

Hwa Chong Institution

Project Work

Category 3 Inventions Log Book

Title of Project: Portable Clothes Dryer
Group Name: 3-07
Group Members: 1A2 1)Joshua Yeo 2)Tham Han Yan Tristan 3)Tan Le Ruey 4)Choong Qian Tai

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

Household had the highest number of points hence we decided to help improve it. There are a wide variety of household problems. Since everyone experiences household problems, it is a severe and complicated problem which affects a large number of people. Although there are a fair number of solutions for these problems, these solutions may not be reliable and may have a high cost. As household problems can be solved easily with simple solutions, we have chosen to solve this problem as our invention would be easy to make and we are able to make it in a short amount of time.

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

Bacteria will grow on the wet clothes and anyone who uses them would mostly get ringworm.

Ringworm develops mostly on the top layer of the skin. It is a red circular rash with clearer skin in the middle and it may itch. This is a huge problem as 300 million people are affected by ringworm worldwide. As wet clothes will get mouldy when they are left indoors due to sufficient moisture and nutrients, people wearing these mouldy clothes get ringworm. Moulds can even cause nasal stuffiness, throat irritation, coughing or wheezing, eye irritation, or, in some cases, skin irritation to people who are sensitive to them.

3 A Describe your proposed invention.

Our invention consists of two wooden platforms on top and at the bottom. Both the wooden platforms have holes at their corners to place the extendable metal poles. The bottom wooden platform has a dehumidifier to dry the clothes. The top wooden platform has 3 hooks to hang the clothes and ensure there is ample space between them. There are plastic sheets on the wooden platforms so that the wood would not get wet.

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

In Singapore's climate, it is humid and rains often. When it rains or when there is no more space in the balcony to sun dry the clothes. Therefore, these clothes get mouldy. People can use our invention to dry their clothes to prevent mould and bacteria from growing on the clothes. This portable clothes dryer can also be used by people who travel often and dry their clothes after washing as it is convenient and easy to use.

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

Panda Portable Ventless Folding Drying Machine With Heater. It takes very long to assemble and Weight of clothes has to be evenly spread out between hangers or it will tilt to one side and the hanger will come off. All clothes will come out stiff except hockey gear. It cannot dry long sleeve clothes without putting the sleeves into the shirt which cause wrinkles on the shirt.

Smart Portable Electric Clothes Dryer ◀ foldable travel clothes and shoe drying rack hanger dorm room. It can only dry one laundry at a time and it takes 3 hours to dry a piece of clothing. In the sun, a bunch of clothes can be dried in 8 to 14 hours, while the hanger can only dry approximately 4 pieces of clothing in 14 hours.

Mini dryer air o dry portable folding clothes dryer dryer clothes dryer. It takes very long to dry clothes and it wears out easily. The clothes will come out extremely wrinkled and it can only hold 9 kg of clothes.

Our proposed invention would be smaller than the 2 heaters except the Smart Portable Electric Clothes dryer. However, our invention can dry 3 clothes at once and it has an extendable pole for clothes of various lengths.

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

The wood may get wet. The heater might not be hot enough to heat up the entire clothing.

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

We changed the design of our prototype twice due to a lack of resources. The first prototype was supposed to be a rack and we wanted to put our heater on the rack. However, we could not make a suitable rack because the heater was too hot and we could not find the right length of metal pole.

Our second prototype was to use batteries to dry clothes. We intended to connect batteries with wire so that when the batteries heat up, we can hang the clothes on the batteries. However, we realised that that was too dangerous and the batteries might be a one-time use and might explode too.

We managed to come up with a new design and got the resources for it. Our current design is a wooden plank with holes drilled into it. There is a heater at the bottom of the plank and we can hang hangers into the holes drilled to dry clothes.

We decided to cover the wood with a plastic sheet so that it would not get wet. We placed hooks to hang the hangers instead of holes. We showed a slide on our test with 3 t-shirts and 3 pants using the previous prototype.

We decided to use 2 wooden platforms and connect them with metal poles. The heater will be placed on the top of the bottom plank. There would be hooks on the bottom part of the top plank. We can place hangers on the hooks and hang the clothes.

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

We chose wood because it is firm and durable. We used three clips which were strong enough to hang the clothes dryer up for easy use. We also used a dehumidifier so we can dry the clothes from the bottom up.

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

-Firmness -Durability -Thickness -Length -Breadth

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: 28 June-3 Jul	Pass	Fail	Potential Failure	
Portability	✓			Our dryer was compact and small.
Able to dry clothes quickly	✓			A wet handkerchief was dried within 30 mins.
Durability	✓			The materials we used were strong, firm and sturdy.

Test Iteration:	Tick			Remarks
Test Date: 20 July	Pass	Fail	Potential Failure	
Portability	✓			Our dryer could be dismantled.
Able to dry clothes quickly	✓			Our t-shirt was dried in 7 hours 13 minutes.
Durability			✓	The materials we used were strong, but when we combined them together it was unstable

Test Iteration:	Tick			Remarks
Test Date: 1 August	Pass	Fail	Potential Failure	
Portability	✓			Our dryer could be dismantled.
Able to dry clothes quickly	✓			Our t-shirt was dried in 7 hours 2 minutes.
Durability	✓			The materials we used were strong, firm and sturdy.

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

[Qoo10. \(n.d.\). \[US\\$35.40\]\(▼1%\)Air o mini dryer dry portable folding clothes dryer dryers clothes dryer. Retrieved from https://m.qoo10.sg/item/AIR-O-MINI-DRYER-DRY-PORTABLE-FOLDING-CLOTHES-DRYER-DRYERS-CLOTHES/560553716?_ar=Y](https://m.qoo10.sg/item/AIR-O-MINI-DRYER-DRY-PORTABLE-FOLDING-CLOTHES-DRYER-DRYERS-CLOTHES/560553716?_ar=Y)

[The Ringworm Irradiators. \(2015, March 31\). Retrieved from](#)

(n.d.). Retrieved from <https://www.lazada.sg/products/smart-portable-electric-clothes-dryerfoldable-travel-clothes-and-shoe-drying-rack-hanger-dorm-room-i147842260-s182700350.html>

The Ringworm Irradiators. (2015, March 31). Retrieved from <http://blogs.discovermagazine.com/bodyhorrors/2015/03/31/ringworm-x-ray/#.XR1IeuszbDc>

Panda Portable Ventless Cloths Dryer Folding Drying Machine with Heater ``customer reviews. (n.d.). Retrieved from <https://www.amazon.com/Panda-Portable-Ventless-Folding-Machine/product-reviews/B01AVGCPN2>

Annex

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

Criteria	Complications	Number of people affected	Lack of solutions	Feasibility to improve it	Total
Fungal infections	3	4	2	2	11
Food wastage	2	5	3	2	12
Pollution	4	5	3	2	14
Climate change	5	5	4	1	15
Disabilities	3	3	3	5	14
Parkinson's	2	2	3	3	10
Drunk driving	2	2	3	2	9
Household	5	5	3	5	18

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

Considerations for Selection	Problems		
	Wet clothes	Pest infestation	Indoor air pollution
Complications	4	4	4
Lack of Solutions	2	2	2
Feasibility of treating from source	4	3	3
Total Score	10	9	9

2 B Compare and contrast the existing or similar solutions.

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







