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HYBRID PORTABLE STOVE

DIPLOMA KEJURUTERAAN MEKANIKAL

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ABSTRACT

This project is an invention where it uses materials that are easy to find and easy to use, with this invention, it can meet the demand of the community to overcome problems that often occur in the community. The project was created to deal with various problems the community face today especially on cooking matters. For example, the size of the cooking area used is large and uses a lot of space. Another example of the problems faced, gas tanks had to be lifted with a lot of energy and had to bear expensive electricity bills. In this project there are also several objectives that can be concluded, among them is to design a kitchen that uses battery energy to replace gas consumption. In addition, to create an eco-friendly kitchen as well as to analyze the capabilities of a Hybrid portable stove among the people. During the given period, we as a team have bought some materials to create the project and do some innovation like drilling holes in toolboxes, forming a base for the heating element, connecting wire from the battery to the switch and from the switch to the heating element, then back to the battery. We also made the connection of the wire from the battery to the switch, from the switch to the dc motor and then back to the battery, connecting the wire from the dynamo, then placed the transformer and arranged each component into a toolbox. This project can be taken anywhere and light and easy to operate, since we added a device to charge the battery after use.

ABSTRAK

Projek ini merupakan penemuan di mana ia menggunakan bahan yang senang dicari dan senang digunakan, dengan penemuan ini, ia dapat memenuhi permintaan masyarakat untuk mengatasi masalah yang sering berlaku dalam komuniti. Projek ini dibuat untuk menangani pelbagai masalah yang dihadapi masyarakat hari ini terutama dalam soal memasak. Contohnya, saiz kawasan memasak yang digunakan adalah besar dan menggunakan banyak ruang. Contoh lain dari masalah yang dihadapi, tangki gas harus diangkat dengan banyak tenaga dan terpaksa menanggung bil elektrik yang mahal. Dalam projek ini juga terdapat beberapa objektif yang dapat disimpulkan, antaranya ialah merancang dapur yang menggunakan tenaga bateri untuk menggantikan penggunaan gas. Di samping itu, untuk membuat dapur yang mesra alam dan juga untuk menganalisis keupayaan dapur mudah alih Hybrid di kalangan masyarakat. Selama tempoh yang ditentukan, kami sebagai satu pasukan telah membeli beberapa bahan untuk membuat projek dan melakukan beberapa inovasi seperti penggerudian lubang di kotak alat, membentuk asas untuk elemen pemanasan, menghubungkan wayar dari bateri ke suis dan dari suis ke pemanasan elemen, kemudian kembali ke bateri. Kami juga membuat sambungan wayar dari bateri ke suis, dari suis ke motor dc dan kemudian kembali ke bateri, menyambungkan wayar dari dinamo, kemudian letakkan pengubah dan susun setiap komponen ke dalam kotak alat. Projek ini boleh dibawa ke mana sahaja dan ringan dan mudah dikendalikan, kerana kami menambahkan peranti untuk mengecas bateri setelah digunakan.

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CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

Nowadays, cases of fire involving kitchen items, especially cooking utensils or materials such as gas bins are increasing due to the problem of the gas barrel itself or the negligence of some people when cooking. It can also increase the very high rate of loss to fire victims. Here are some newsletters taken from the MYmetro Portal involving fire cases, A man burns his hands, feet and back as soon as the gas canister in his house explodes suddenly. In the incident around 9.30 last night, the construction and roof of the victim's house in Taman Banting Baru, Selangor, also suffered severe damage. Banting Fire and Rescue Station (BBP) chief, Muhammad Fadzrul Azren Md Razif said, the victim who was still conscious was rescued by the public before the fire brigade arrived at the location around 9.52 pm. "Upon arrival, firefighters found the fire was caused by an explosion of a gas tank that had been extinguished by the public at the scene. "Investigations found that the explosion also caused damage to some parts of the ceiling and roof of the house," he said when contacted earlier. Muhammad Fadzrul Azreen said the 41-year-old victim, who works as a Grab driver, lived alone in the terrace house he rented. "The victim suffered minor injuries due to burns on his hands and feet as well as the back of his body. "The victim was sent to Banting Hospital using the emergency service assistance unit (EMRS) machinery. The victim is now reported to be in stable condition," he said. He said the firefighting operation ended completely at about 11.05 last night. This article was published on: Thursday, May 21, 2020 @ 4:08 PM However, cases involving fire can be dealt with immediately if a device that is innovative and has its own uniqueness is fully created to reduce the growing number of cases in Malaysia. So, the device in question is the Hybrid Portable Stove. Of course, many still do not know or do not understand what a Hybrid Portable Stove is, right? We have also asked this question to many of

our friends and the answer we have always received is that it is a material that uses batteries and electricity. What is certain is that the Hybrid Portable Stove is a cooking place that uses battery energy and is assisted by a shared electric motor. Therefore, we decided to make this new material as a solution to all the problems that are often faced by all communities caused by flammable materials as well as family lives. It can also provide a good effective rate for daily use.

1.2 PROBLEM STATEMENT

There are some problems faced by some people towards cooking materials such as gas cans that are also often used in daily life. Among them are in terms of size and weight. If we want to know, in Malaysia not all groups can lift heavy barrels here and there like the group of elderly people who are powerless to lift the object and if it is forced these groups will suffer from pain in the knees, spine and spasms. This is because the energy used is quite large and can result in death if the wrong steps. There is a 68.7% rate of emergency cases involving the elderly fractures due to lifting heavy loads. Also, this gas barrel is difficult to carry anywhere such as school groups such as camping and so on. This is because the barrel is heavy and difficult to hold due to its large size factor. In addition, the gas tank or cooking area can also fill too much space in the kitchen. This can result in a narrow space in the kitchen of our house and in terms of comfort it is less pleasant. This gas tank requires a lot of time to wait for a new gas tank to reach a house. This is because gas tank sellers are not always available, depending on the situation and stock available. Now we are also looking at cooking places that use electricity. This is because the rate of electricity consumption is higher than gas, and requires a lot of money. Furthermore, the increasing number of deaths due to fires involving gas barrels in our homes, is also a concern in all walks of life. This gas tank we as consumers will not realize the occurrence of fire due to this gas tank. Among the factors that cause the gas barrel to burn is to put fire accidentally to the gas tank and put the gas tank under accidental sunlight and our own negligence.

1.3 RESEARCH OBJECTIVES

The objectives to this research are:

- I. Design a kitchen that uses battery energy to replace gas consumption.
- II. Reduce the rate of fire cases in this country.
- III. Make the kitchen environmentally friendly so that it is always clean without air pollution
- IV. To analyze the capabilities of mobile kitchens in the community
- V. Test the capabilities of this Hybrid Portable Stove for long term use.

1.4 RESEARCH QUESTIONS

This study will answer the following research questions:

- I. Is the manufacture of Hybrid Portable Stove able to provide high quality and value for each user? • What types of materials can be used to make the Hybrid Portable Stove cheaper?
- II. What are the possibilities of making this Hybrid Portable Stove as a material that can compete with existing brands?
- III. Is this Hybrid Portable Stove able to provide the best for all sections of society?

1.5 SCOPE OF RESEARCH

The scopes and limits to this research are:

- I. Can reduce the rate of environmental pollution
- II. It is lightweight and easy to carry anywhere
- III. It cannot cook menus in large quantities because it is not suitable
- IV. High heating speed rate
- V. This product does not use gas cylinders
- VI. Does not cause injury to humans and animals
- VII. Small and easy to use
- VIII. Battery consumption

1.6 SIGNIFICANCE OF RESEARCH

However, the use of gas cylinders today is often used in all communities in this country and even in other countries for example. This is because people have been used to using gas cylinders since the 1910s, so it is no stranger to change This happens in the community. But the advantages of this Hybrid Portable Stove are much more effective than the gas canisters that can endanger all consumers in this country. Therefore, the findings of this study will bring many benefits to the public, especially the needy such as housewives , parents and those who do outdoor activities such as camping, fishing and recreation with family members and friends. Apart from that, with the Hybrid Portable Stove, it can contribute to Malaysian technology institutions and it really gives a positive impact and is also very useful to Malaysians.

1.7 DEFINITION OF OPERATIONAL TERMS

Hybrid: Simply put, it combines at least one electric motor with an engine to move the material, and the system recovers energy through regenerative brakes
Portable: Is a type of material that can be carried or transferred easily
Stove: A tool for cooking or heating

1.8 CHAPTER'S SUMMARY

In this chapter, the study has explained about the origin of the idea and the inspiration formed, as well as the objectives made from all the problem statements that are a factor of advantage of this Hybrid Portable Stove is made. In addition, the objective for this project is to focus the importance of Hybrid Portable Stove to a society that should exist in every family. It is able to compete farther than all the competitors who have preceded it before. With high trust from all communities in this Country it is able to continue to progress and be given deeper emphasis as well as a good impact for an invention or innovation that will be the talk of the town such as mothers and those who need it for their own pleasure.

CHAPTER 2

LITERATURE REVIEW

Prepared By : Muhammad Haikal Haziq Bin Zamri

2.1 Introduction

This chapter will be stating a lot about the literature review, which this project will go on much further into the details that had been provided since the first day the final year project 2 has been conducted earlier. The details such as any change to the concept that we previously stated before in our first final year project due to cost problems and other issues that had been a difficulty to conduct the project and partly this research. If we had not done this change then it would be a barrier to continuing this project, such change and adjustments to the original plan all in order to continue the research either succeed or fail.

Such details pointed out to our project is the concept without changing the main concept. For example, adjusting or replacing some of the materials. We did change the concept of using a solar panel to a DC motor due to high cost. Other issues appeared but it will be part of our research to understand what's best for the product and this project to succeed. Since we had all the materials with us it would be easier for us to think of the hybrid concept such as the wiring concept. Then it would have been much easier for us to plan for the next task. Such planning and scope are necessary to ensure the process of this whole program to be in an orderly manner.

While gathering tools and plans for the next task, in our free times we studied the advantage of our project along with its research to ensure this project is worth conducting as it may be potential in the future of innovation and technology. Since our project involves people's daily lives. We intentionally made it so important to gain as much attention as we can. Though it might not succeed but the concept is there to be improvised and acknowledged for further conduct. This literature review would show more details of the project and its progress in becoming a product.

2.2 Introduction of Hybrid Portable Stove

As the world evolves today almost all depend on technology and most importantly to find a subsistence energy source that can stay and hold for long. The idea we came up for the final year project is indeed something that has a lot to do with the knowledge of electricity and thermal energy. That is why we have come up with the name of our product Hybrid Portable Stove which uses the application of electrical power sources. To sustain such performance to our product many types of concepts we had thought and planned all the way. From the application of Solar source to the application of dynamo power source or could say DC motor.

Before we ever continue to ever move forward to build this product, we had done several surveys to the public to understand the motive they want if we were to create this product. Based on this survey we decided the product can be used in all places and environment either indoors or outdoors. This product can be bought anywhere because it is easy to be accessible because it doesn't involve complex wiring and set up. All it takes is to carry it anywhere. That is one of the concepts we come up with. We believe the less complex or complicated it is, the more it is suitable to be used by all. So, the buyers do not require such skills to use the stove. It is our intention to come up with the idea. The Hybrid Portable Stove is important because we knew that a cooking place is limited and needs to be set up before it could be used. Though our product has its weakness or disadvantage, we made sure its concept is advantageous and can cover up the limits and disadvantages or normal stoves. What we can understand from this introduction is how the Hybrid Portable Stove is supposed to be simple and not complex or complicated to other stove products. Cooking material is important because it deals with daily life activities and fills up the people's needs.

Prepared By : Joelorence Birig

2.3 Characteristics of Hybrid Portable Stove

2.3.1 Advantages of Hybrid Portable Stove

Hybrid Portable Stove was meant to cover up a lot of disadvantages over the stove we have indoors and outdoors. By means that it would have a lot of benefits to it. The Hybrid portable stove can have to fill up a little more space than an average stove does. This would help save up more spaces and doesn't leave a messy trail which will burden people to clean it all over. Hybrid Portable Stove is also based on the low budget creativity and innovation that doesn't require that much cost or expenses. This would help individuals to organize their financial state if things were going a bit low. We believe the much simpler and less cost needed to create a product the much better it would be to sell and advertise to the customers. Though our product consists of a lot of electrical equipment, the equipment isn't too complex and could be found anywhere. All it takes is connecting and placing all the tools needed for this product.

In this part, more details of providing information of the product will be informed. From the application of tools and equipment required to continue such effort. Though with such advantages existing for this project we also concluded some disadvantages which we recognised. This disadvantage is not a weakness but an understanding of any improvement that is recommended. In every method that is possible, there will always be some problems and issues that follow. What is important we are able to extract as many advantages from the whole effort done for this project and the invention of this product. The product is a genuine idea that was chosen and agreed by my team which makes the project a green light to explore wider aspects of knowledge. By the research conducted by every one of us, the most suitable way of putting it all together is that we were able to understand the basic application of electrical energy and thermal power.

2.3.2 Advantages of equipment and tools used



Figure 2.3.2.1 – Drilling

Most of the tools and equipment used as we can see from above are from home appliances. No heavy tools or advanced one were used because it was all provided by me. The tools we mostly use are already owned and can be considered as basics to all houses, these tools are mostly used for example a drill to drill holes at the walls for pictures to stand. From the picture above we were able to use it to modify the toolbox bought from a local store. This explains how such basics tools and equipment can be useful to invent such things and does not require a special skill and much more advanced machinery.



Figure 2.3.2.2 - Miser

Basic toolbox tools were used a lot to continue the efforts of modifying the tool box so we were able to insert other materials in it and connect them as planned supposedly to ensure it fits well to what we predicted as intentionally. As we can see from the above, I used the scribe to enlarge the

area where we would place the switch that will connect the electrical current which will flow inside the toolbox.



Figure 2.3.2.3 – Wire (Material)

As we can see from above, most of our materials come from local stores and don't require much time and other expenses to get the materials. Most online materials can be expensive due to shortage and shipping expenses so most of the items we have comes from local stores. Like wires from Tools shop and battery(motor) from a local workshop. Though with such prices, the owner does give some discounts knowing what we're doing. One of the advantages of getting items from locals is that it is fast and can offer some great deals that can save us with our budget.

Local stores are usually not that far since it would only take a few couple minutes to reach. The area I live, and study in is located on industrial platforms all around. Making it easier to find the materials we need especially when it comes to electrical tools and other materials needed. This would have been a great opportunity for us to continue the effort on the whole scope of the project.

Direct interference with the store owner means that we were able to bargain offers to buy the materials needed to an agreeable price that saves our budget which we already planned. If most of our tools we bought are from online then the price offer could not be interfered because prices on the internet are fixed for customers. Prices online are concluded by the shipping as well which cost some extra expenses. Especially if the materials we needed are overseas.

2.3.3 Advantage of method use for project



Figure 2.3.3.1 - wiring

One of the benefits we can get from this project, especially the method we used to build the product is that we understand such small devices can be applied to a material or a place we want it to be placed with the right modification and planning. The modification and planning consist of measurement and estimation all written down to decide which part and placement it must be.



Figure 2.3.3.2 – wiring concept

Simple wiring was one of the concepts we came up with the connection placement in the toolbox. Further explanation will be on the next subtopic which will go in more detail of the Hybrid concept we use. Since hybrid is an application of power source to overrun a certain work on equipment or

tool. Since this product depends most of its power on a battery which makes it essential to have a proper hybrid concept

2.3.4 Disadvantage of method use

Though our materials needed for the product are from local stores and workshops the expenses are also high since we depend on them thoroughly. Our method involves a lot of bought items since recycled items are not available for the type of product we invent.

Some of those disadvantages of relying on this type of method is lack of extra tools and expertise highly required for circuiting or wiring. Our method consists of basic knowledge and intel from the website of google scholar as recommended by our supervisor. The website is helpful to give such important details but yet without any supervision or observation from skilled trained people it will not only cost us money but also time which made us delay a few couple days or week until we could get a hold of a better plan and decision.

Each one of the team members would perform to gather all intel and research as possible to be discussed. Even if we were able to continue the research and project, it would almost cost us more time due to some knowledge we unseen and had to be understood first before we proceed any further task unto the product we are inventing. All in the matter of avoiding such waste and loss of budget.

Prepared By : Muhammad Hafiz Zulfaqar Bin Badrol Hisham

2.4 Hybrid Concept

Process



Figure 2.4.1 –dc motor and dynamo

Dc motor and dynamo are connected together using coupling on a board . Dc motor function to turn the dynamo and the dynamo will convert the kinetic energy to electrical energy and thus to recharge the battery. Why do we call it a hybrid process ? .It is because we have two energy powers to supply for this project ,first is a battery that supplies the current to the DC motor and heat element and second is from dynamo that will supply the current for the battery.



Figure 2.4.2 – Base of heat element

Make a base of heat element using plaster of Paris.Carving the surface of the stove and making it look like the design that we want.Shape the heat element and make it look like the design that we carve on the surface of the stove.



Figure 2.4.3 – Connection of all component

Arrange each component into a toolbox .make a wire connection from the battery to the switch and from the switch to the hot element and then to the battery again.Connect the dc motor to the dynamo on one material.make a wire connection from the battery to the switch, from the switch to the dc motor and then to the battery again.connect the wire from the dynamo to the battery to recharge the battery.

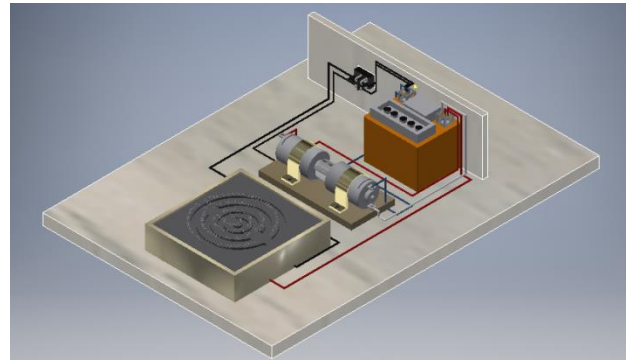
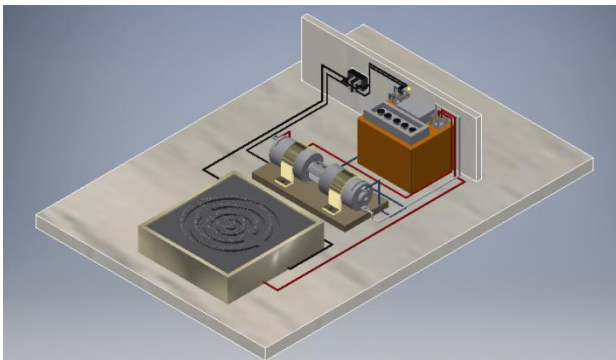


Figure 2.4.4 circuit

Consist of arrangement of battery motor, Dc motor and heating element stove. The wires are managed according to the flow of current so that it can transmit the charges without having the flow of the current to go in both directions forward and backwards. We ensured the flow of current as in one flow and no other flows by using a capacitor

CHAPTER 3

METHODOLOGY

Prepared By Muhammad Hafiz Zulfaqar Bin Badrol Hisham

3.1 INTRODUCTION

Methodology is related to the word method. In fact, a methodology is a system of methods followed consistently. Scientists, for example, use various methodologies as they perform experiments. It might seem like the world is nothing but chaos and disorder. But actually, sometimes there is a method to this madness. And sometimes there's a methodology.

In this chapter, there will be a lot of information about the process and journey throughout the making of our final project. We will show how we make connections and for this project we use hybrid methods. Why hybrid? .because our project has two sources of power, the first source is to heat our heat element and another two charge our main source . These methods we have do some research and it will be explained .

Also , will be shown the design and material that we choose in making a hybrid portable stove. In this project we choose the material that has enough resistance of heat and has enough source power. Also we make sure that our material is appropriate and strong enough to withstand the pressure. In the construction of our project we just buy the material that we need and combine it to make it our design, only our stove that we build based on our idea to reduce electricity consumption.

3.2 FLOW CHART

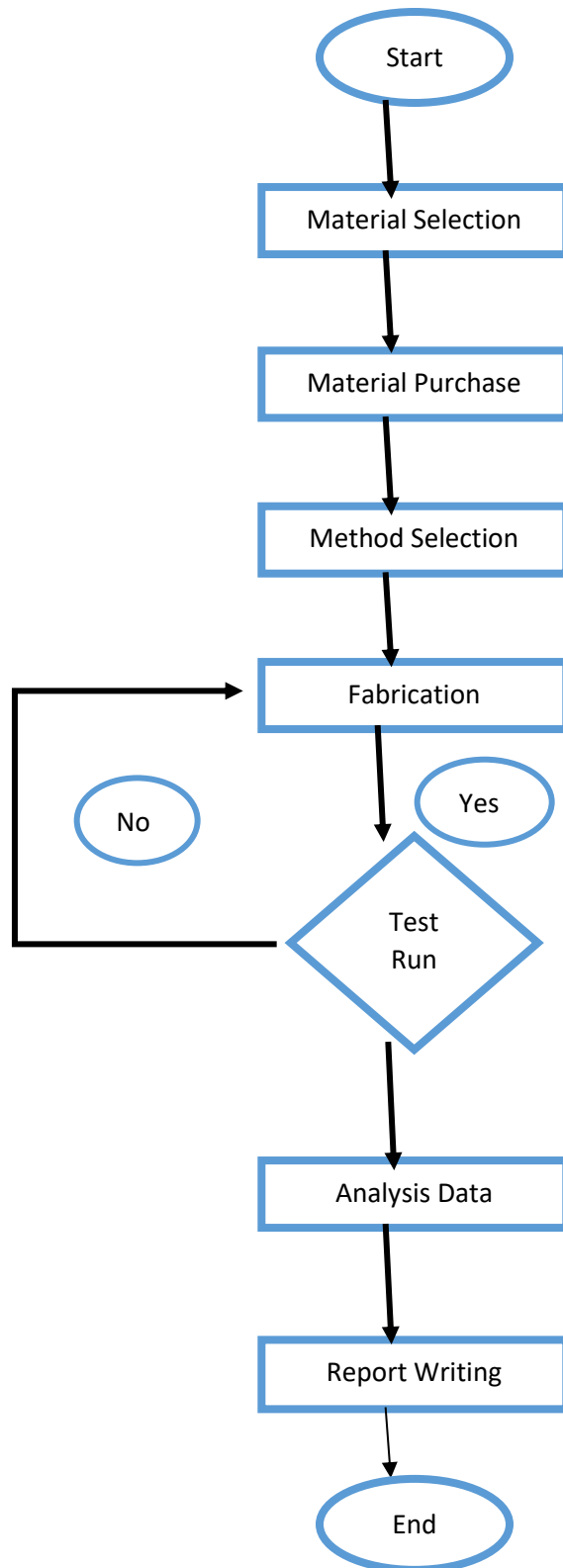


Figure 3.2.1 –Flow chart

3.3 FLOW CHART EXPLANATION

3.3.1 Detail sketching of the project design

1.Design sketch

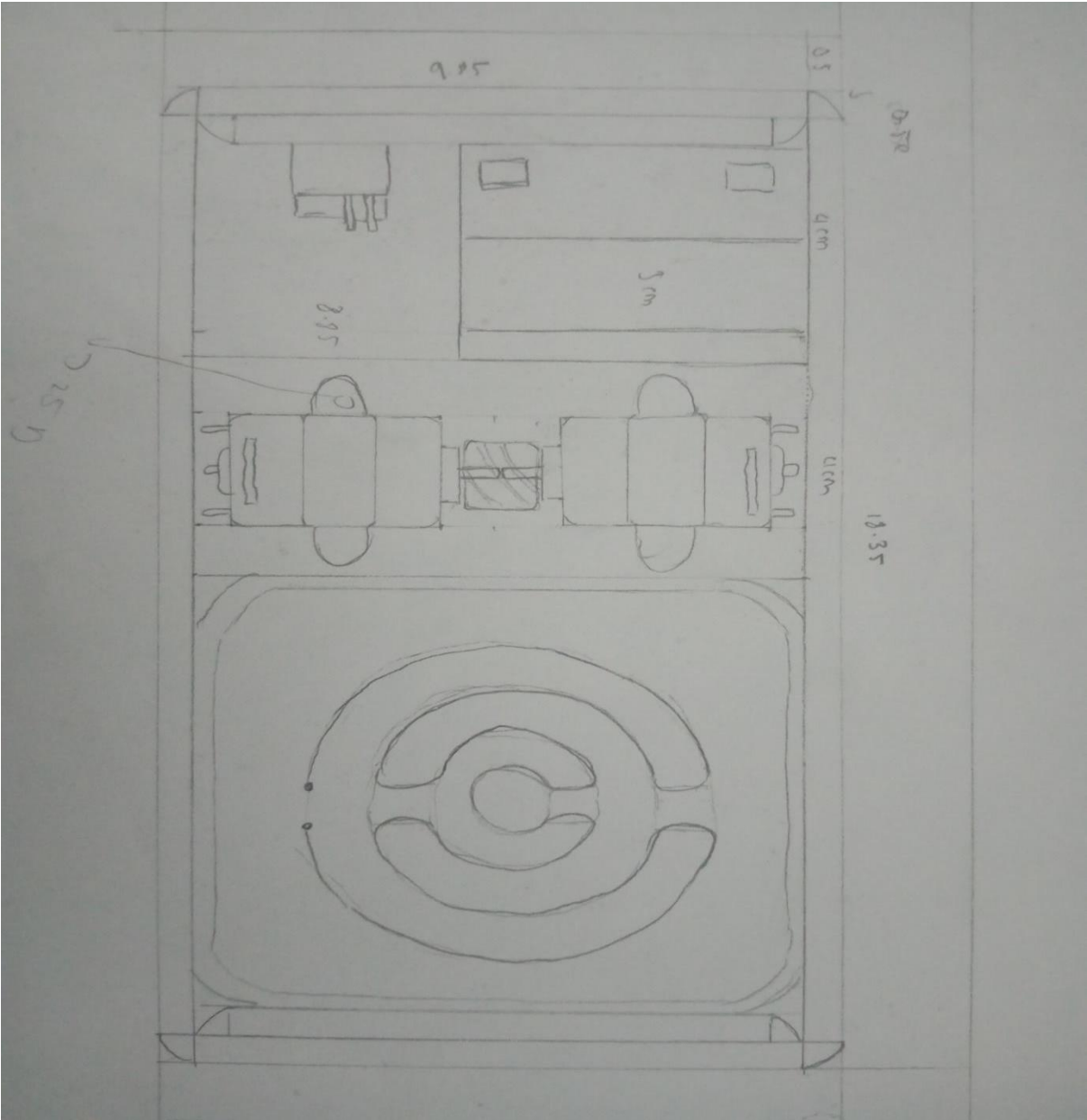
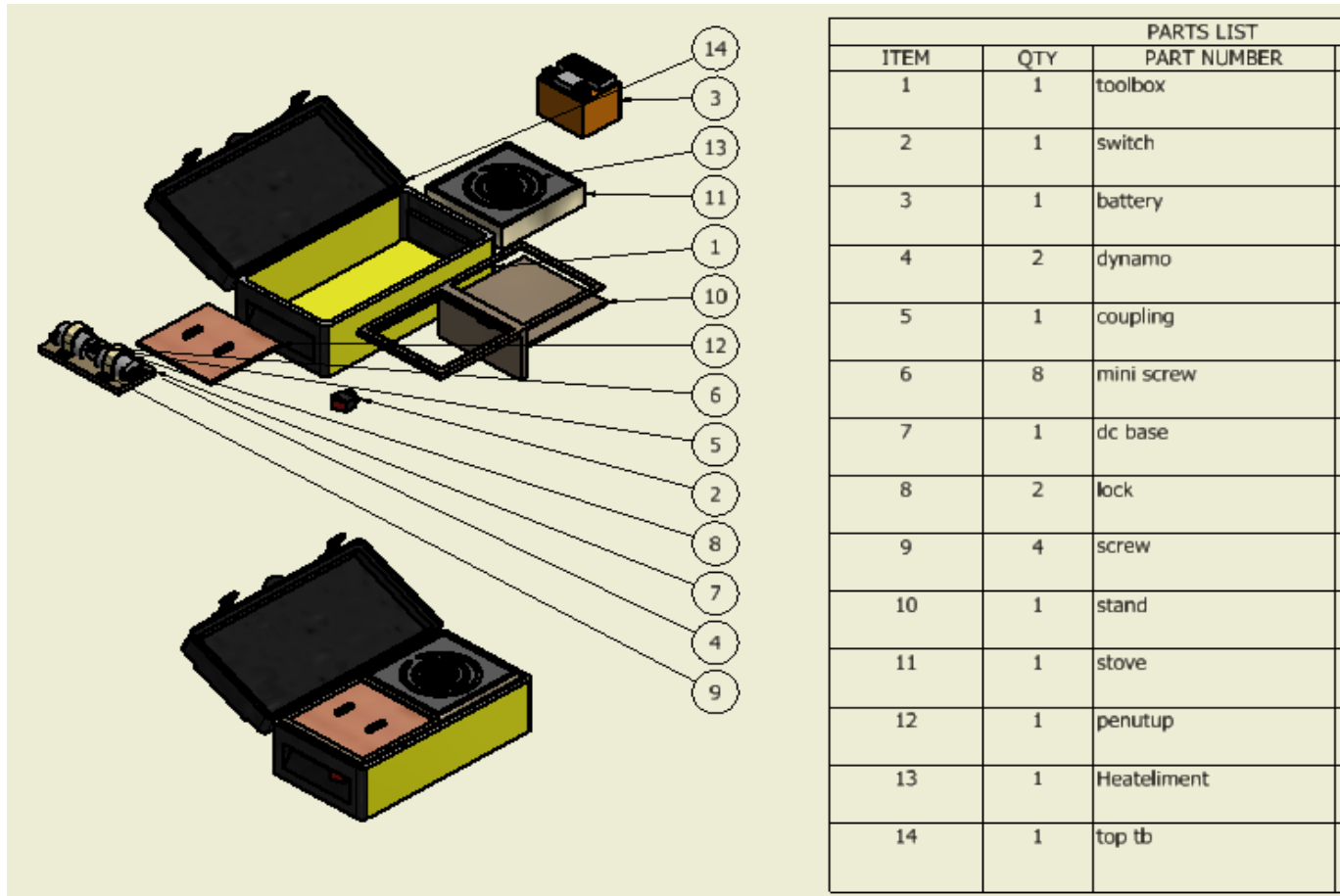


Figure 3.3.1.1 – design sketch

2. Autocad design



3.Circuit sketch

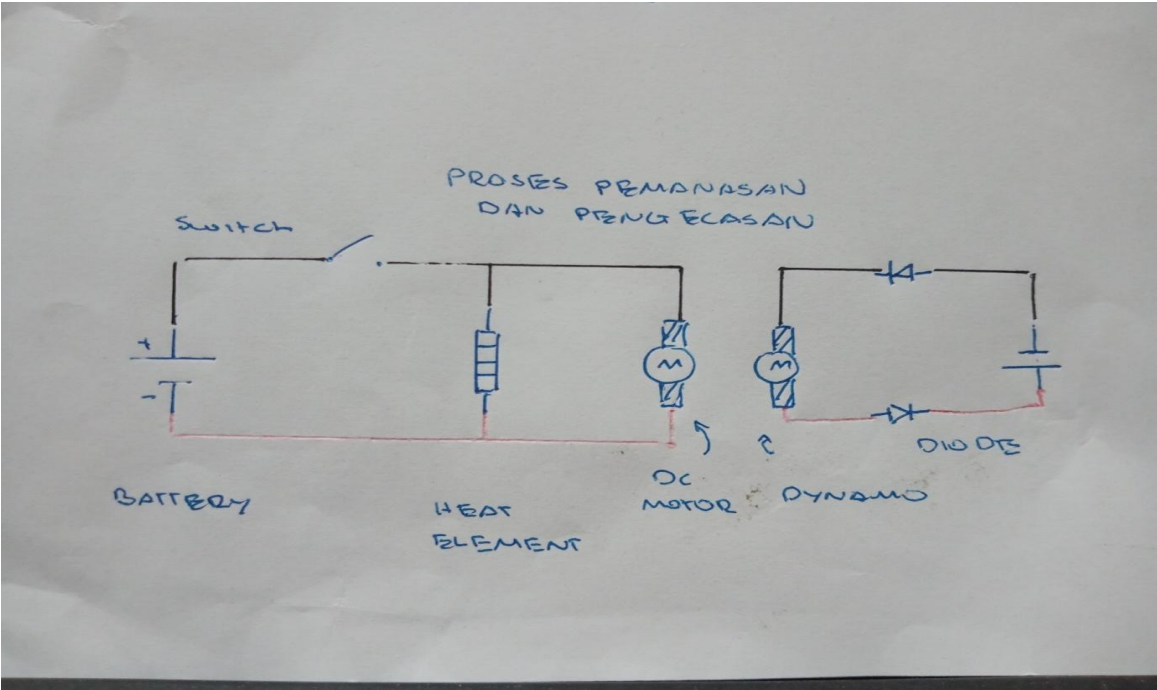
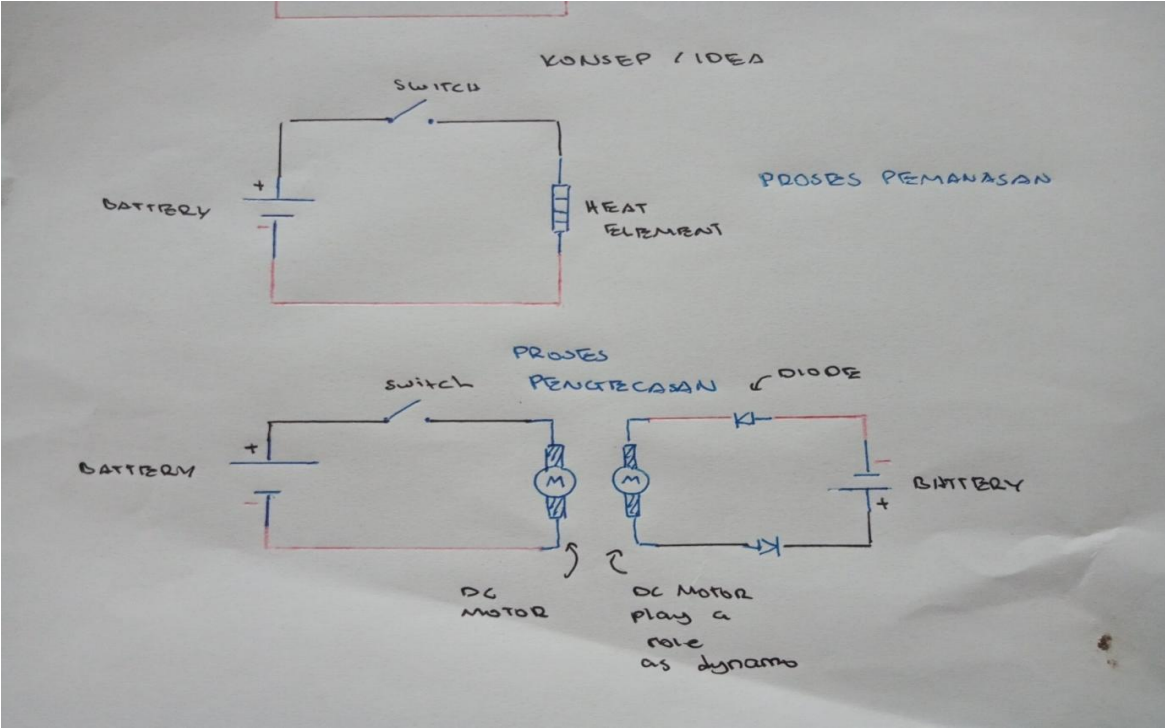


Figure 3.3.1.2 –Autocad design

4. Circuit autocad

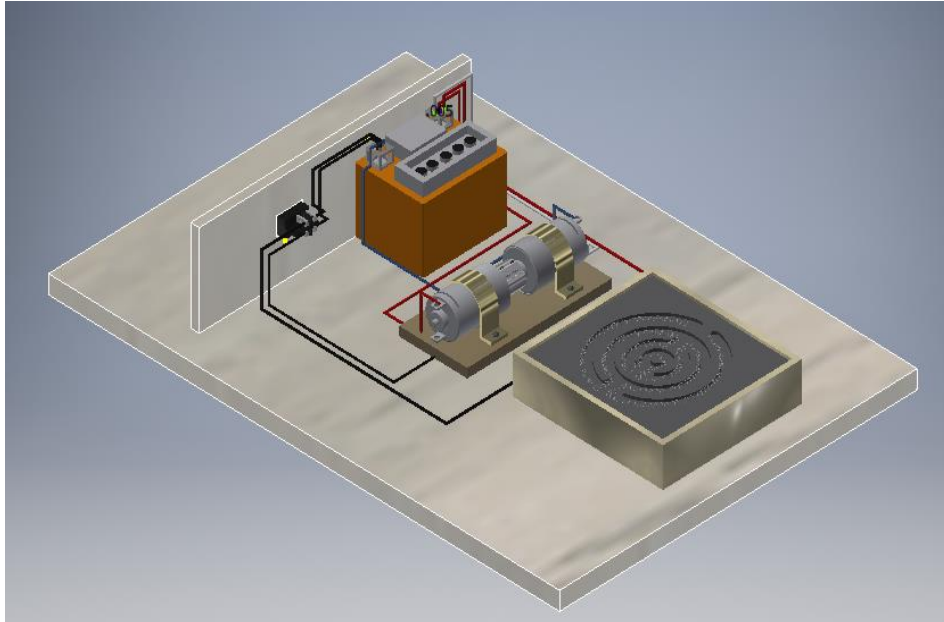


Figure 3.3.1.3 – Circuit sketch

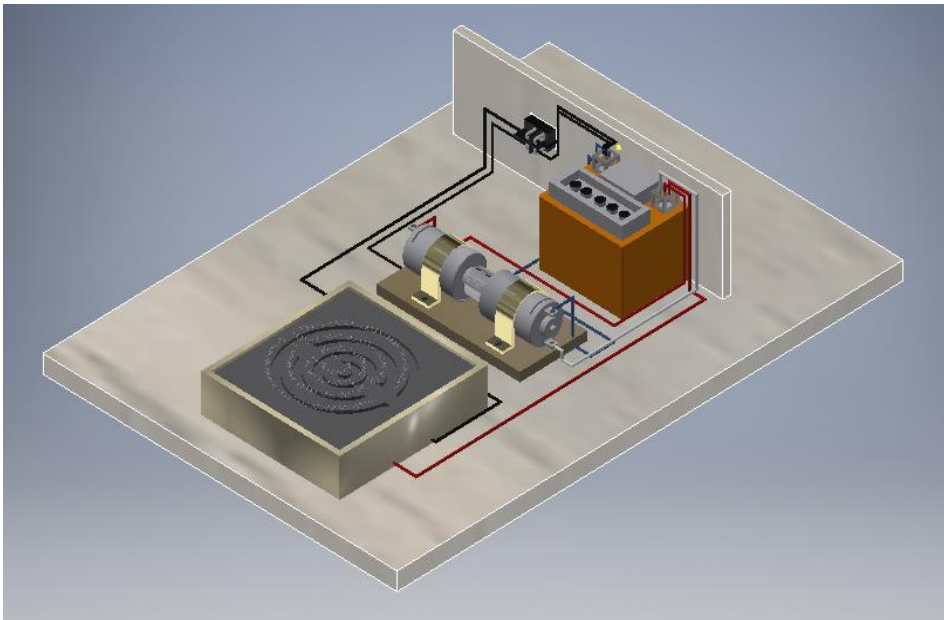


Figure 3.3.1.4 – Circuit autocad

3.3.2 Material selection

1. Battery

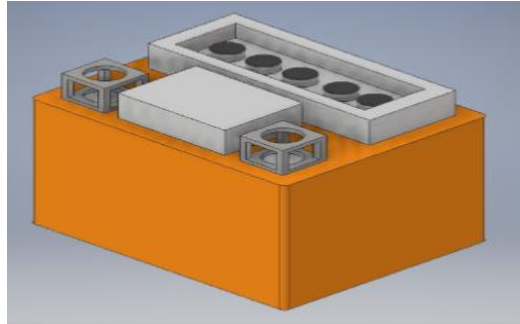


Figure 3.3.2.1 - Battery

A power supply for this project. Supply current to dc motor and heat element. Type- motorcycle battery. A battery is a device consisting of one or more electrochemical cells with external connections for powering electrical devices such as flashlights, mobile phones and electric cars. Battery also can convert from current to heat. When a battery is supplying electric power, its positive terminal is the cathode and its negative terminal is anode. In this project I need to find a battery that has enough power to supply and last longer. So, I choose a motorcycle battery because it has what I need. It can supply energy for our project and also can last longer.

2. Toolbox

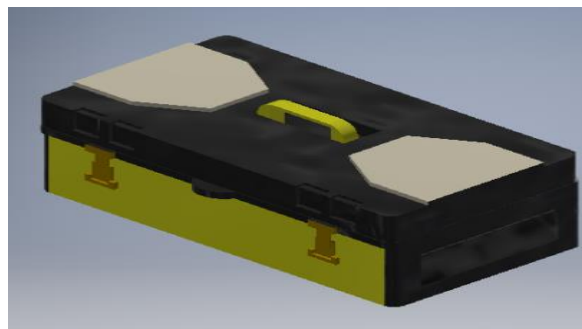


Figure 3.3.2.2 - Toolbox

As a base for our product. A toolbox, also called tool kit, tool chest or work box. Is a box to organize, care for or protect the owner's tools. they could be used for that. Early in mankind, people would find objects that they could use to do other things, Portable tool boxes were typically made from wood, steel and plastic. Steel toolboxes are known to be stronger, withstand abuse, and support the weight of many tools. But for our project we surely want a toolbox made by plastic because it decreases the weight of our product. And also, for this project we just buy a toolbox that already has and just modify it to make it as our product.

3. Stove

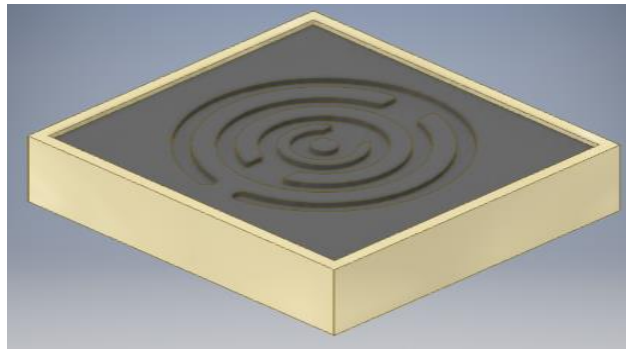


Figure 3.3.2.3 - Stove

Stove made by plaster of paris and aluminium. As a base for heat element. Aluminium is a silvery-white, lightweight metal. It is soft and malleable. Aluminium is used in a huge variety of products including cans, foils, kitchen utensils. This is because of its particular properties. Plaster is a smooth paste made of sand, lime, and water which goes hard when it dries, plaster is used to cover walls and is also used to make sculptures. Plaster is a building material used for the protective and decorative coating. The earliest plaster known to us were lime based around 2500 BC, the people of 'Ain Ghazal in Jordan used limestone to make unheated crushed limestone to make plaster which was used on a large scale for covering walls, floors. Suitable for our project because it is heat proof.

4.Heat element

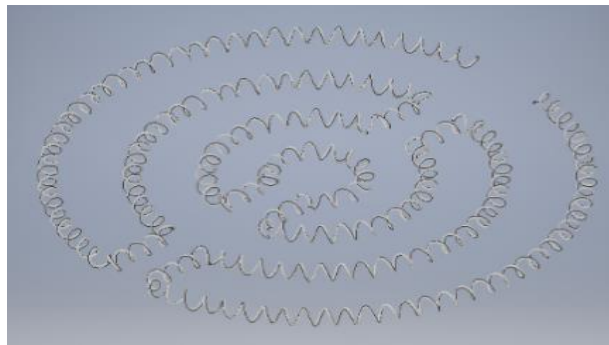


Figure 3.3.2.4 –Heat element

A typical heating element is usually a coil, ribbon or strip of wire the gives off heat much likes a lamp filament when an electric current flow through it.It glows red hot and converts the electrical energy passing through it into heat, which it radiates out all in directors

5. DC motor and Dynamo

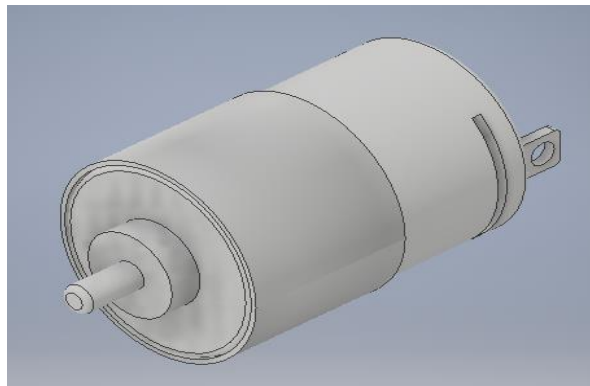


Figure 3.3.2.5 – DC motor and Dynamo

This thing can have two functions either dc motor or dynamoDc motor work when you connect the power supply to it and it will rotateA DC motor is any of a class of rotary electrical motors that converts direct current electrical energy into mechanical energy. A DC motor's speed can be controlled over a wide range, using either a variable supply

voltage or by changing the strength of current in its field windings. Dynamo function when you rotate manually and it will generate current. Dynamos and Generators convert mechanical rotation into electric power. Dynamo - a device that makes direct current electric power using electromagnetism. It is also known as a generator, however the term generator normally refers to an "alternator" which creates alternating current power.

6. Coupling

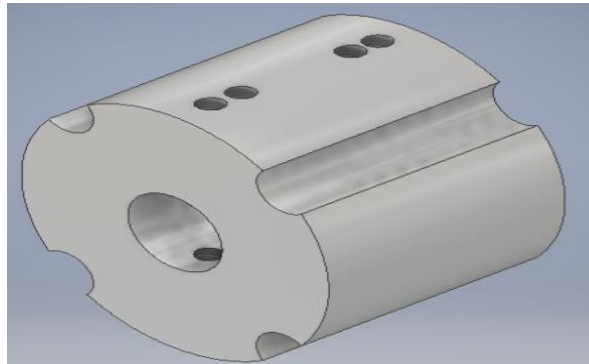


Figure 3.3.2.6 - Coupling

A coupling is a device used to connect two shafts together at their ends for the purpose of transmitting power. The primary purpose of couplings is to join two pieces of rotating equipment while permitting some degree of misalignment or end movement or both

7. Wire



Figure 3.3.2.7 - Wire

A wire is a single usually cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunications signals. Wire is commonly

formed by drawing the metal through a hole in a die or draw plate. Wire gauges come in various standard sizes, as expressed in terms of a gauge number. The term 'wire' is also used more loosely to refer to a bundle of such strands, as in "multi strand wire", which is more correctly termed a wire rope in mechanics, or a cable in electricity. Wire comes in solid core, stranded, or braided forms. Although usually circular in cross-section, wire can be made in square, hexagonal, flattened rectangular, or other cross-sections, either for decorative purposes, or for technical purposes such as high-efficiency voice coils in loudspeakers. Edge-wound coil springs, such as the Slinky toy, are made of special flattened wire. We use this wire to connect the components that use electricity and we use as many as 3 meters of wire which is 1.5 meters of black wire and 1.5 meters of red wire.

8. Stand and cover

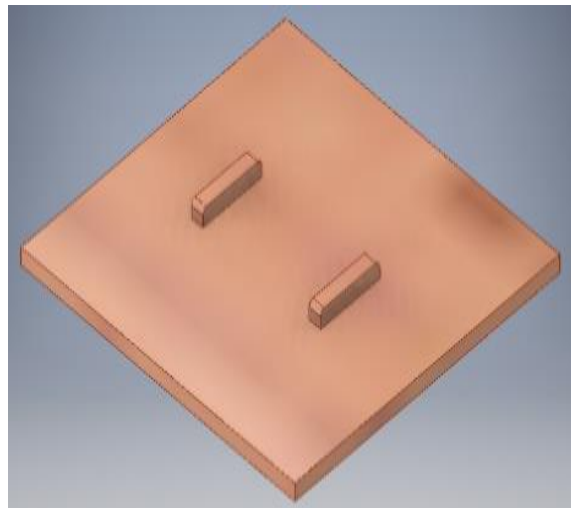
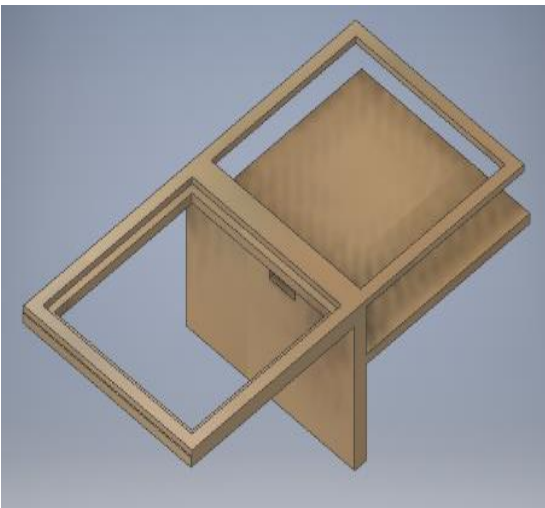


Figure 3.3.2.8 – Stand and cover

It use to cover up all components In toolbox.And also to accommodate the stove.Made of plywood. Plywood is a material manufactured from thin layers or "plies" of wood veneer that are glued together with adjacent layers having their wood grain rotated up to 90 degrees to one another.All plywoods bind resin and wood fibre sheets (cellulose cells are long, strong and thin) to form a composite material.

9.Diode



Figure 3.3.2.9 - Diode

A diode is a semiconductor device that essentially acts as a one-way switch for current. It allows current to flow easily in one direction, but severely restricts current from flowing in the opposite direction.

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3.3.3 Material purchase

For the purchase of goods we buy in two places, namely in hardware and online purchase in shoppe or lazada.

The item we buy at the hardware

1. Toolbox
2. Wire
3. Aluminium
4. Battery
5. Plywood

The item we buy online

1. Plaster of paris
2. Heat element
3. Dc motor
4. Dynamo
5. Coupling

Before we buy the materials, we need to do some research on the price and also the benefits of the materials we buy. We do this to save money and avoid wastage while getting good stuff.

3.3.4 Fabrication and attachment of all parts

FABRICATION

- I. Motorcycle batteries are used to supply current to the heat element and dc motor.
- II. Heat element is used to produce heat for cooking
- III. Dc motor are used to move/make a rotation for dynamo
- IV. Dynamo is function to supply current to battery (charge)
- V. Function of a diode is to allow an electric current to pass in one direction
- VI. Our stove made by plaster of paris to withstand heat

ATTACHMENT OF ALL PARTS

OPERATIONAL

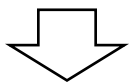
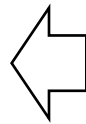
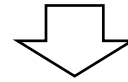


Figure 3.3.4.1 – Operational methodology

- I. We made our base for the heat element using plaster of paris. We use aluminium for the base of plaster of paris and then we mix plaster with water approximately a 1:1 ratio .In other words, half of plaster and half of water.
- II. Next, we dried the mixture that had been made earlier under the sun for an hour to make it hard.
- III. After the mixture is hard, we carve the base of the heat element to a suitable shape to place the heat element. And then we form the heat element according to the carving engraved on the base
- IV. Next we drilled a hole in the side of the toolbox to place the switch.
- V. The switch is placed in the hole that was made earlier
- VI. Dc motor and dynamo are placed face to face on a board because dc motor aims to turn the dynamo to convert kinetic energy to electrical energy and the electricity generated by the dynamo will be channeled to the battery for battery charging process



Figure 3.3.4.2 - Arrangement

Then each component is arranged according to the design sketch from 3.3.1

WIRE CONNECTION



Figure 3.3.4.3 – Circuit

For this wire connection we use series circuits for heating process as well as charging process. The wire connection starts from the battery directly to the switch and this switch has two slots and the slot to divide the electrical energy transmission to the dc motor and also the heat element. For the first switch slot will be channeled to the heat element to be heated, and this heat element is the source of heating for this project. For the second switch slot is connected to the dc motor, after the electric current flows to the dc motor it will turn the dynamo so that the dynamo can convert kinetic energy to electricity to be channeled back to the battery. The diode is connected between the dynamo and the battery so that the electric current flows in one direction.

Prepared By : Joelorence Birig

3.3.5 Refining and final touch of project

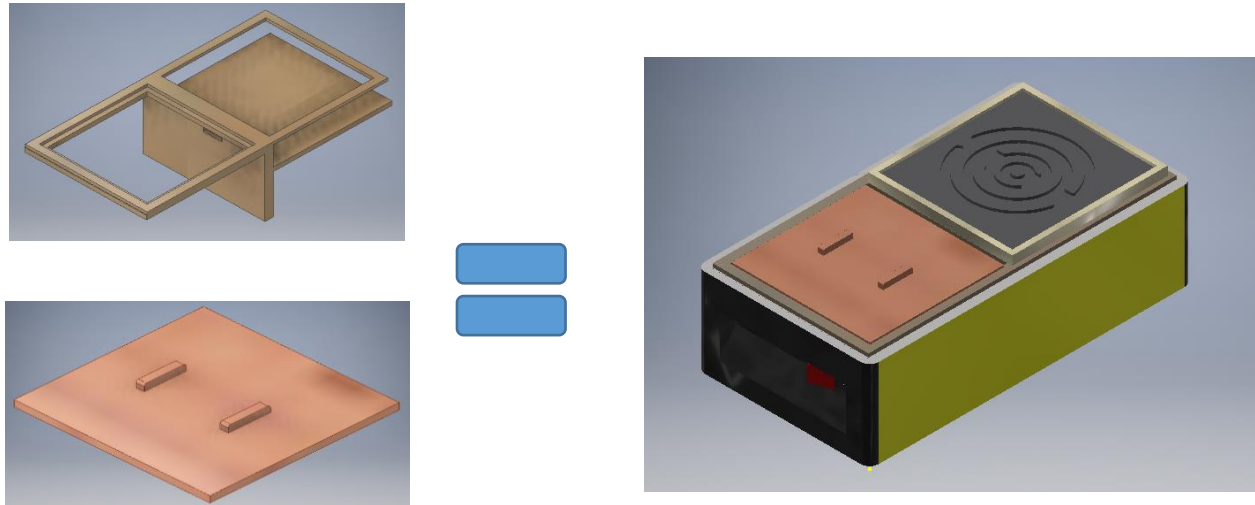


Figure 3.3.5.1 – Final touch

For the final touch we made a place to put the stove using plywood. the purpose is to elevate the position of the stove after that we also make a cover using plywood and the purpose is to cover all the components that are in the toolbox

3.3.6 Product testing

We did a test on our project and we found that initially we needed to increase the voltage, so we discussed adding a transformer component to convert ac to dc but the transformer we bought failed and we looked for other ideas or ways to achieve the level we need. so for the last test we have shortened the heat element wire to reduce the resistance slightly to turn on the heat element.

The test we did was to heat the water in the pot and the water boiled. so that is the beginning of this test. After that we tested how long it could last and we found that this project needed some improvement so that it could work properly.

3.4 PROJECT ACTIVITY

Project activity / week	1	2	3	4	5	6	7	8	9	10	11	12	13
Material purchase													
Project planning /discussion													
Project design													
Method selection													
Fabrication													
PITEX preparation													
Video and slide													
Product testing													
Analysis													
Final touch													
Report													

Table 3.4.1 – Project activity

3.5 Budget calculation

No.	Materials / Equipment	Price (RM)	Quantity	Total(RM)
1	Plaster of Paris	5.00	1	5.00
2	Aluminium	2.00	1	2.00
3	Toolbox	50.00	1	50.00
4	Battery	50.00	1	50.00
5	Dc Motor	25.00	1	25.00
6	Dynamo	25.00	1	25.00
7	Diode	2.00	2	2.00
8	Wire 1.5 Black and 1.5 Red	1.50 /mm	3mm	4.50
9	Heat Element	5.00	1	5.00
10	Coupling	6.00	1	6.00
11	Plywood	10.00	1	10.00
12	Switch	1.5	1	1.50
13	Connector	2.00	2	2.00
	TOTAL AMOUNT BUDGET			188.00

Table 3.5.1 – Budget calculation

3.6 SUMMARY

Briefly for this chapter describes every step we take to complete this project. So what is in this chapter is, how do we design, and choose the right materials in making this project. For this chapter we also show how we make the connection of each component. In conclusion, in implementing this project we have made a study on how to save costs to obtain quality goods in the success of this project

CHAPTER 4

FINDINGS AND ANALYSIS

Prepared By : Joelorence Birig

4.0 INTRODUCTION

In this chapter we have combined data and analysis on the Hybrid Portbale Stove and its material calculations. This data and analysis is very important for each material or project to achieve the objectives and scope of the project well and thoroughly. This data also shows the results of material testing that has been successfully done. In addition, after obtaining all these data, we have analyzed every possibility to make it perfect so that it can be used in the long term and effectively.

4.1 ADVANTAGE AND DISADVANTAGE

Every material, item or project created specifically for human use will definitely have its own advantages and disadvantages. This explains that every benefit obtained in all materials created can help solve problems that are often faced by all walks of life in Malaysia, especially the however. The disadvantages of each material or project will certainly arise in terms of its capabilities and life span for the material or project itself. This should not be underestimated in the disadvantages that arise and we will strive to improve and also improve each disadvantage available so that it can be used as a material or project that is useful and beneficial for all general layers. Hybrid Portable Stove is a material or project specially created to reduce the rate of fire cases in this country and can have a positive impact in terms of its use to the public. Besides that ju No, it is a material that can be taken anywhere because of its relatively small size compared to its previous competitors. In addition to the advantages, this project can also be detrimental and

disadvantages will arise at any time according to the method of use and time. But with disadvantages this is what we will do our best in correcting mistakes and disadvantages so that it can be used as an innovative and creative model in the future.

4.2 DATA

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In our problem statement there are questions highlighted or important to be interviewed to the people. A survey has been conducted and shared to anyone. the survey is based on Google form or Google survey

<https://docs.google.com/forms/d/13EgzvVtiVND4nNvwJoR23e1Uj1oZACnfEZ3Nx4mWWgl/edit#responses>

The following are data collected from our survey: -

Do you have any difficulties to bring you cooker(stove) to anywhere for outdoors activities? (Adakah anda merasa beban untuk membawa pemasak kemana mana di luar rumah?)

20 responses

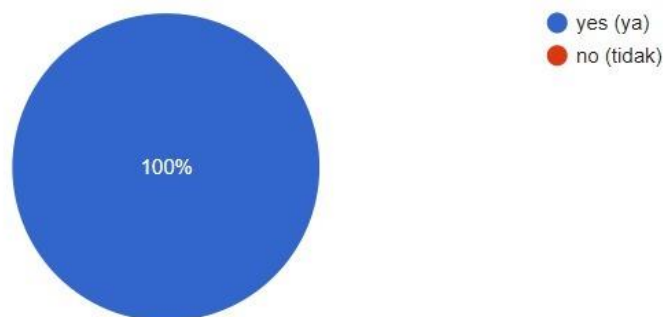


Figure 4.2.1 – Difficulties to bring cooker outside

From the above data, it discusses if it would be difficult to bring a stove outside and 100% stated yes. This proves more that it is quite convincing to come up with this idea for the project in the first place, since this hybrid portable stove would be much easier to handle than the ones we have now.

Do you often go outdoors especially with families, friends for any events involving picnic or cooking? (Adakah anda selalu meluangkan masa bersama keluarga atau rakan diluar rumah yang melibatkan aktiviti memasak?)

20 responses

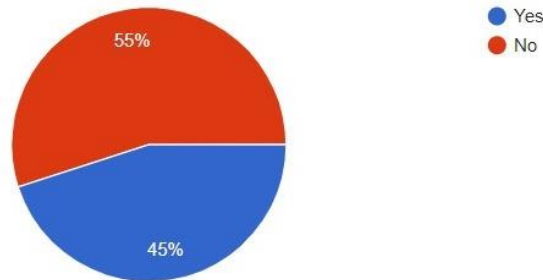


Figure 4.2.2 - Picnic

Though the majority who does not often go out in this case, but the chances are still high and not too much difference with the majority whom vote for no. The chances are that most of the time spent for the hybrid portable stove, does not just mean to spend it outdoors.

By this mean, our project could be use anywhere as long there is a place that has sunlight for the solar panel to charge the battery.

This data is whole optional and will not be an important one. But rather an extra back up for our project

Is it a burden to buy a gas tank to replace the other empty gas tank? (Adakah Ia membebankan anda jika ingin membeli tanki gas baru untuk gantikan tanki gas kosong anda?)

20 responses

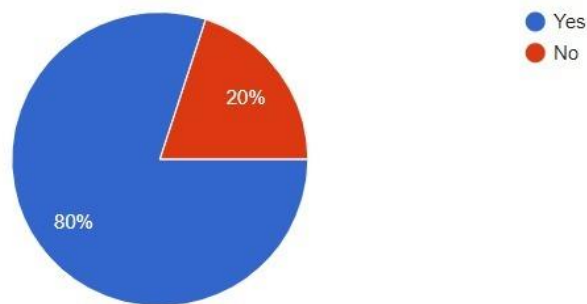


Figure 4.2.3 - Burden

Since the above data has shown the majority vote on yes, this means most do have difficulties on buying a new gas tank and replacing with another one. Many occasions do support this, because we do know that it costs money, and most people do want to save money.

Our project does not require replacement and extra charge, it is self preserved and easy to handle. Which in case of no need of replacement unless critical damage like breakage, damage and loss of components.

Does it take much time to wait for the gas tank to arrive in your homes? (Adakah ambil masa lama untuk menunggu tanki gas baru sampai di rumah anda?)

20 responses

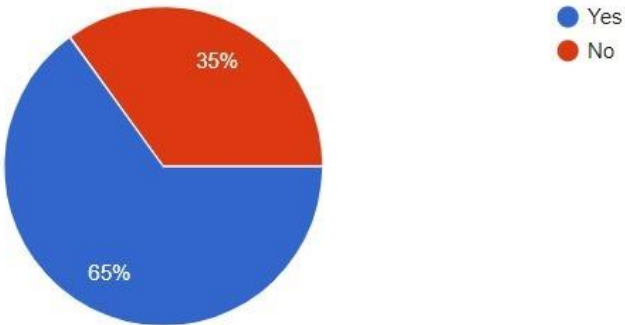


Figure 4.2.4 - Time

As part of the daily lives, it is normal for people who own gas tanks for cooking will need to call for a replacement if the gas is finished. People who lives in the city might have to wait for a long time for the gas lorry to arrive at their homes due to jams on the road.

Our project only requires the patience of charging it, but to be logical, we can always charge it during free times when not cooking. Cooking does not take too much time; it is the preparation to.

For heavy cooking might need more time but most people would

Prepared By : Muhammad Haikal Haziq Bin Zamri

if your cooker use electric energy, do you think it increases your bill amount highly? (Jika tempat memasak anda menggunakan tenaga eletrik adakah ia menambahkan jumlah bill anda dengan banyak?)

20 responses

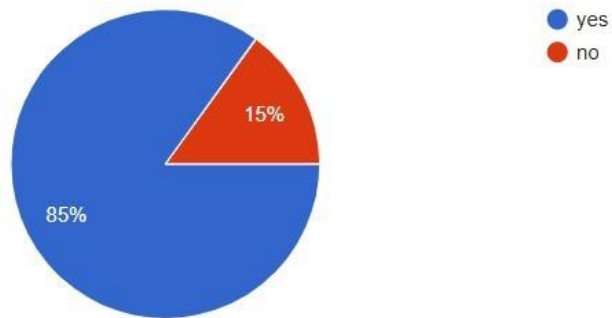


Figure 4.2.5 – Bill amount

Gradually, this question is important because it supports our objectives of money saving project. Mostly vote for yes that states that more bill amount will increase if stove uses electrical energy.

Is your cooking stove or place fills too much space in your kitchen? (Adakah tempat memasak anda memakan ruang di dapur anda?)

20 responses

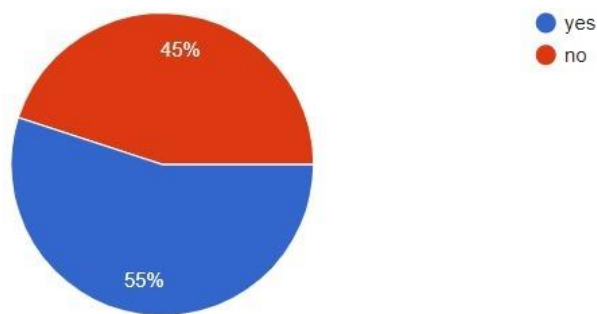


Figure 4.2.6 - Space

Some homes, especially people who live in the apartment, have less space than the ones living on ground. The idea of having a kitchen in an apartment might fill up some spaces due to gas tank fillings that will gradually take much more space.

By this means, we have gotten a majority that supports our project, which its idea is to lessen spaces that sometimes are too big.

By this method, would it save your money? (Dengan cara ini, adakah ia menjimatkan duit anda?)

20 responses

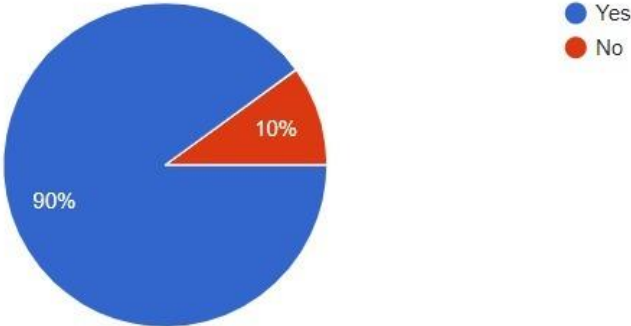


Figure 4.2.7- Money saving

Final question to form this data is would it save your money. Since it does not need replacement unless it is badly damaged due to accidents or unsafe use then there will be no extra costs. And this would save the money of the customers.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

In this chapter we will explain about discussion and conclusion for the project. Here we will discuss our effort to make this project work . Also this discussion is about how to improve this project as well as a discussion of the problems we are facing while doing this project.

5.2 DISCUSSION

Throughout the whole effort, we did the task or whole process one by one. In the means of analyzing each process we took to continue in getting the result. The benefit of this whole type of method we use, which is the application of performing various different test and building parts. Since most of our equipment was electrical equipment, it is necessary to try and error. Throughout the process many failures and some non functional tools to our current plans. We decided that if the result wasn't according to discussion and plan, then we decided to stick with the whole concept of this research. That we can always learn from it and change any necessary aspects of the project, ensuring we learn from any mistakes. Try and error is the best possible way of going through the whole process.

In this project we have discussed with our supervisor and our supervisor has commented on the improvement of our project, for example to add another charging system to help the battery recharge without having to activate Dynamo. So we took that opinion and talked to each other to make a component like a charger to recharge the battery. Apart from that, we are also discussing adding another battery to support the existing battery. We are also discussing putting a place for the 9v battery to activate the dc motor to turn the dynamo to recharge electricity without using the main battery. In addition, we are also discussing adding internal components to increase the volt so that the electric current received by the heat element is more abundant and the heating process occurs faster. In this project we also want to add a component to control the flow of electric current

to control the current delivered to the heat element, so the tool is used so that we can control the temperature for cooking.

Various problems we face in completing this project. Among the problems is the insufficient volt current in heating the heat element. Apart from that, we also had problems with the short circuit above because we made a mistake in connecting the circuit. . Due to that we had a discussion back in the second week, in that discussion we changed our charging process using dynamo and this system I have described in methodology. time and circumstances are also a problem for us in completing this project, each of us need to find a suitable time to meet in one place, because we do not have much free time, we discuss to do this project only 2 times a week. This demonic situation also caused us to not be able to meet because of the government order that ordered each of them to sit and work at home. Therefore, we took the opportunity to make a meeting in a particular channel so that the project to be implemented will run smoothly.

5.3 CONCLUSION

In conclusion, the project was formerly supposed to reduce gas usage for the stove and to save electrical energy used by the Electrical stove. Therefore, we used a hybrid method which involves the combination of two forms of energy to generate energy and flows into heat for the stove. After this discussion, we gathered some ideas on how to improvise or improve, so we design our project so that we can bring it elsewhere. Therefore, the product is invented for camping with families or friends, etc. Lastly, as we conducted this project's purpose is to reduce pollution caused by open fire from cooking either gas stoves or burning firewoods which release smoke into the air.

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