POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

DJJ 50193 PROJECT 2

REPORT:

EASY WRAP BOX MACHINE

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JABATAN KEJURUTERAAN MEKANIKAL

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Laporan ini dikemukakan kepada Jabatan Kejuruteraan Mekanikal sebagai memenuhi sebahagian syarat penganugerahan Diploma Kejuruteraan Mekanikal

JABATAN KEJURUTERAAN MEKANIKAL

SESI 1: 2021/2022

AKUAN KEASLIAN DAN HAK MILIK

EASY WRAP BOX MACHINE

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3. Saya bersetuju melepaskan pemilikan harta intelek 'Projek tersebut' kepada 'Politeknik tersebut' bagi memenuhi keperluan untuk penganugerahan **Diploma Kejuruteraan Mekanikal** kepada saya.

Diperbuat dan dengan sebenar-benarnya diakui oleh yang tersebut;

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sebagai Penyelia projek pada tarikh:

.....
(DR. SITI KHALIJAH BINTI JAMAL)

ACKNOWLEDGMENT

Alhamdulillah and thank Allah Almighty S.W.T. for giving me strength, knowledge, time, and opportunity to complete this final year project and endure and complete it satisfies. Without his blessing, there would be no such achievement.

I would like to take this opportunity to express my heartfelt thanks to my supervisor, Dr. Siti Khalijah Binti Jamal for his advice, guidance, and patience throughout the process project until we finish it.

ABSTRAK

Pandemik Covid 19 memberi kesan kepada pandangan global tentang perniagaan dalam talian, sekatan pergerakan dan prosedur operasi standard mengehadkan sifat perniagaan secara bersemuka. Perniagaan dalam talian yang terkemuka dan meningkat secara drastik. Perniagaan dalam talian mencapai pelanggan mereka dengan menghantar barangan dan produk mereka melalui perkhidmatan pos seperti Pos Laju, J&T Express, DHL Express, dll. Penjual dalam talian mengalami masalah besar, terutamanya dalam pembungkusan barangan pelanggan mereka. Jumlah pesanan yang tinggi memerlukan proses pembungkusan yang berkesan. Kekurangan kakitangan untuk membungkus bungkusan adalah masa dan memakan tenaga semasa membungkus adalah kritikal yang memerlukan perhatian. Objektif projek ini adalah untuk mereka bentuk, mengarang dan menguji Mesin Kotak Balutan Mudah untuk mencapai matlamatnya. Projek ini melibatkan mereka bentuk mesin pembungkus mudah untuk membantu perniagaan dalam talian. Projek ini melibatkan idea untuk membaiki pencengkam dan pembalut plastik benang boleh alih. Kaedah yang kami gunakan dalam proses pembalut adalah dengan menyambungkan tenaga daripada motor DC yang dikawal oleh suis. Selain itu, kami menggunakan beberapa teknik seperti proses kimpalan dan proses pendawaian untuk pembuatan mesin. Bagi mengenal pasti keberkesanan fungsi mesin pembalut, satu proses ujian telah dilakukan ke atas setiap komponen pada mesin yang gagal berfungsi dengan baik. Mesin Easy Wrap Box telah berjaya direka dan difabrikasi, ujian dilakukan terhadap keupayaan untuk membungkus satu kotak dengan saiz minimum 21cm dan maksimum 46cm dalam masa 2 hingga 4 minit bergantung kepada saiz kotak. Berbanding dengan pembalut manual, saiz kotak yang sama mengambil masa 5 hingga 7 minit. Manfaat Mesin Kotak Balut Mudah mengurangkan masa pembungkusan kepada 50%. Mesin Easy Wrap Box berpotensi untuk memasarkan sebagai penjual dalam talian melalui Shopee dan Lazada.

ABSTRACT

The pandemic Covid 19 impacts the global view on online business, movement restriction and standard operation procedure limit the face-to-face business nature. The online business leading and drastically increased. The online business reached their customer by courier their goods and product through post services such as Pos Laju, J&T Express, DHL Express, etc. The online seller experiences a major problem, especially in the packaging of their customers 'goods. High order volume demands an effective packaging process. Lacking staff to wrap the package is time and energy-consuming during wrapping are critical needs attention. The objectives of this project are to design, fabricate, and test the Easy Wrap Box Machine to achieve its aims. This project involved designing a simple wrapping machine to assist the online business. The project engaged with ideas to fix the gripper and moveable thread plastic wrapper. The method we use in the wrapping process is by connecting the energy from the DC motor controlled by a switch. In addition, we use several techniques such as the welding process and wiring process for the manufacture of the machine. To identify the effectiveness of the function of the wrapping machine, a testing process was performed on each component on the machine that failed to function properly. The Easy Wrap Box Machine was successfully designed and fabricated, testing was done on the capability to pack one box with a size of a minimum of 21cm and a maximum of 46cm in 2 to 4 minutes depending on the size of the box. In comparison to manual wrapping, the same size of the box takes 5 to 7 minutes. The benefit of the Easy Wrap Box Machine reduced packaging time to 50%. The Easy Wrap Box Machine has the potential to market as an online seller through Shopee and Lazada.

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CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

Packaging is one important element for some products that are marketed and guarantee the product's safety. The wrapping box method is one of the important elements in designing a production of a product. It is also describing the quality product & identity company that is producing the product. It is including how the product has been wrapped. The type of wrapping tape that is used in wrapping, the feature, and the specification of packaging. Progress of choosing the wrap's method must be the best to make the product is produced get rank in market and marketed well. The best way for wrapping packaging is the packaging that granted the customer's wish and can attract users to buy a product that is marketed.

There are a lot of appliances which are sold in the market to help for packaging boxes neatly and fast like Automatic Carton Sealing Machine. Automatic Carton Box Sealing Machine (carton sealer, case sealing machine) can do auto-folding for top lid ensures smooth and suitable sealing motions. The entire sealing operation is automatically performed, providing elegant outlook and labor-saving, the machine can be operated together with an automatic packaging line. The Automatic Carton Sealing Machine can be customized based on the carton size. This machine's price is expensive, the price is around RM3000 to RM8000. In the conclusion, the price is one burden for the seller who has a small business. Through our research, we discussed making a useful machine to make wrapping boxes easier. The machine that we make is using an electric motor system that can help to control the motion while wrapping progress. For the start, the switch is the more important to start the revolution gripper on the box to wrap the wrapping tape on the box that the user needs. We are sure that the machine that we build works well and is safe to use.

1.2 PROBLEM STATEMENT

According to current developments, the covid 19 pandemic has had a huge impact on us. We need to sit at home and always take care of our health. This is so, we have little trouble buying goods on the market openly. So, online shopping services should be of interest to us during this covid 19. As a result, online sellers experience a bit of a problem especially in the wrapping of their customers 'goods. Therefore, we created a wrapping machine that can help sellers to more easily wrap their customers 'goods neatly and safely.

Meanwhile, the problem faced by the online seller will arise when too many customers want to buy goods at the same time. This is because the seller needs to complete the package in large quantities immediately. This will cause the seller to use the services of staff to pack the boxes. Despite using the services of a large number of staff, the problem that will still arise among them is that it takes a long time to complete the wrapping process and the package is not neat. The Easy Wrap Box Machine can help traders because this machine can wrap the box quickly and neatly as well as reduce manpower.

In conclusion, the Easy Wrap Box Machine is very helpful and can solve business problems. Previously, traders experienced problems in the packaging process, but with this machine, all problems in the packaging process can be solved. Therefore, traders can wrap the box quickly and neatly. In short, we hope that the Easy Wrap Box created by us, can be on the market and can help all online businesses.

1.3 RESEARCH OBJECTIVES

The objectives of this research are:

i. To design a wrapping machine design that can do much better work than other machines for wrapping a box.
ii. To fabricate a wrapping machine that is easy to use and affordable.
iii. To test a function of a wrapping machine that can be used well.

1.4 RESEARCH QUESTIONS

i. Do you have used some products for wrapping a box neatly and quickly?
ii. Do you know someone who needs this product?
iii. Do you agree with the design of a box packaging machine that uses an electric motor system?

1.5 SCOPE OF RESEARCH

Easy Wrap Box Machine is specially designed to facilitate the packing of boxes in large quantities without the need for many staff.

The scopes and limits to this research are:

i. The Easy Wrap Box machine can wrap the box in 2 to 4 minutes depending on the size of the box.
ii. The length limit for the gripper box is a minimum of 21cm and a maximum of 46cm.
iii. This machine uses an electric motor system to rotate the gripper base of the surface of the box to be packed.
iv. Employ a switch with a speed controller that works to start and stop the rotation of the electric motor on the machine.

1.6 SIGNIFICANCE OF RESEARCH

In this topic, this research was explained about the wrapping machine generally. These objectives were concluded from all problems. This issue is a problem for online business owners who are having problems wrapping less neatly and taking a long duration. The issues and scope of this project will only pay more attention to the design of packaging machines, it helps those who want to pack boxes. Therefore, this simple packaging machine can be beneficial to sellers who pack goods using boxes because we intend to make it different from the existing machines in the market.

1.7 CHAPTER SUMMARY

In conclusion, the Easy Wrap Box Machine is related to the method of packing boxes using adhesive tape. This machine uses energy from a dc motor connected with a 9V-battery and a toggle switch 3-way 3-pin. This machine is very suitable to facilitate the process of packing the box carefully. In this paper, we will introduce the draft and implementation of low cost and easy to use in users.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The results of efforts and research that we as a group seek and collect to obtain the objectives and goals for the construction of this project. Nowadays, the coronavirus crisis has hit our country. Furthermore, it is very difficult for sellers to run their transactions smoothly. Therefore, sellers transact online. However, the current market has a problem with shipment or postage that required handling packaging. There are many machine wrapping tools to wrap the package. However, the machine is very complicated to use and requires a high cost to own therefore, we built Easy Wrap Machine to solve the problem. This machine can save time and is easy to use, besides it is also cheap and sound friendly. This can complete the wrapping package and save the wrapping process time and this is one of the advantages of this machine for online merchants.

2.2 The History of DC Motor

Prepared by MUHAMMAD NASRULLAH BIN JAMHAR (08DKM19F1001)

2.2.1 Introduction

In the history of DC Motor, DC Motor is one of the traditional electric machines, is appeared in the late 19^{th} century. In comparison to the other electric machine such as induction machines, brushless DC motors, the DC Motor has internal advantages such as simple control, large electromagnetic torque, the ability to adjust the speed with a wide range.

A direct current or DC motor converts electrical energy into mechanical energy. A DC motor consists of a stator, an armature, a rotor, and a commutator with brushes. The opposite polarity between the two magnetic fields inside the motor causes it to turn. DC motors are the simplest type of motor and are used in household appliances, such as electric razors, and electric windows in cars.

Through the production of our project, the dc motor plays an important role to rotate the base of the box gripper when connected with a switch to start the rotation of the box on the machine.

Figure 2.2.1 – DC Motor

2.2.2 Advantages and Disadvantages of DC Motor

Prepared by MUHAMMAD NASRULLAH BIN JAMHAR (08DKM19F1001)

ADVANTAGES	DISADVANTAGES
DC motors are smaller in size.	High maintenance costs
DC series motors have will high starting torque.	DC series motor has low speed when overloaded
DC motors have quick starting, stopping, reversing, and fast acceleration.	No speed control
DC motors are suitable for traction systems for driving heavy loads.	Cannot operate in explosive and hazard conditions due to sparking occurring at brush (risk in commutation failure)

Table 2.2.2 – Advantages and Disadvantages of Dc Motor

2.3 Grip Base

Prepared by AMMAR FAIZ BIN KAMAL ABAS (08DKM19F1012)

The function of the grip base in this project is to grip the box's base while the wrapping process. The grip base is placed directly onto the box's base and provides better grip and comfort. The grip base makes the base a little tighter or grippy with its grasp. This means that the grip base will be less likely to have the box slip out of the platform. The second advantage of using a base grip is that it is much easy to hold the box while wrapping.

The rotation for the grip base to rotate the box while the process. More specifically, there is a DC motor on the platform of the grip base that makes a rotation. It is connected to a switch and battery. The switch is for choosing what direction of the rotation. It is important if the wrapping process suddenly error. This switch will turn to another way to make the duct tape loose. So, it's much easier to adjust if there is an error in the wrapping process.

According to the configuration, an adjustable grip is generated by holding the box base with its size that is much easier to hold the base grippy and provide it from slip out and hard to grip. Thus, facilitate grip base to grip it.

2.4 Switch

Prepared by MUHAMAD HAFIFI BIN MOHAMED ROSLI (08DKM19F1025)

The toggle switch is a kind of electronic switch, which is one of the most basic and most widely used electrical components. Electronic switches provide binary switching control for circuits by interrupting the current flow or allowing current to recover. This is achieved by removing the metal contact from the terminal (the end of the circuit) or bringing the two back into contact. When the contacts are connected, the circuit is closed-charged-current can flow, and the connected device will open and operate. Then, when the contact is moved away again, the current is interrupted, the circuit is broken, and the device is turned off.

As a basic electronic component, toggle switches come in a variety of sizes and designs, which can be used in different settings. The internal contacts are made of a variety of conductive metals, including brass, copper, and silver, and are usually plated with gold or nickel. The toggle switch also provides different levels of contact resistance (i.e., sensitivity to current) and different maximum rated currents.

Among the few models of the main toggle switch:

Figure 2.4.1 – On-On Toggle Switch

Figure 2.4.2 – On-Off Toggle Switch

Figure 2.4.3 – On-Off-On Toggle Switch

Figure 2.4.4 – Momentary Toggle Switch

Through the production of our project, Toggle Switch 3 way (On-Off-On) plays an important role to rotate the base in a direction clockwise or anticlockwise. It also functions as an ON/OFF switch of the box gripper.

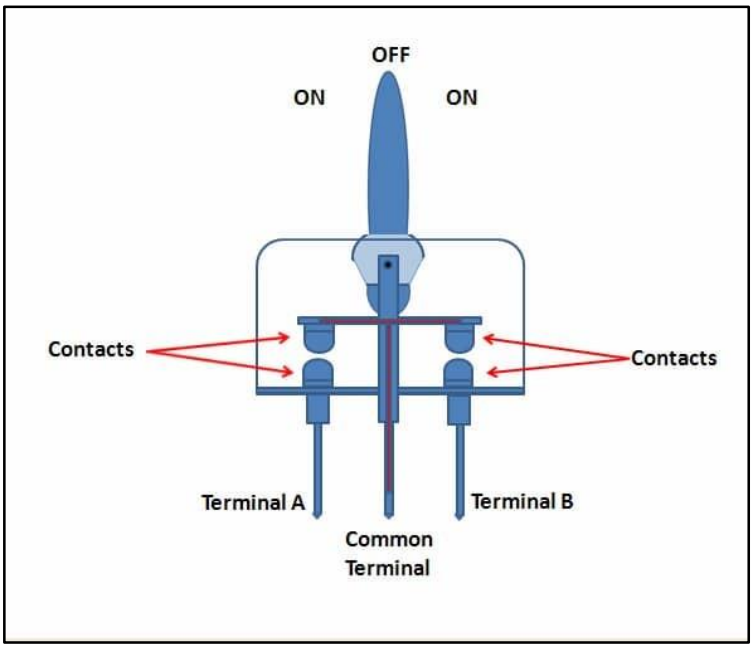

Figure 2.4.5 – Toggle Switch 3-Way 3-Pin Inside View

2.5 CHAPTER SUMMARY

In conclusion, the literature review is very important for us to learn about the selection of materials and methods that can be used in the production of our final project. After doing various research, the material suitable for our final project is the dc motor, switch, and grip base. Based on the advantages and disadvantages of these materials, we can learn to apply them to the production of our final project.

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

The methodology is a system used to design the process of product production, data collection, and analyze the data collected.

In this chapter, we will describe a lot of information related to the process and journey throughout the production of our final project. The Flow chart will describe the processes we went through. Meanwhile, the Gantt Chart shows the activities we did and planned over the 14 weeks in the implementation of our final project. However, in this chapter, we will show a sketch of our project design through the dimensions we estimated together. In addition, there is also material purchase, method selection, fabrication, and design analysis that we will explain in detail regarding the production of our final project.

3.2 FLOW CHART

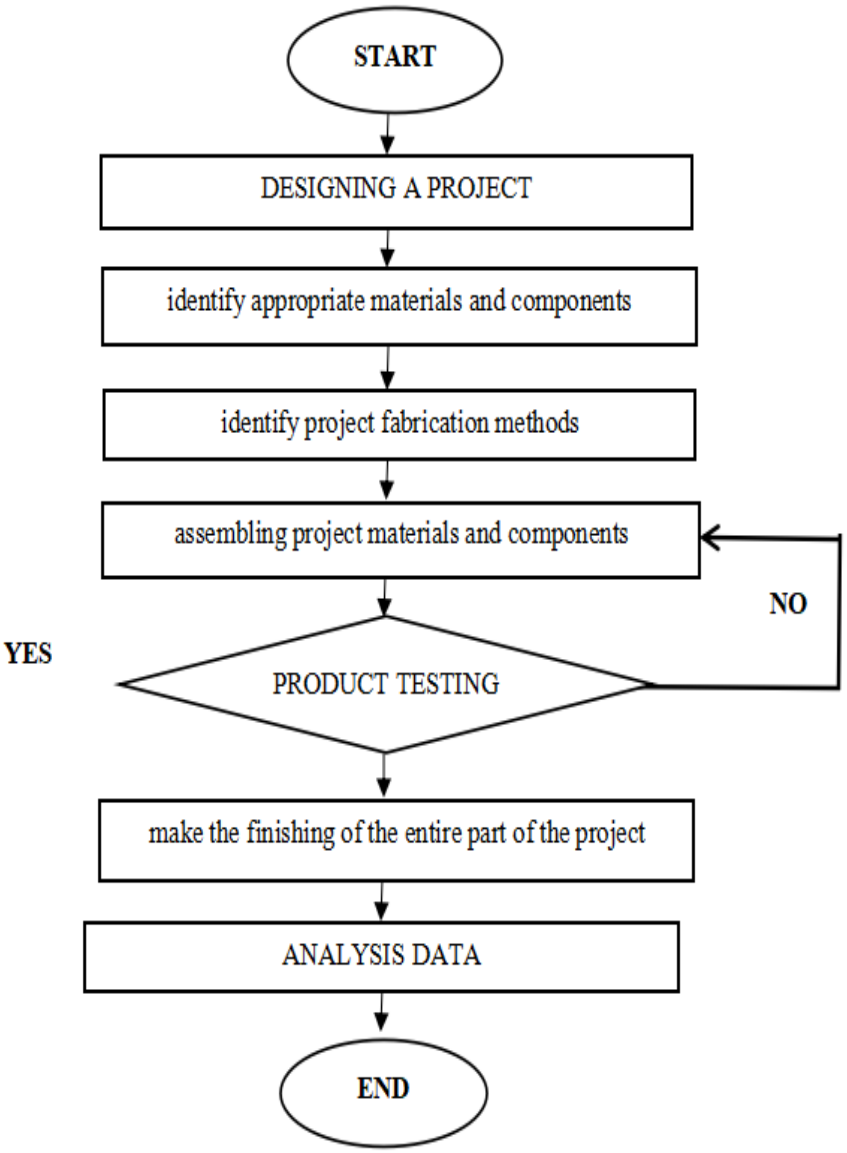

Figure 3.2.1 – Flow Chart

A flowchart is a visual representation of the steps and decisions required to execute a process. Each step in the series is noted in the chart shape. Connecting lines and direction arrows connect the steps in the process. This diagram allows anyone to view the diagram workflow and follow the flow logically from beginning to end.

3.3 FLOW CHART EXPLANATION

3.3.1 START

The most important thing is to start, but this is the first step in anything. A good start makes the rest more manageable and lays the foundation for the completion of the project. When anything ends, the result depends to a certain extent on how it started. Define and determine the main meaningful goals of the project that will ultimately lead to the success of the project. In the long run, these goals will save time by accelerating the overall project strategy. Identify the specific achievements, actions, and obstacles associated with each goal, as well as a separate action plan for achieving the goals and overcoming obstacles.

3.3.2 PRODUCT DESIGN

Prepared by MUHAMMAD NASRULLAH BIN JAMHAR (08DKM19F1001)

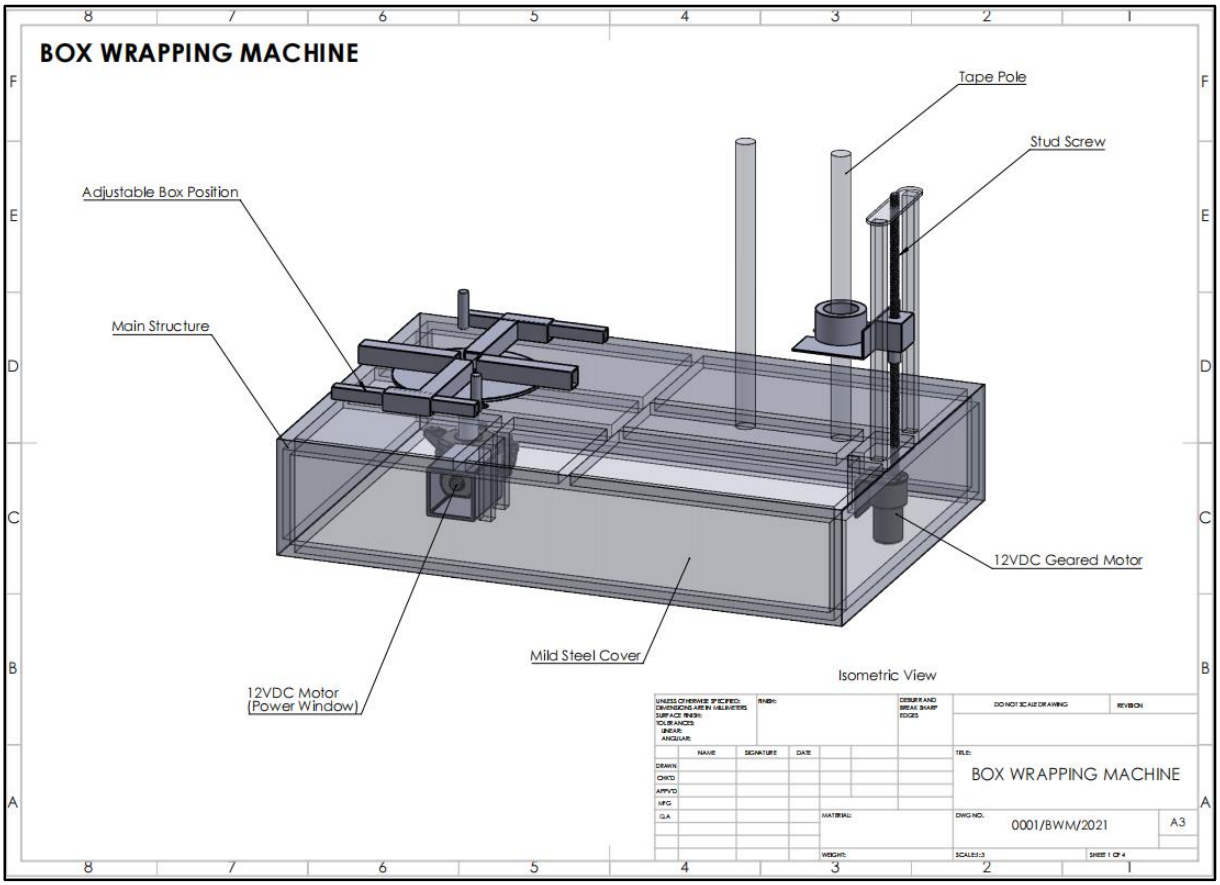

Figure 3.3.1 – Easy Wrap Box Machine

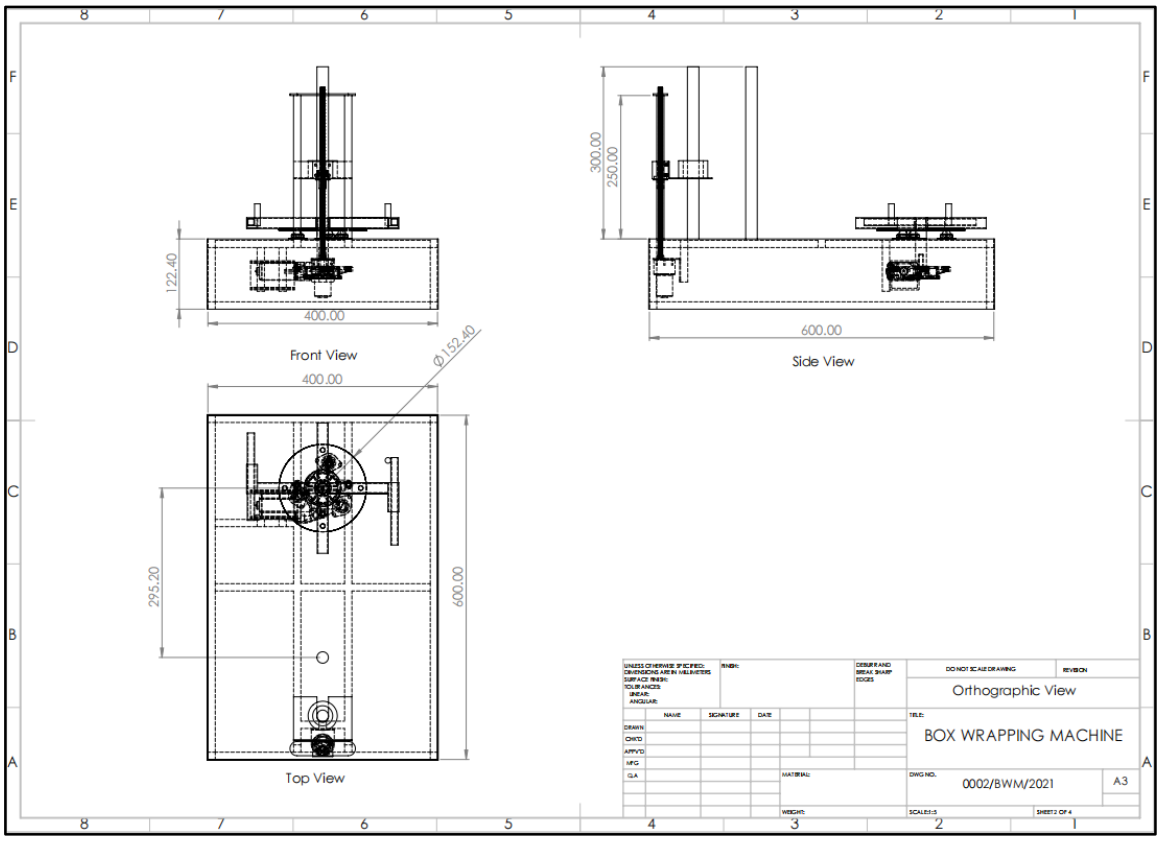

Figure 3.3.2 – Orthographic View

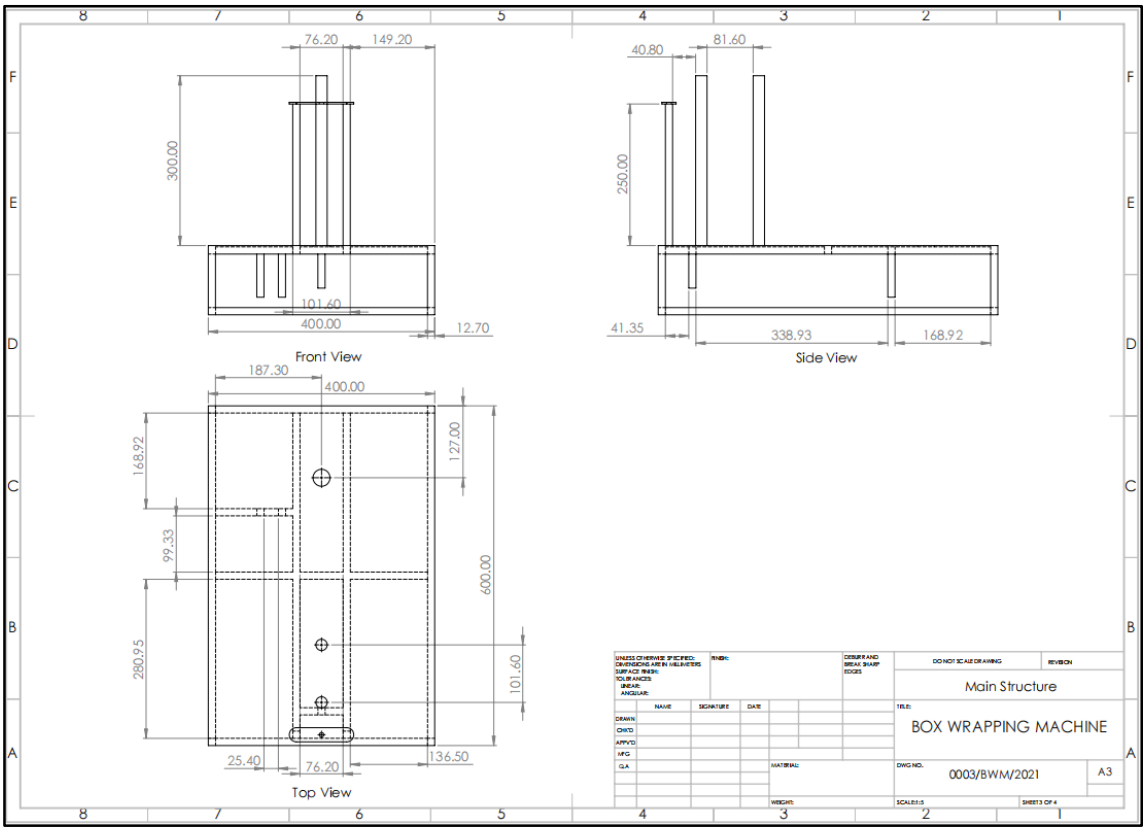

Figure 3.3.3 – Body of Easy Wrap Box Machine

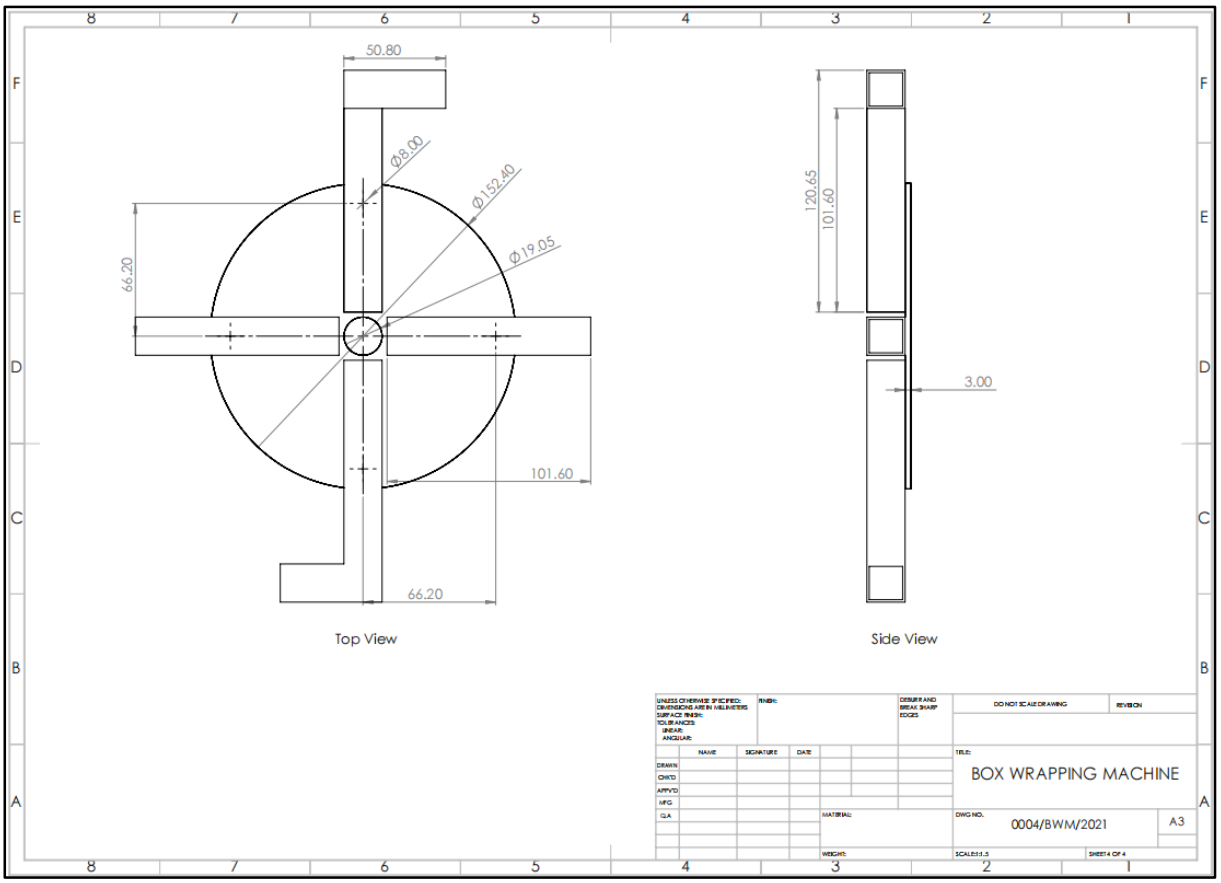

Figure 3.3.4 – Grip Base View

3.3.3 MATERIAL PURCHASE

Prepared by AMMAR FAIZ BIN KAMAL ABAS (08DKM19F1012)

When we produce any product, investment in the raw material is 50% to 60% of the total cost of the product. So, it is very necessary to buy the raw material at a low cost. If we reduce the 10% cost of buying raw materials, it means, we have increased our 10% profit. The purchase department will make full planning of his purchase. Everything should be planned. Purchasing involves acquiring materials of the right quality in the right quantity at a reasonable price and at right time. Therefore, to carry out material purchasing, a well-made purchasing plan needed to be made. First, the suppliers will be contacted to make sure of the availability of the materials. Then, the calculation of the number of materials needed and also the price of the materials. After that, surveys of the price must be carried out to determine the better selling prices. Then finally, the purchases could be made.

Figure 3.3.5 – 9-Volt Battery

This is a nine-volt battery, it is forgiving energy to DC motor works.

Figure 3.3.6 – Toggle switch 3-Way 3-Pin

This is the toggle switch 3-way 3-pin. To turn the DC motor and determine the way of the DC motor. Either clockwise or anticlockwise.


Figure 3.3.7 – DC Motor

This is a DC motor. It will rotate the platform while the wrapping process.

3.3.4 METHOD SELECTION

Prepared by MUHAMAD HAFIFI BIN MOHAMED ROSLI (08DKM19F1025)

Method Selection plays an important part in the overall design of production and operations to satisfy the needs of the product. Method selection involves strategically choosing which types of work processes to include in the production of a product. Each step in the production process can be completed in a variety of ways. Choosing the right processes most efficiently can increase production output, decrease operational costs and enhance product quality.

The goal of method selection is to realize the form of a method that fulfills the needs of the product and contributes many potentially beneficial ways explored, hence the development of better products for users.

Welding

There are four main types of arc welding processes which are stick welding, gas welding, TIG welding, and MIG welding. For this welding process, we chose MIG welding for our machine-making process. In MIG welding, an electric arc is formed when the ends of the electrode wire come into contact with the base metal. The arc produces heat that will melt the base metal and the ends of the electrode. Electrode melting and metal base mixed to create the molten weld pool and when cold will produce weld metal. Electrode wire without coating is supplied continuously (in the form of looping) through the wire feed unit. Inert gas supplies protect arcs and molten weld pools from atmospheric air.

Figure 3.3.8 – Welding

Circuit Wiring

Wiring systems are mostly standardized using multiple rules, regulations, and laws. The electrical wiring must be installed correctly and safely by electrical codes and standards. If the electrical wiring is incorrect or does not meet any standards, it may cause short circuits, electric shocks, damage to equipment/appliances, or equipment failures, thereby further shortening the life of the equipment.

Figure 3.3.9 – Circuit Wiring

3.3.5 FABRICATION

Prepared by AMMAR FAIZ BIN KAMAL ABAS (O8DKM19F1012)

Measuring

Measuring is important to start a project. We measured the length and area of the base grip site so that it was in a balanced state under the armpit of the packing process. We also make sure that the size of our base grip can grip according to large to small packages, that is, we use free size grips. We have measured and calculated the limits for the package gripper so that we can estimate the size of the package that is suitable for use in our project.

Making Component

Custom-made components have been made to fit and connect the middle pole, wrapping tape holder, and grip base. We made this custom component to make the wrap progress smoothly and easier to use. Other than that, this custom component is also used to save the packaging from taking damage or error in wrap progressing.

Assembly

This is the final step of the fabrication process which is assembly all the parts and components that had been measured and confirmed their position and measurement. This assembly process has been made from below to the top because it is easier to assemble. In the base, we connect the toggle switch 3-way 3-pin to 9V battery holder and DC Motor with wire into grip base. It is to make the grip base rotates.

3.3.6 PRODUCT TESTING

Prepared by MUHAMMAD NASRULLAH BIN JAMHAR (08DKM19F1001)

To test the overall function of our project machine, the testing process of the box gripper was done first. The first method we used on a box gripper was to use a spring to grip the sides of the box. The process of testing the gripper with the spring has been done on a box. As a result of the testing process, we found that the spring joint gripper method is not suitable to be used to grip the sides of the box during the wrapping process. So, we have discussed switching to the latest method i.e., by using bolts and nuts on the box gripper. A testing process on the gripper with bolts and nuts was done and the result we found was that the box could be gripped firmly during the wrapping process.

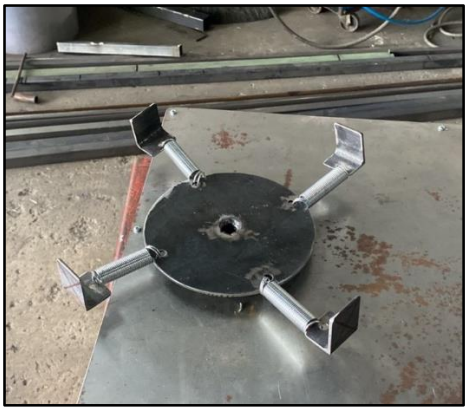

Figure 3.3.10 – Gripper with spring

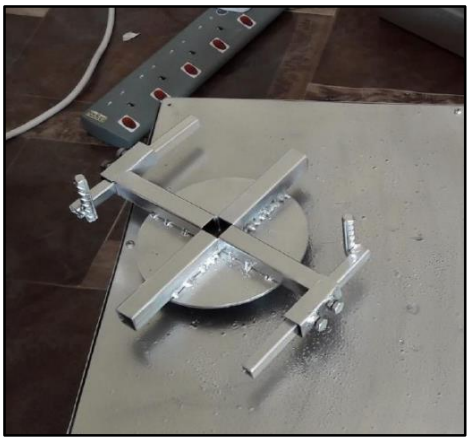

Figure 3.3.11 – Gripper with bolt & nut

3.3.7 ANALYSIS DATA

Prepared by MUHAMAD HAFIFI BIN MOHAMED ROSLI (08DKM19F1025)

The design analysis was conducted on the packaging machine to ensure it can wrap the box quickly and neatly and also can function well. We also have done some research which is observation and questions to random people, especially to businesses.

There is the list of question observations:

1. Do you have used some products for wrapping a box neatly and quickly?
   Yes ( ) No ( )

2. Do you know someone who needs this product?
   Yes ( ) No ( )

3. Do you agree with the design of a box packaging machine that uses an electric motor system?
   Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree ( )

4. Do you agree this machine can simplify the work of packing the box?
   Strongly disagree ( ) Disagree ( ) Agree ( ) Strongly agree ( )

5. In your opinion, is it necessary to innovate this product for more effective box packaging and convenience for consumers?
   Yes ( ) No ( )

3.3.8 REPORT WRITING

Reports cover a variety of topics but usually focus on delivering information with a clear purpose to specific readers. The report is the result of research and analysis of data. Specific guidelines should be referred to for the requirements of the accurate content of the report. The report may contain the following elements: introduction, literature review, methodology, survey results, and conclusions. A good final report is an accurate, objective, and complete document. Essentially, it must be well written and structured to meet the examiner's expectations.

3.3.9 FINISH

Completing and delivering a project to learn some meaningful things that will help the project move forward. To complete the work that has already started, the biggest known obstacles are anxiety, doubt, and hesitation. The realization of the final product and the great things will have the expected problems, which need to be dealt with empathy. Doing so helps to understand what needs to be improved and brings opportunities for change to the project.

3.4 BUDGET CALCULATION

Prepared by AMMAR FAIZ BIN KAMAL ABAS (O8DKM19F1012)

No.	Material/Equipment	Price/Unit (RM)	Quantity	Total (RM)
1	- Mild Steel Hollow (50mm x 50mm x 3mm)	RM 5.20/feet	1 foot	RM 5.20
2	- Mild Steel Hollow (19mm x 19mm x 1.2mm)	RM 1.60/feet	16 feet	RM 25.60
3	- Mild Steel Plate (Thickness1.2mm)	RM 4.90/pieces	6 pieces	RM 29.40
4	- Mild Steel Plate (Thickness 3mm)	RM 8.80/pieces	2 pieces	RM 17.60
5	- Mild Steel Pipe 19mm (Thickness 1.5mm)	RM 4.20/feet	2 feet	RM 8.40
6	- Geared Motor Coupling	RM 16.90/unit	1 unit	RM 16.90
7	- Geared Motor Bracket	RM 14.50/unit	1 unit	RM 14.50
8	- M8 Lead Screw	RM 36.00/feet	1 foot	RM 36.00
9	- M8 Lead Screw Nut	RM 8.50/unit	1 unit	RM 8.50
10	- M8 Shaft Holder Flat Eye	RM 18.00/unit	1 unit	RM 18.00
11	- Set Bolts and Nuts (M8, M6)	RM 5.00/set	1 set	RM 5.00
12	- 12VDC Geared Motor 30rpm	RM 68.00/unit	1 unit	RM 68.00
13	- 12VDC Motor Power Window	RM 68.00/unit	1 unit	RM 68.00
14	- 12VDC Speed Controller (6A)	RM 82.00/unit	2 unit	RM 164.00
15	- Power Supply 240VAC-12VDC (12-5A)	RM 88.00/unit	1 unit	RM 88.00
16	- Control Panel Box (PVC)	RM 26.80/set	1 set	RM 26.80
		TOTAL AMOUNT		**RM 599.90**

Table 3.4.1 Budget Calculation

3.5 CHAPTER SUMMARY

This chapter describes the research methodology used to collect and analyze the data required to address the research questions and to test the hypothesized relationships developed in this study. The chapter begins with a discussion of the material purchase, followed by method selection, budget calculation, and fabrication. The chapter then continues with descriptions of the product design. Next, the discussion catcher on data collection methods. Finally, the choice methods of data analysis are discussed.

CHAPTER 4

RESULT

4.1 INTRODUCTION

For this chapter, we collected all the data from the analysis questionnaire that we have made for the production of our final project which is the Easy Wrap Box Machine. All of these data are very important for the production of our final project to know that our project is suitable for all sections of society. Next, we had a discussion to identify the pros and cons of our final project.

4.2 ADVANTAGES AND DISADVANTAGES

Prepared by AMMAR FAIZ BIN KAMAL ABAS (O8DKM19F1012)

Every project has its pros and cons, the pros of this project are will help our online sellers to wrap their packaging for the customer neatly and easily and faster to wrap it. Also, this product will make it easier for the community to wrap anything their want for delivering purposes, such as a birthday box.

However, there is one disadvantage about our project, which is the occurrence error in wrapping progression like the adhesive tape stick together its surface. Therefore, we find a solution for these cons, we input a 3-way switch in our project to solve the problem. We must be improved or change for the future so that we could enhance the good and very efficient products that hardly find a disadvantage of the project.

4.3 RESULT FOR ANALYSIS QUESTIONNAIRE

Prepared by MUHAMAD HAFIFI BIN MOHAMED ROSLI (08DKM19F1025)

This is one of the results from the questionnaire:

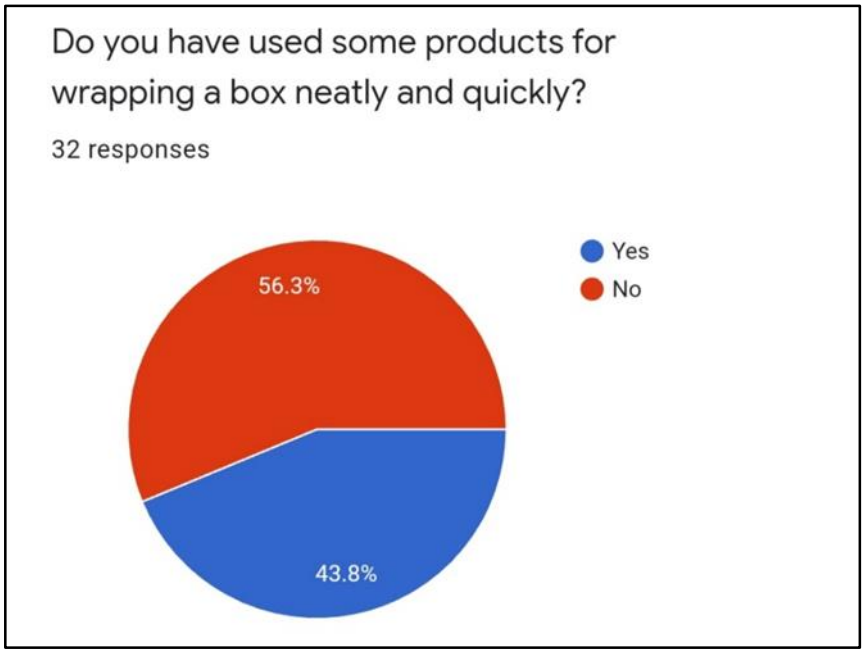

Figure 4.2.1 – Result of Question 1

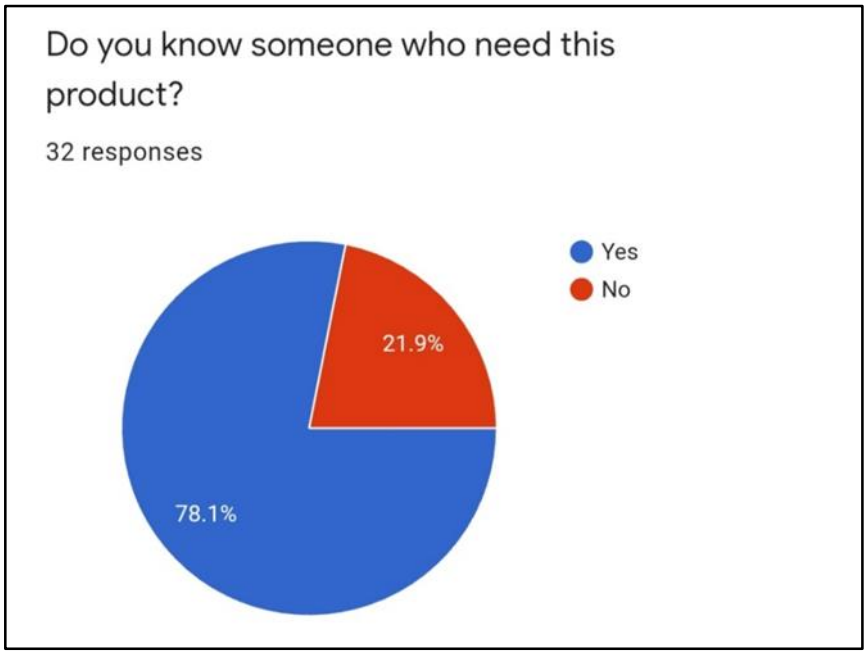

Figure 4.2.2 – Result of Question 2

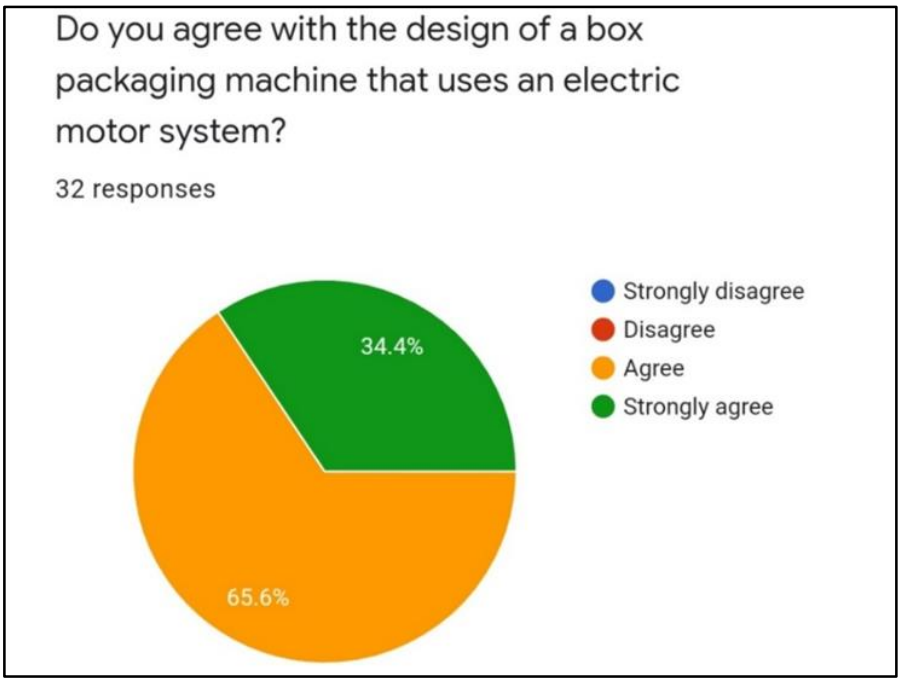

Figure 4.2.3 – Result of Question 3

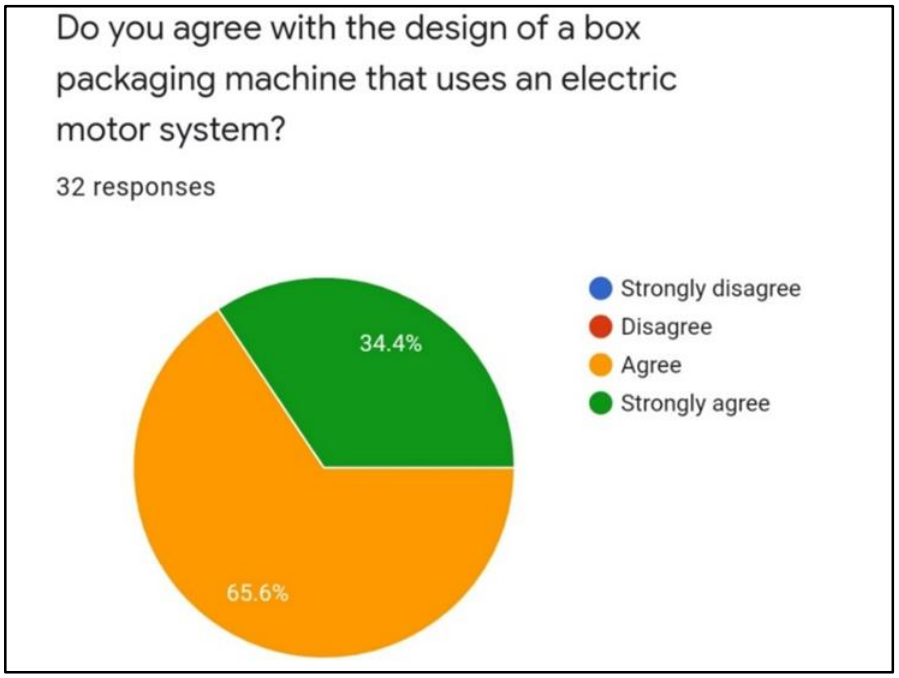

Figure 4.2.4 – Result of Question 4

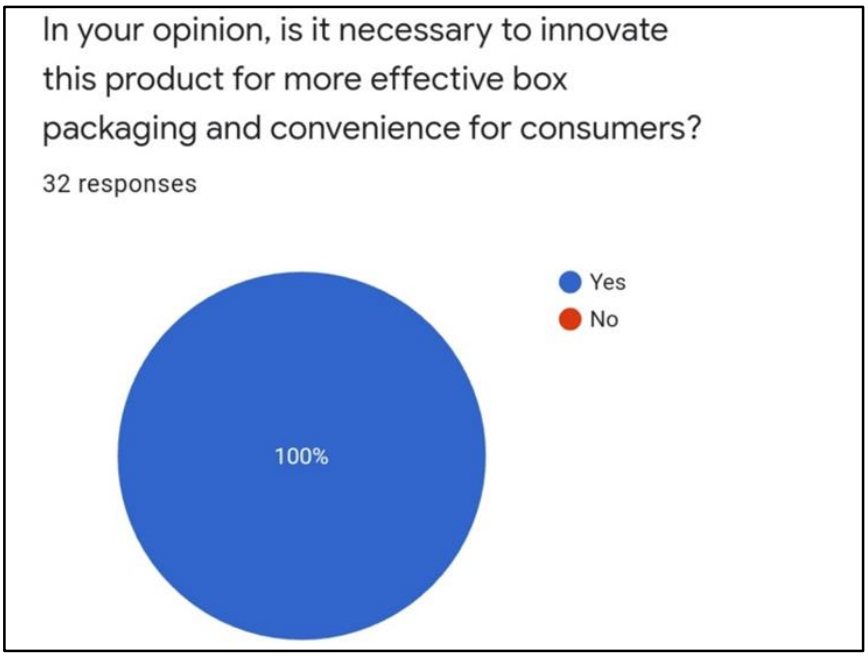

Figure 4.2.5 – Result of Question 5

For the result, we combine the data from the questionnaire of the Easy Wrap Box Machine. This data is very important for this project to let us know that our project is suitable for businesses. After receiving all of this data, we analyze every single thing that can make it perfect. Every project has its pros and cons, the pros of this machine can wrap the box quickly and neatly. However, the cons must be improved or changed for the future so that we could enhance the good and very efficient products that hardly find a disadvantage of the project.

From the data, we analyze that 46.9 % strongly agreed that the machine can simplify the work of packing the box and 53.1% agree that the machine can simplify the work of packing the box.

4.4 CHAPTER SUMMARY

In conclusion, we have jointly analyzed the data collected for the successful production of the Easy Wrap Box Machine. We have researched our project and have found some of its distinct advantages. However, there are also a few shortcomings and we will work to rectify those shortcomings over time.

CHAPTER 5

DISCUSSION

5.1 INTRODUCTION

For this chapter, the decision is based on all the results obtained from the tests conducted and the discussions in the previous chapters. In this chapter, relevant matters are also related to the objectives of the research and recommendations for the research carried out. In addition, the conclusion of this test was also drawn.

5.2 DISCUSSION

Prepared by MUHAMMAD NASRULLAH BIN JAMHAR (08DKM19F1001)

To test the overall function of our project machine, the testing process of the box gripper was done first. The first method we used on a box gripper was to use a spring to grip the sides of the box. The process of testing the gripper with the spring has been done on a box. As a result of the testing process, we found that the spring joint gripper method is not suitable to be used to grip the sides of the box during the wrapping process. So, we have discussed switching to the latest method i.e., by using bolts and nuts on the box gripper. A testing process on the gripper with bolts and nuts was done and the result we found was that the box could be gripped firmly during the wrapping process.

Prepared by AMMAR FAIZ BIN KAMAL ABAS (O8DKM19F1012)

Next, we run a testing process for tape movement. We chose stretch wrapping tape to wrap the box. It is easy to use wrapping the specified box size. The first method for tape movement, we fasten the bold stud together dc motor by using coupling. The bold stud is fitted with an aluminum bush along with the lead nut. In addition, we fastened the holder tape to the aluminum bush along with the lead nut. it is fastened to the aluminum bush using screws. The purpose of us tying it with bold studs and the aluminum bush is to keep the movement of the holder moving from top to bottom. This movement ensures that the sides of the box are wrapped perfectly and tidy. the results of this testing went smoothly and we were able to wrap the box beautifully and neatly.

Prepared by MUHAMAD HAFIFI BIN MOHAMED ROSLI (08DKM19F1025)

Finally, we run testing on the success of the wiring. For the switch, we choose the On-Off-On Toggle Switch. We chose the toggle switch because it has 6 wire connection points to connect the power supply and speed controller. For power supply, we use power supply 240VAC 12VDC (12 5A). This power supply server has multiple protection such as overload protection, short circuit protection, over-voltage protection, safe and efficient to use. In addition, it is also global applications such as adjustable output voltage and automatic voltage regulation. The testing process on the wiring has been done and we found that it works smoothly and can control the movement of the box gripper and stud screw well.

5.3 CONCLUSION

Prepared by AMMAR FAIZ BIN KAMAL ABAS (O8DKM19F1012)

The main objective of this machine is to wrap the box packages neatly and quickly. we test each of the components so that we can obtain whether the machine is still working or not. This machine is also modified if there are technical problems. The results of this test that we run will be able to create an efficient wrapping machine and tidy the wrap.

Prepared by MUHAMMAD NASRULLAH BIN JAMHAR (08DKM19F1001)

Overall, the Easy Wrap Box Machine that we produce can work well in wrapping a box. Through the evaluation that has been done on the machine, we found that our machine has met the prescribed design features. Moreover, we have estimated that this machine can function well up to only 2 years. This machine needs to be maintained in case there is damage to the electric motor parts and wiring connection parts.

Prepared by MUHAMAD HAFIFI BIN MOHAMED ROSLI (08DKM19F1025)

Overall, the Easy Wrap Box Machine can help and facilitate online businesses in the process of wrapping boxes neatly in large quantities. In addition, it will also help launch the box packing process. The advantage of this Easy Wrap Box Machine is that it is also a portable machine and has a variety of functions for the process of wrapping the box neatly.

5.4 CHAPTER SUMMARY

The results of the testing that have been conducted on the Easy Wrap Box Machine it can be concluded that this machine achieves the objective of the study which is to design a wrapping machine design that can do much better work than other machines for wrapping a box. In addition, after several tests of Easy Wrap Box Machine, it has proven to be successful and useful for online businesses because the machine can simplify and launch the wrapping box process neatly and save time. Lastly, this machine is portable making it easy to store after use.

APPENDIX

APPENDIX A	Gantt Chart (Project 1)
APPENDIX B	Gantt Chart (Project 2)

APPENDIX A

Gantt Chart (Project 1)

Project Activity	Week													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Briefing of the final project														
Brainstorming idea and finalizing the idea														
Research														
Material selection														
Design														
Method selection														
Material purchase														
Analysis data														
Proposal														
Making slide presentation														
Presentation and submit														

Planning	
Actual	

APPENDIX B

Gantt Chart (Project 2)

WEEK / ACTIVITY	M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	M 13	M 14
Course registration														
Write a final report														
MyIPO registration														
Assemble project materials and components														
Product testing														
Finish the entire part of the project														
Analysis data														
Plagiarism review(Turnitin)														
Persembahan Kemajuan Projek (*Project Progress Presentation*)														
Presentation Preparation														
Abstract review by supervisor														
Technical Paper Review by supervisor														
Correction/Refinement of Final Report														
Abstract Review by Interpreter														
PITEX JKM Video, technical paper, poster, Abstrak (after review)														
Submission of Final Report														
RICE PSA														
Logbook Submission														

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