

DEVELOPMENT OF SIMPLE SHOE DRYER APPARATUS

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ABSTRACT

This project is about Development of Simple Shoe Dryer Apparatus that can be used to help people drying shoes in a short time. The objectives in this project are to create an easy method to dry a shoe in a short time and it can be used in many situations. Besides that, to design and fabricate an apparatus that can help in drying the shoes with simple action. This project involves the process of designing the simple shoe dryer by considering the functionality, shape, environment fitting, heating element, and the manufacturing cost for people to use it. The material of this design is easy to gain it, because it only using zinc sheet metal as raw material. So that the method joining that can be compatible in assembled this simple shoe dryer is rivet set processes. In assembled the wheel below the product, welding process is suitable because it will heat and melt the origin metal to joining. This project also required analysis to make sure the heating element for drying of the product to ensure the safety for the user indeed of publishing. After all the process had been done, this simple shoe dryer apparatus may help us to understand the fabrication and designing process that involved in this project.

ABSTRAK

Projek ini adalah tentang penghasilan suatu benda baru untuk alat pengering kasut yang mudah. Ia boleh membantu manusia untuk mengeringkan kasut dalam masa yang singkat dan cepat. Oleh itu, objektif utama untuk menghasilkan alat ini adalah untuk menghasilkan satu kaedah atau cara yang mudah untuk mengeringkan kasut dalam masa yang singkat dan boleh digunakan di mana-mana sahaja. Projek ini melibatkan proses untuk membentuk alat pengering kasut dengan mengambil kira dari segi tujuan dibuat, bentuk, kesesuaian persekitaran, elemen pemanasan yang digunakan dan juga dari segi kos penghasilan untuk kegunaan ramai. Bahan untuk menghasilkan alat ini adalah dari sumber yang mudah diperolehi, ini kerana ia hanya menggunakan kepingan zink besi keluli sebagai bahan utama. Oleh itu, untuk kaedah penyambungan yang sangat sesuai adalah menggunakan set rivet sebagai penyambungan kekal. Dalam penyambungan roda pada bahagian bawah produk, kaedah kimpalan adalah sesuai kerana ia akan memanaskan dan mencairkan logam asal untuk disambung. Projek ini juga dicadangkan untuk dibuat analisis dari segi elemen pemanasan untuk pengeringan pada produk supaya keselamatan pada pengguna diambil kira oleh pengeluar. Selepas semua proses selesai, alat pengering kasut mudah ini boleh membantu semua untuk memahami proses mereka cipta dan pembuatan yang berkaitan tentang projek ini.

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1.2 Problem Statement

For this apparatus, current shoe dryer is not safety because the risk to get a short circuit is high. This is because about the material that using is zinc. The shoe dryer is incomplete with a guard as safety because it is involve an electric supply as a hazard term. The apparatus size is too big and heavy. But for the future improvement, it required have only state one pairs of shoes. Another that, the shape of apparatus is not ergonomic. It is because like a box shape and not attractive.

1.3 Project Objectives

Basically this project is based on these two objectives:

- To introduce an easy method to dry a shoe in short time and it can be used in many situations.
- To design and fabricate an apparatus that can help in drying the shoes with simple.

1.4 Project Scope of Work

These projects are about design and fabricate a simple shoe dryer apparatus. It is because, many types in current market is not have a safety and not attractive. This apparatus required must be made from sheet metal. The sheet metal has chosen is zinc. The thickness is 1.0 mm. This project is used zinc as raw material because zinc is soft, compares the other material. Besides that, it also easy to get a curve shape that want. These apparatus is using two light bulbs and two of exhaust fan as the heating element for the project. The light is having hundred watt of power and the exhaust fan have 220 / 240 AC power for each. The apparatus is also using an electric supply as main source.

CHAPTER 1

INTRODUCTION

1.1 Project Synopsis

Final year project is one of the compulsory subjects for every diploma final year students. This subject is taking on semester five of the study. In this subject, a project needs to do to fulfill the subject requirement. The project involves development of simple shoe dryer apparatus. This apparatus could be use by every people that need it to dry their shoes in short time.

This project title is about Development of Simple Shoe Dryer Apparatus. This shoe dryer is simple. It is because, just plug it on the switch prepared and store the shoe inside the space until they are dry again. The simple shoe dryer is safe, silent, efficient way to dry any shoe overnight. The apparatus with the use of thermal convection drying from light bulb that which means that warm air naturally rises, the shoe dryer can dry any shoe in 5 to 6 hours safely. The simple shoe dryer will make the shoes more comfortable each day while protecting the shoes investment. Another that, the simple shoe dryer is suitable for removing the perspiration, wetness and odour from the shoes. It is because; the shoe dryer is complete with an air space on both of the apparatus. The light bulb is select from their high power watts to give a high heater to the shoes. Others, the shoe dryer is not too large but it can store only 2 shoes on time. The material that required is also not expensive and suitable for the function.

1.5 Project Flow Chart

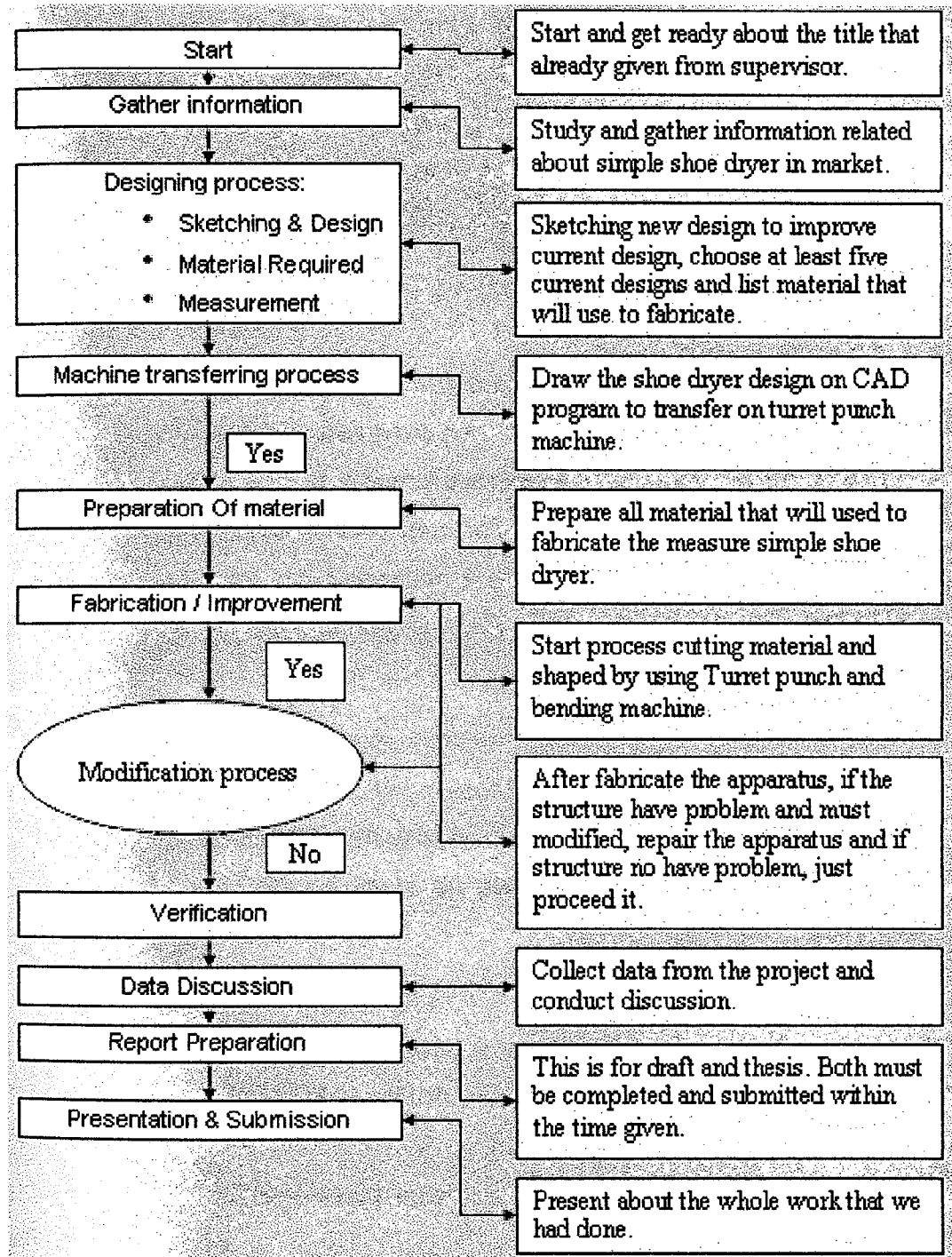


Figure 1.1: Project flow chart

1.6 Project Planning

If the Project Task is referred, the project starts with the introduction, followed by literature review, Design & measurement consideration, material preparation, methodology study, fabrication process, improvement, report writing and make a presentation on these project topics which are the Simple Shoe Dryer Apparatus. These tasks have been done through research on the internet, books, magazines and others sources.

The planning is dividing in two categories which are planning and actual items. For making a literature review part, it take one to three weeks to the planning process but an actual, that is different because it take until week seven of semester to do. After that, in design and measurement consideration of scope is about week three to week five to follow by the planning and for the actual take more than week five. In this scope, the design is thinking and makes some sketching to get an illustration about the apparatus.

In material preparation, the material that wants to use is decide by planning and actual items because the material is also important to choose before fabrication process. On the methodology study, the planning is about from week six until week eight.

After that, in fabrication scope is very important because it's important to follow the work of schedule to finish the apparatus. For the planning is only start from week six until week ten to finish. But, after start an actual activity is take a long time to complete the apparatus properly. It's about star from week seven until week twelve.

Lastly, after finish the fabrication process is make some improvement about the apparatus as good as possible in week nine to week twelve in actual term and follow the next scope until complete it.

Project Task

	Scope	Weeks													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Literature Review														
2	Design & Measurement consideration														
3	Acquisition & Material preparation														
4	Methodology study														
5	Fabrication														
6	Evaluation & Improvement														
7	Report writing														
8	Mid and Final Presentation														

Planning	
Actual	

Figure 1.2: Gantt chart

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Since a day, people are always having a problem to dry the shoes in a short of time. So, using a simple shoe dryer, maybe it only uses in a short time to dry shoes. Its mean, use this apparatus when want to dry a shoes with a short time and safely. The function of the apparatus create is want to store and dry the shoes in easy place to persons during in many situations. It is because; the shoe dryer can be store in everywhere that near the electric supply to operate it. From the statement above conclude that the simple shoe dryer apparatus is a major role as an items transferring mechanism for people without having a problem of doing that easier. Others, the apparatus are also powerful, silent, thermal action sends warm air circulating through footwear removing wetness and odor while preventing boot and shoe damage. The Shoe Dryer is ideal for all types of footwear including leather, canvas, vinyl, rubber, plastics and more. Available in electric or propane models for home or outdoor use are remove wetness, perspiration and odor safely from any footwear, overnight. Another that, it also improves foot comfort and health.

2.2 Basic Principles

The heating process of the shoe dryer is subjected fall into a few categories:

- I. Come from of two exhaust fan on apparatus.
 - II. Flow of air around the shoe dryer.
 - III. From two bulb-light (100watt).
- a) The dry element :-
- Use two units of bulb-light that large than usual Watts (power) to give the high of heat on the shoe during the dry process.
 - Another that, the exhaust fan is also supply on the apparatus. The function of the exhaust fan is an extra element of drying to the shoe. It will supply the heat in the apparatus.
- b) The time of shoes to dry :-
- After the researches on current market, the shoes are taking a long time to dry. It was around 6 to 7 hour to complete. On market product, the shoe dryer is use the high of air pressure as an element of the dry. The product is looking simple but follows the function. So, on the simple shoe dryer that want to create, it maybe take a short of time compares a usual. For this apparatus, it takes around 3 to 4 hour to dry the shoes in time.
- c) How many of shoes that can state on the apparatus in one time? :-
- It only a pair of shoes because it suitable on the objective that thinking.

d) Function of shoe Dryer :-

- Remove wetness, perspiration and odor safely from any footwear, overnight.
- Improve foot comfort and health.
- Protect your footwear investment.
- Dry and store shoes without ever unplugging dryer.

e) Advantages :-

- Easy to place in everywhere.
- The apparatus is looking simple.
- The cost of develop the apparatus is not expensive and suitable for every rank of community to get it.
- Use more than one dry element to the apparatus.
- Take a short time to dry the shoe compares a usual.

f) Disadvantages :-

- Use a high of power supply compares a usual.
- A space for state a shoes is not enough for many of shoes to dry in one time.

2.3 Current existed Shoe Dryer in Market

2.3.1 Portable Shoe Dryers at Hammacher Schlemmer

This is the portable shoe dryer preferred by our customers when they travel because they can be stored in your footwear, and when plugged into an outlet at your destination they gently, safely, silently, and thoroughly dry your footwear overnight. The dryer fits inside a shoe to gradually remove moisture, eliminating bacteria build-up without damaging the material or shape of the footwear. A 20-watt thermal convection heating process silently circulates room air into the dryer, and throughout the shoe. Easy-to-transport, the dryers are ideal for hunting trips, beach vacations, ski or hiking excursions, or out-of-town marathons. Made by PEET, inventor of the original electric shoe dryer in 1968. Can be used with Mens footwear sized 7 and up, or Women's sized 5 and up. Set of two. 2 3/4" H x 2 3/4" W x 7 3/4" L. (3 lbs.)

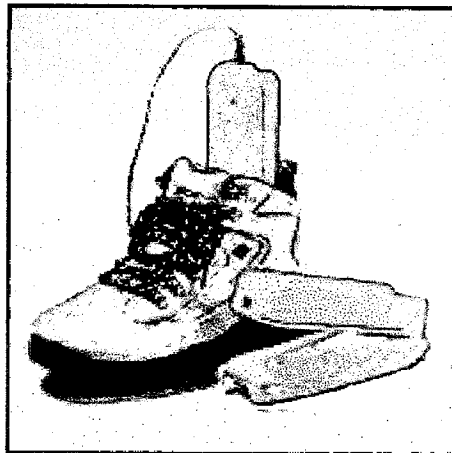


Figure 2.1 : Portable shoe dryers at Hammacher Schlemmer [5]

2.3.2 Shoe and Glove Dryer

A small fan pulls air through the shoes and gloves. In the portable unit shown here, you can turn the heat on or off. This boot dryer will also dry one pair of shoes or boots plus a pair of gloves at the same time, according to the product literature. For this particular model of shoe dryer, some thought needs to be put into supporting the unit. Other, more expensive models have their own stands.



Figure 2.2: Shoe and glove dryer [9]

2.3.3 Pro-Idée United Kingdom - UV Shoe Dryer

The ultra-quiet ventilator provides perfect air circulation. UV light fights bacteria. On your skiing holidays, hiking tours, after working in the garden or that autumn walk: However damp your shoes may be at the end of the day, they will be dry and warm by the next morning. The light from built-in UV-LEDs combats bacteria. Boost your spirits for the coming day, even if it's cold and rainy.

Dries with a 40°C warm air stream.

The flexible heating arms can be extended to a length of 21cm (8 1/4"). The air stream circulates through your shoes at 2.500 l per hour and is driven by extremely quiet ventilation technology developed for PCs.

Double safety.

A thermo switch and a thermal safety fuse prevent the ventilator from overheating and ensure gentle drying. Ideal for preformed shoe liners and insoles.

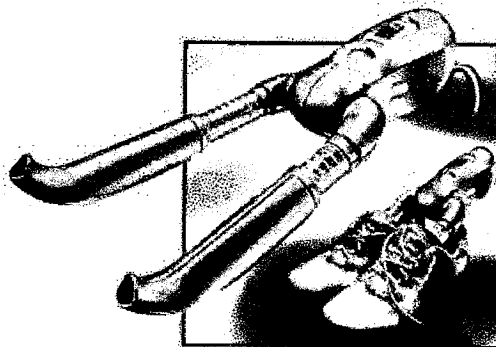


Figure 2.3: Pro-Idée United Kingdom - UV Shoe Dryer [6]

2.3.4 DryGuy DryFast - Portable Footwear Dryer (AC, DC or 12V)

The Dry Fast is a compact, lightweight portable footwear and garment dryer that operates on three power sources drying footwear and garments anywhere. Legs extend to fit and retract for easy storage. Utilizes forced ambient (room temperature) air powered by AC, DC (four C batteries not included), or 12 volt (car adapter included) to dry footwear or garment in hours.

Specifications:

- Dry Time - Approximate dry time 4 - 8 hours
- Power - 120 volt AC household outlet, DC (four C batteries not included), or 12 volt (car adapter included)
- Size - Height 12.75 in x Width 7.75 in
- Weight - 2 lbs
- Material - High quality thermoset plastics

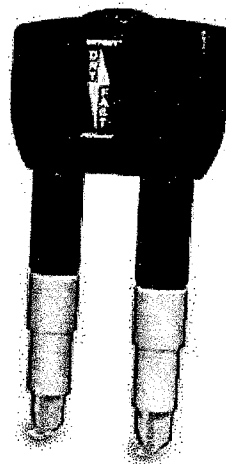


Figure 2.4 : DryGuy DryFast-Portable Footwear Dryer (AC, DC or 12V)

[11]

2.4 Part on Shoe Dryer Apparatus

2.4.1 Body

For outdoor use on the apparatus is look simple and not complicated. The body is complete with electric system to supply the heater full in the apparatus during on it. The apparatus is using the sheet metal on overall their body. On the body, it's complete with air space on both of side to give air to enter and out of the air unused in the apparatus.

2.4.2 Movement System

This apparatus is use the wheel to move the apparatus on destination. It only uses four unit of wheel. The size of wheel is not too large and not too small. The wheel is choosing because it can place the system in safe location and in balance.

2.4.3 Joining Method

The method that apply in the apparatus is not to a short time but it want in a long time uses. It is because; the material that will use is endured from the corrosion. So, for the join all of part on the apparatus, we require to use the rivet tools and also use the welding machine to join the material that have a hard. The rivet is uses because it can join the material that suitable with permanent on the surface. It also uses the arc welding to join the material.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

In fabricate of shoe dryer apparatus, there are several step must be follows. In this part, all students should be understand why chosen the material and why must chose the particular methods used to characterize the material. Methodology is important before make the product. In fabricating process, it is include about measuring, transferring, punching, bending, joining and finishing process. Project methodology is a body of practices, procedures and rules used by those who work in a discipline or engage in an inquiry and a set of working methods. All the methods that will be explained in this chapter are very important procedure to ensure it follow the entire project schedule so that it will be move smoothly. Effective methods will give clear view on how to do this project. These methods will be guidance in so that it will be finish at the right time as the planning. Whole process will be explained in this chapter also. So it will give general view of what are the steps should be taken.