next test iteration

OR if you are creating an animation / video to show how your invention will work, write down the different possibilities / outcomes [success or failure] if a full-scale prototype is to be constructed.

6. References

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

6 ACite 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.)

- M. P. (2013, May 30). The Top 5 Causes of Home-Related Accidents. Retrieved from: <http://www.delmartimes.net/sddmt-the-top-5-causes-of-home-related-accidents-2013may30-story.html>
- Fibretech incorporated. Fiberglass Benefits. Retrieved from: <http://www.fiber-techinc.com/capabilities/extras/fiberglass-benefits/>
- Mercedes Martinez. (Updated September 26, 2017) Induction cooker disadvantages. Retrieved from: <https://homesteady.com/list-6869767-induction-cooker-disadvantages.html>
- Sarah (Updated March 01, 2018) The Little Discussed Dangers of Induction Stoves (and what to buy instead). Retrieved from: <https://www.thehealthyhomeeconomist.com/induction-stove-dangers-what-to-buy-instead/>
- Kim Severson. (April 6, 2010) Is Induction Cooking Ready to Go Mainstream? Retrieved from: <https://www.nytimes.com/2010/04/07/dining/07induction.html>
- buying.guides.(March 4, 2015) Everything You Need to Know When Buying Stove Burner Covers for Ranges and Ceramic Cooktops. Retrieved from: <https://www.ebay.com.au/gds/Everything-You-Need-to-Know-When-Buying-Stove-Burner-Covers-for-Ranges-and-Ceramic-Cooktops-/10000000205233146/g.html>

