



**DIPLOMA IN MECHANICAL
ENGINEERING DJJ50193: PROJECT 2
COOKIES & CONFECTIONERY HAND PRESS
CLASS: DTP5A**

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DECLARATION OF ORIGINALITY AND OWNERSHIP





TITLE: COOKIES & CONFECTIONERY HAND

PRESS

SESSION: II 2023/2024

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2. We represent that the Project and the intellectual property contained there is original work / design without taking or imitating any intellectual property from other parties.
3. We hereby agree to relinquish the ownership of the intellectual property in 'the Project' to Polytechnic to fulfil the requirement for the award of Diploma in Mechanical Engineering to us

Subscribed and solemnly declare by the above named;

- | | | |
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ACKNOWLEDGEMENT

Thousands of thanks and appreciation are expressed to Encik Ismail bin Lias as a the supervisor of the our final year project for willing to guide and provide guidance throughout the making of this proposal. Without his help and guidance, it is impossible for us to complete the paperwork for this project 1.

A wreath of appreciation is also expressed to all the team members who are willing to give commitment in terms of time and energy to complete this paper. Thanks to the contribution of thoughtful ideas and not being stingy in sharing knowledge from all members, the process throughout the writing of this proposal paper has been completed.

Finally, many more thanks to all the family members who give solid support and pray for us day and night. Despite the constraints, with the blessing of their love and affection, we are motivated to complete the assigned tasks

Thank you.

ABSTRACT

The goal of the Cookies and Confectionery Hand Press Project is to create a multipurpose, manual tool that makes creating different-shaped cookies and confectionery items easier and more enjoyable. The goal of this project is to provide small-scale confectioners and home bakers who want to achieve uniformity and accuracy in their products without having to rely on costly or complicated machinery with an effective tool that is also easy to use. A variety of interchangeable molds will be able to be accommodated by the hand press device's engineering, enabling a broad range of patterns and shapes. Ergonomics will be given top priority in the design to minimize user fatigue and guarantee usability. To ensure long-term usability and hygiene, the hand press will be made of materials that are food-safe, sturdy, and simple to clean. The project will refine the gadget to satisfy the high standards of performance, durability, and aesthetic appeal through iterative prototyping and user testing. The ultimate goal of this project is to empower small business owners and baking aficionados by offering an inexpensive, dependable equipment that improves productivity and creativity in the creation of cookies and confections

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CHAPTER 1: INTRODUCTION

Cookies and confectionery very important in Malaysia because of the different races and culture that we have in here, it open so many job opportunities to increase the human life. Malaysia has a diverse influence which is Malay, Chinese, Indian and European, reflecting the country's multicultural society. This also known as gifting culture because it is commonly presented as gifts or souvenirs, especially during festive seasons for the sign of goodwill and to celebrate communal harmony. Those also are more often used as festive treats, especially very popular during festive seasons like Hari Raya, Chinese New Year, Deepavali and Christmas where these sweets are made or bought in large quantities to be shared with family and friends. The importance of these cookies and confectionery are to show the cultural significance that are an integral part of Malaysia's rich cultural heritage, which is representing the melding of various ethics influences through food. This can lead to tourism attraction because of we have the unique and flavorful Malaysian sweets and can offer them to visit the taste of local culture.

Cookies and confectionery machine a kind of machine which can produce many kinds of unique design snacks and cookies, it is made of stainless steel, clean and healthy. By changing the mold, the raw material can be squeezed out and molded into different shapes of cookies. There is a big chance in market growth potential as the global interest in exotic and unique flavors presents opportunities for Malaysian cookies and confectionery brands to expand internationally. The economic opportunities also can create jobs, encouraging entrepreneurship and facilitating exports that can help Malaysia became more known to the rest of the world

Based on all the information we get to know that the cookies and confectionery is playing a very big role in Malaysia and we can make a big different if we focus on it seriously for creating a better future.

1.1 BACKGROUND

Over the past few decades, the cookies sector has grown and diversified significantly due to rising customer demand for distinctive, superior treats. Consequently, there's a booming market for gadgets and supplies that let home cooks and small-scale confectioners alike create elaborate, high-quality items right in their kitchens. Conventional techniques for moulding cookies and candies can need for a great deal of expertise and patience, and the instruments that are available may be either too basic or too expensive and sophisticated for small-scale businesses

To close the gap between human and automated production methods, we create the Cookies and Confectionery Hand Press project. The project's goal is to produce a hand-operated press that is easy to use and precise enough to generate a wide range of forms and designs. This kind of press would be very useful for small company owners, home bakers. Hand presses have been used historically to make sweets and confections in a variety of forms by diverse cultures. Though still useful, these old-fashioned technologies frequently fall short of the adaptability and simplicity of use that contemporary users want. There is a chance to re-imagine the hand press and make it more robust, useful, and accessible thanks to developments in ergonomic design and materials science

The aim of this project is to create a hand press that not only satisfies these contemporary demands but also improves baking as a whole. To accommodate a wide range of creative possibilities, the gadget will include interchangeable molds, guaranteeing users can make outcomes that are both consistent and aesthetically beautiful. Furthermore, the emphasis on ergonomics attempts to solve typical problems like hand strain and fatigue by making the hand press comfortable to use for extended periods of time. This project, which applies theoretical knowledge to a practical situation, is especially pertinent for diploma students studying engineering and design. It includes elements of user-centred design, manufacturing procedures, material selection, and mechanical design. In summary, the Cookies and Confectionery Hand Press Project seeks to innovate within a traditional field by leveraging modern design and engineering principles. The goal is to create a tool that empowers users to explore their creativity and produce high quality confections with greater ease and enjoyment

1.2 PROBLEM STATEMENT

- Some of the existing machine can only produce limited types of cookies.
- For a manual cookie tool and equipment, it takes long time to make more cookies at one time.
- Takes a lot of time and energy to create cookies for a manual cookie cutter.
- Existing cookies making machines are unsuitable for small business/industries because it is too expensive and huge to place it at the home or small premise.
- The shape of the cookie mold is limited.



Figure 1.1 Biscuit Cookies Press Maker and Automatic Industrial Cookies Machine

1.3 OBJECTIVES

- To design product that can produce various shapes of cookies by changing the shape of the mould on the product.
- To design product that can make a large quantity of cookies at one time.
- To build a product in smaller form can save costs for small industries.
- To create product to save time and energy especially for small industry

1.4 SCOPE OF PROJECT

- Our product's consumer is a Small-scale bakery, home bakers who have limited cost.
- Adjustable and portable cookies mould - can change the shapes of cookies mould.
- Detailed instruction manual provided.
- Fully manual - hold the toggle lever and press it to produce the cookies.
- One pressing process can produce 20 cookies at one time.

1.5 CONCLUSION

The Cookies and Confectionery Hand Press Project successfully demonstrates the integration of traditional baking tools with modern design and engineering principles. Through this project, we can gain practical experience in product development, encompassing design, material selection, and user ergonomics. The resulting hand press is an innovative, versatile, and user-friendly device that meets the needs of home bakers and small-scale confectioners. It enhances the ease and precision of creating intricately shaped cookies and confectioneries, thereby fostering creativity and efficiency.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

A literature review is a thorough assessment and synthesis of previous research and scholarship on a certain topic or research question. Its primary function is to provide context by summarizing the current state of knowledge in the field, identifying gaps and inconsistencies in the literature, critically evaluating existing research, synthesizing findings to identify common themes or trends, informing research design and methodology decisions, and supporting the theoretical framework or arguments presented in the research. Overall, a literature review is an essential component of academic research, guiding scholars through their examination of a topic and ensuring that their work adds substantially to the existing body of knowledge.

2.2 EXISTING PRODUCT & PREVIOUS DESIGNED

2.2.1 Cookies Mold

ABSTRACT

Cookie molds are gadgets used to make decorative cookies. A mold's intricate designs create bas-relief surface on the cookie dough, producing cookies that are detailed, edible works of art. While the first molds were made of carved wood, today they are produced by specialty cookware and bake ware manufacturers in plastic, metal, terra cotta, resin, silicon, cast iron, and ceramic. Designs are available in an almost limitless number of patterns. A cookie mold may be quite simple, just embossing shape into the dough. Others are quite elaborate, producing cookies that are three-dimensional baked art.



Figure 1.2 the variety of shape of cookie mold

2.2.2 Manual Press Cookie

ABSTRACT

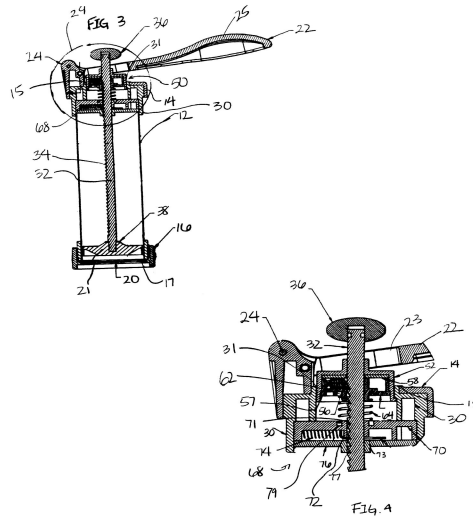


Figure 1.3 Manual Press Cookie

This product is designed by Hugh Melling . This equipment for filling a food item consists of a housing, a barrel connected to the housing, and a pivotally attached lever. The barrel receives and stores the food material that will be handed out. A rod with teeth is attached to a plunger that slides within the barrel. An advance mechanism is movable within the housing. The advance mechanism consists of an escapement body, a driver, and a spring that activates the driver. The driver engages the teeth on the rod to move the plunger, and the food product is pushed out of the barrel. These information above explained the mechanism and how these product works.

2.2.3 Cookie Biscuit Machine

ABSTRACT



Figure 1.4 Cookie Biscuit Machine

This machine is created by Shanghai Kuihong Food Machinery Factory which is Cookie Biscuit Machine manufacturer in China. The PLC cookies machine is the new kind of cookie machine shapes forming machine which are automatically controlled. You can set the cookie forming ways (depositing or wire cutting), working speed, space between cookies, etc by touch screen. We have dozens of nozzle type for choice or we can customize the special nozzles as your requirements. This machine uses a servo motor. For baking, you can use rotary oven, deck oven or tunnel oven. It is the new equipment on the market.

2.2.3 Automatic Biscuit Making Production Line Multifunctional Cookie Machine

ABSTRACT



Figure 1.5 Automatic Biscuit Making Production Line Multifunctional Cookie Machine

This machine is created by Guangdong Xunlian Intelligent Technology Co., Ltd company. Based on R&D and manufacturing experience, the product line covers the equipment required at different stages of the baking process, including cake filling cream paste coating, cake cutting and paper insertion, cookie production over drawing, cake rolling, dough, baking, egg brushing, etc.

2.3 CONCEPT OF MECHANISM

The concept of mechanism that we acknowledge from our Cookies and Confectionery Hand Press Project is hand press mechanism. For the purpose of the database, and by long tradition, the term hand press is reserved for flat bed printing presses with a horizontal platen operated by manually pulling or pushing a lever to press the platen against the paper which is in contact with the inked image resting on the bed of the press. Such presses were used since before the time of Gutenberg until the early twentieth Century. Other names are often used to designate particular types of hand press—the wooden ‘common press’ for example, and the ‘iron hand press’ such as the familiar Washington, Columbian, Albion, Stanhope and others—but ‘hand press’ is the most general term as so will be used here for the printing machines included in the database.

From a technical and operational point of view, hand presses are upright frames holding a horizontal ‘platen’ operated by a long ‘bar’, and a ‘bed’ which carries the printing ‘forme’ (the text and/or images to be printed). To make an impression the forme is inked, a sheet of paper is placed on it and the bed is slid in under the platen. Once the impression has been made the bed is slid back out from under the platen, the printed sheet is removed, and the forme is re-inked by hand, ready to receive a fresh sheet to be printed.

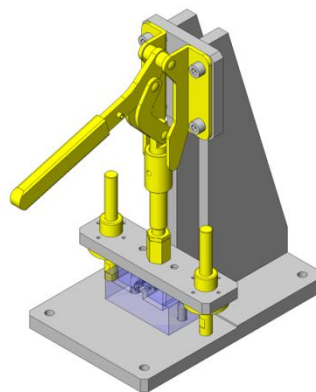


Figure 1.6 The example of CAD drawing which implement the concept of hand press mechanism

2.4 MATERIAL RESEARCHES

a) 316 Stainless Steel

Grade 316 stainless is an austenitic stainless steel alloy with a high chromium and nickel content. Based on the article written in website, Like many steel alloys, it has a continuous use temperature several times higher than most food making processes will ever require (more than 800°C, or 1472°F)

Specifically, in the food industry, stainless steel is exposed to heat, water, and harsh cleaning chemicals. Through those exposures, food grade stainless steel must remain durable, rust/corrosion free, and be easy to sanitize. Further, the pitting resistance means it maintains a surface that's easy to clean and maintain. Finally, the heat resistance of the metal means it can be exposed to extreme temperatures without risking damage

What makes the grade 316 alloy an ideal food grade steel sheet material is the fact that it has a high resistance to acids, alkalies, and chlorides (such as salt). Other austenitic stainless steels, such as grade 304 SS, can experience severe pitting corrosion when exposed to salt, which is often present in food products. 316 makes for great food grade stainless steel containers for nearly any food application.



Figure 1.7 The application of 316 stainless steel in food processing

b) 304 Stainless Steel

304 stainless steel is a versatile and widely used material in the food industry due to its excellent balance of properties. Its main applications in food-related contexts include brewing equipment, dairy processing, and general food processing machinery.

The chromium content in 304 stainless steel forms a protective oxide layer on the surface when exposed to air, providing excellent corrosion resistance. This property makes it ideal for equipment that handles acidic foods or cleaning solutions. Additionally, its formability and weldability allow for the creation of complex shapes and integrated systems, which is particularly useful in food processing facilities.



Figure 1.8 Stainless Steel 304 production

2.5 MORPHOLOGY CHART

After some studies and literature researches about everything that related to our Cookies and convectionary Hand Press machine, we have created a morphology chart involves listing possible options for each design element of the Cookies & Confectionery Hand Press Machine .

TYPES OF MATERIAL	SUS304 STAINLESS STEEL	316 STAINLESS STEEL	6061 ALUMINIUM
TYPE OF MECHANISM	FULLY-AUTOMATIC	SEMI-AUTOMATIC	FULLY-MANUALLED
TYPE OF MOULD	FIXED	PORTABLE-COOKIE MOULD	NONE

Figure 1.9 Morphology Chart

2.6 CONCLUSION

By doing this project, we found that our project can help small industries in making cakes. Our project was created to save time in making cakes and save costs in paying for electricity. Our projects can also be purchased at a cheaper price than expensive sophisticated machines such as those used in large industries that make cakes. We hope our project can grow successfully and bring joy to the small cake making industry out there

CHAPTER 3: METHODOLOGY

3.1 INTRODUCTION

The methodology used to plan, create, and assess a flexible manual tool intended for home bakers and small-scale confectioners is described in full in the Cookies and Confectionery Hand Press Project methodology. This section offers a detailed explanation of the methods and strategies used to guarantee that the project's goals are accomplished accurately and successfully. The process starts with a thorough market study and literature evaluation to comprehend current products and find areas for innovation. This first stage establishes the framework for the development process and provides information for the design requirements. Following that, the project moves through phases of conceptual design, material selection, and prototype development, all of which are informed by ergonomic and engineering concepts.

3.2 FLOW CHART

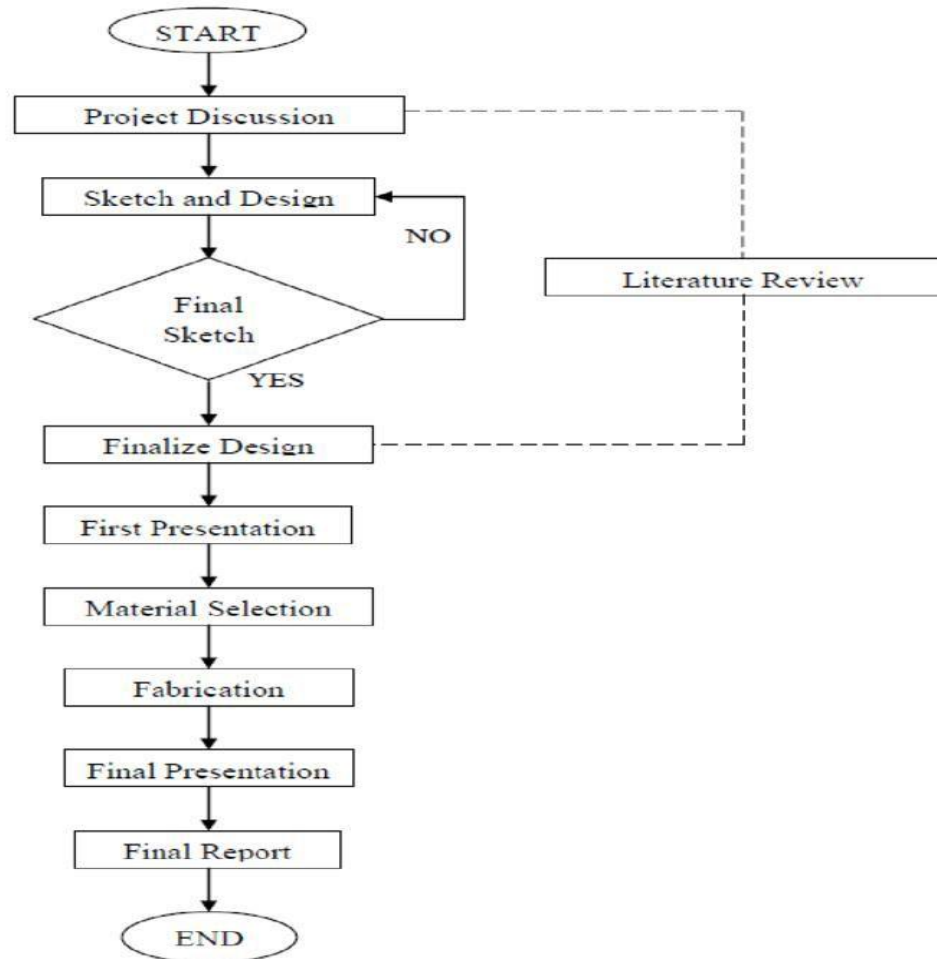


Figure 2.0 Flow Chart

3.3 MARKET SURVEY/FEEDBACK

During the process of collecting data and information for our project, we conducted an online survey via Google Form. The survey received responses from (ISI JUMLAH RESPONDAN) persons, including lecturer and students from Politeknik Banting Selangor. We value our customers opinions and the information we got from the customers regarding their interaction with product similar to ours. Their feedback helped us into adapting with their opinions and used them as our advantage and improve for the better.

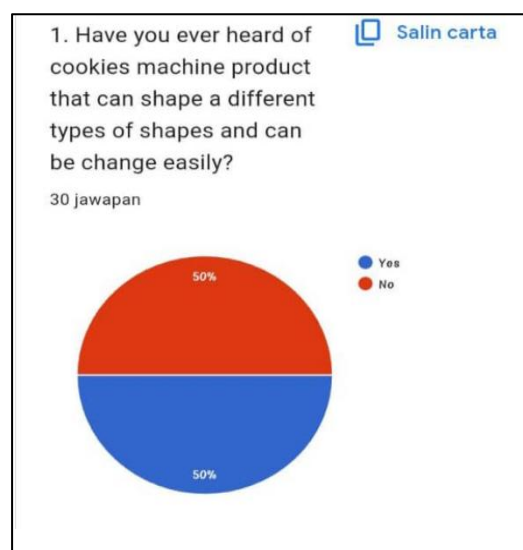


Figure 2.1 Percentages of people that have heard of cookies machine product That can shape a different types of shapes and can be change easily

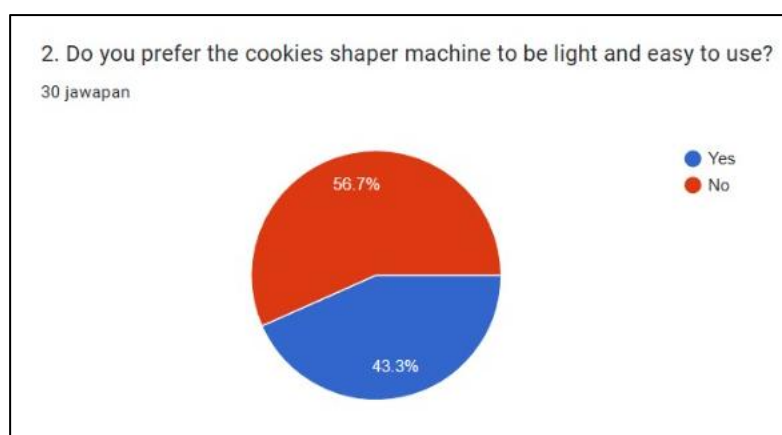


Figure 2.2 Percentages of people that preferred the cookies shaper machine to be light and easy to use

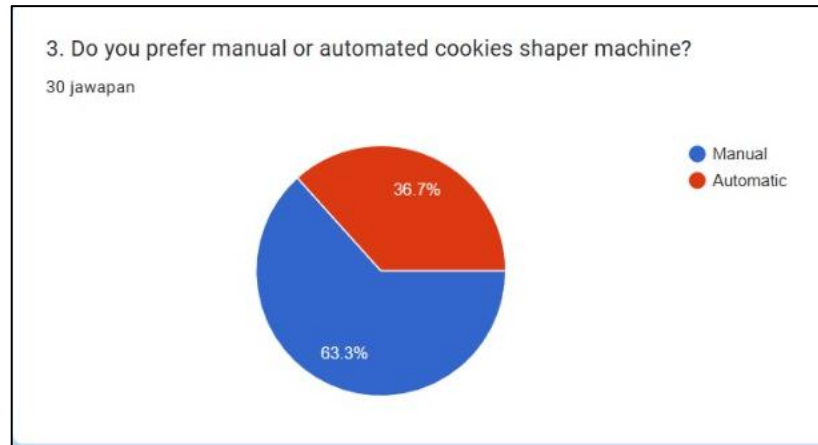


Figure 2.3 Percentages of people that preferred manual or automated cookies Shaper machine

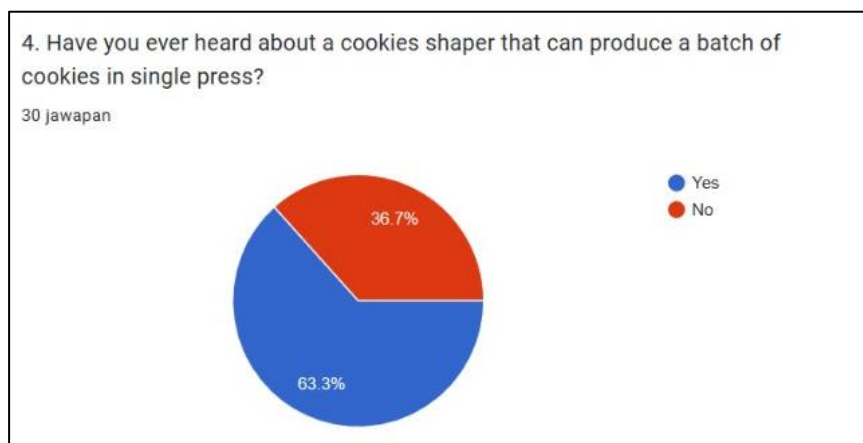


Figure 2.4 Percentages of people that heard about a cookies shaper that can produce a batch of cookies in single press

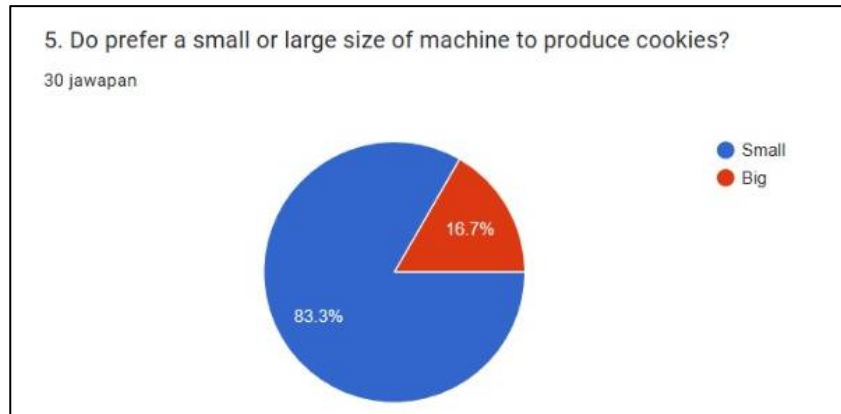


Figure2.5 Percentages of people that preferred a small or large size of Machine to produce cookies

Our survey revealed that all 30 respondents desired a smaller cookie shaper machine that is user-friendly and doesn't require special instructions. They expressed a preference for a machine that can produce a batch of cookies at once to enhance productivity. The majority favored a manual machine due to its cleanliness and safety, along with a lighter design for easier mobility. Taking this feedback into account, we have decided to develop our own cookie shaper machine that is efficient, easy to use, portable, and capable of making multiple cookies at once, ensuring it remains affordable for everyone.

3.4 PRODUCT DESIGN PROCESS

After discussing the problems and some researches about the project, we decided to do the next process, which is the process of designing the product. There are a few steps of designing the product before we finalized the design following the requirement and specification we have set according to the results of our previous studies. Here are some sketches of ideas before we move on to the next step.

3.4.1 SKETCH IDEA/ IDEA PURPOSED

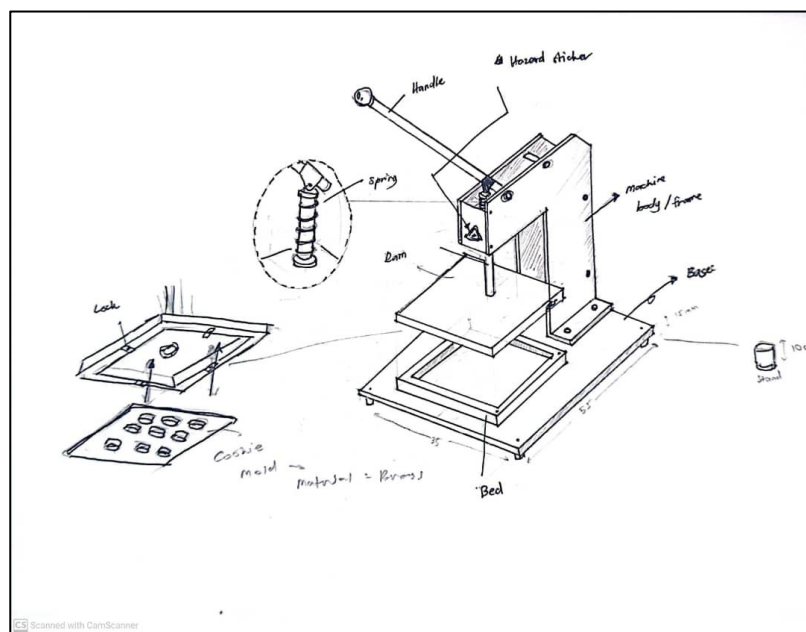


Figure 2.6 Idea Sketch 1

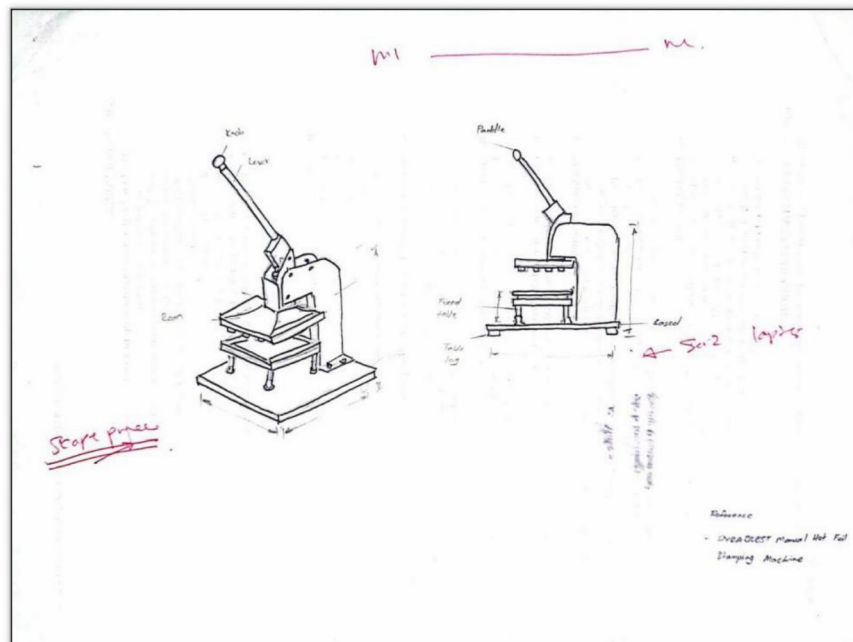


Figure 2.7 Idea Sketch 2

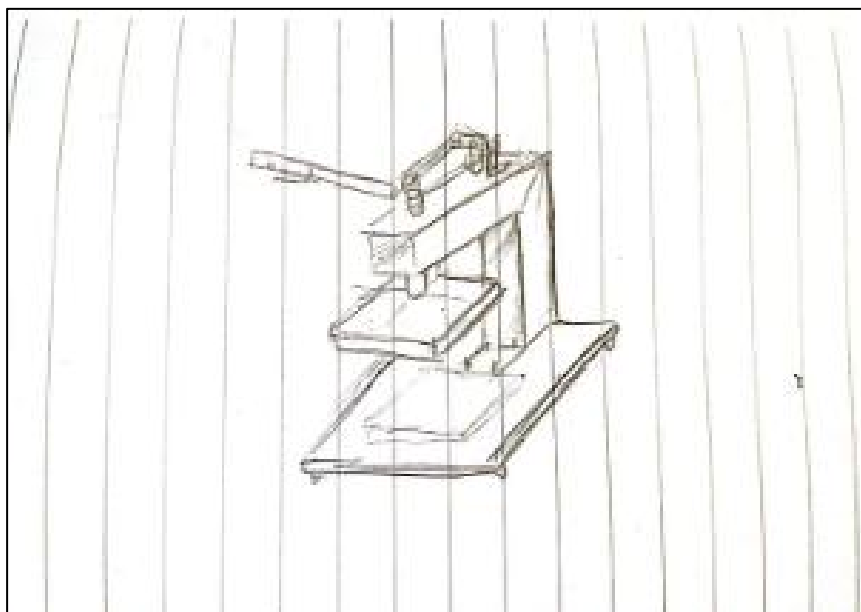


Figure 2.9 Idea Sketch 3

3.4.2 SELECTED IDEA PURPOSED/SKETCH IDEA

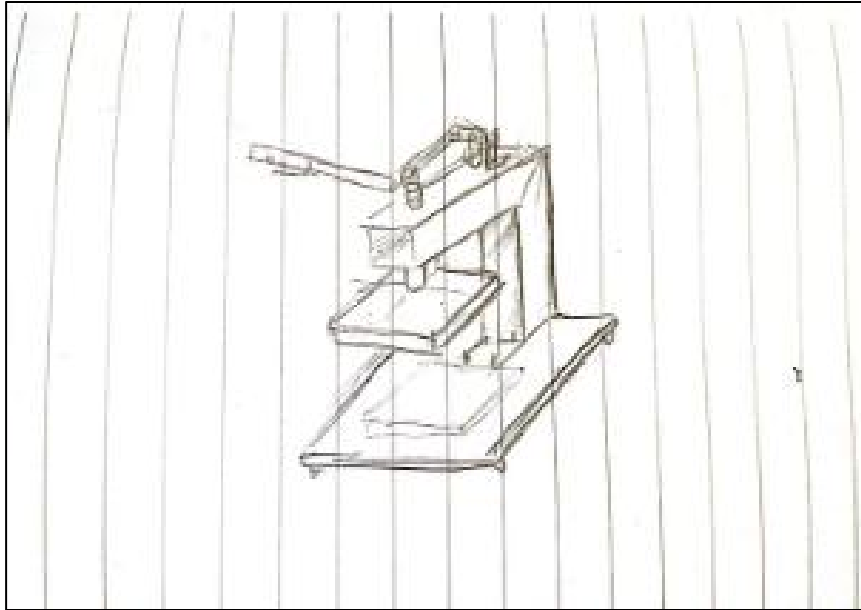


Figure 3.0 Final Selected Sketch Idea

After discussing with the group members, we decided to choose sketch idea 3 as the final product design based on the features that we analyzed, which is :

- The column or stand of the product is more secure, smaller and easier to build compared to other sketch ideas.
- More simpler design and easier to build the product.
- more proper pressing mechanism.

3.4.3 DETAILED DESIGN

For the next step, we finalize and made some improvements of our final sketch idea by using Autodesk Inventor software. The following are some product drawings according to ISO drawing along with dimension measurements.

3.4.3.1 FINAL DESIGN

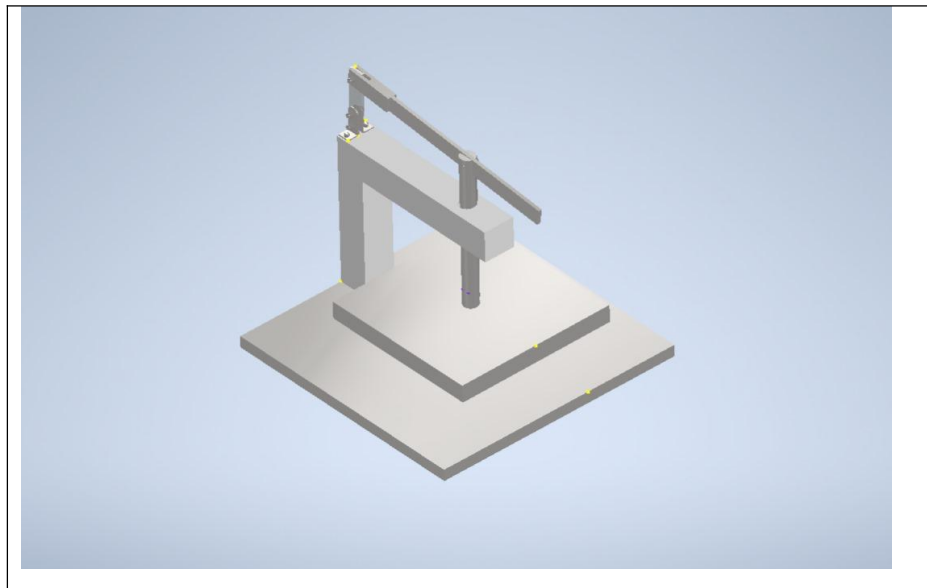


Figure 3.1 Final Design by using Autodesk Inventor software

3.4.3.2 CAD DRAWING

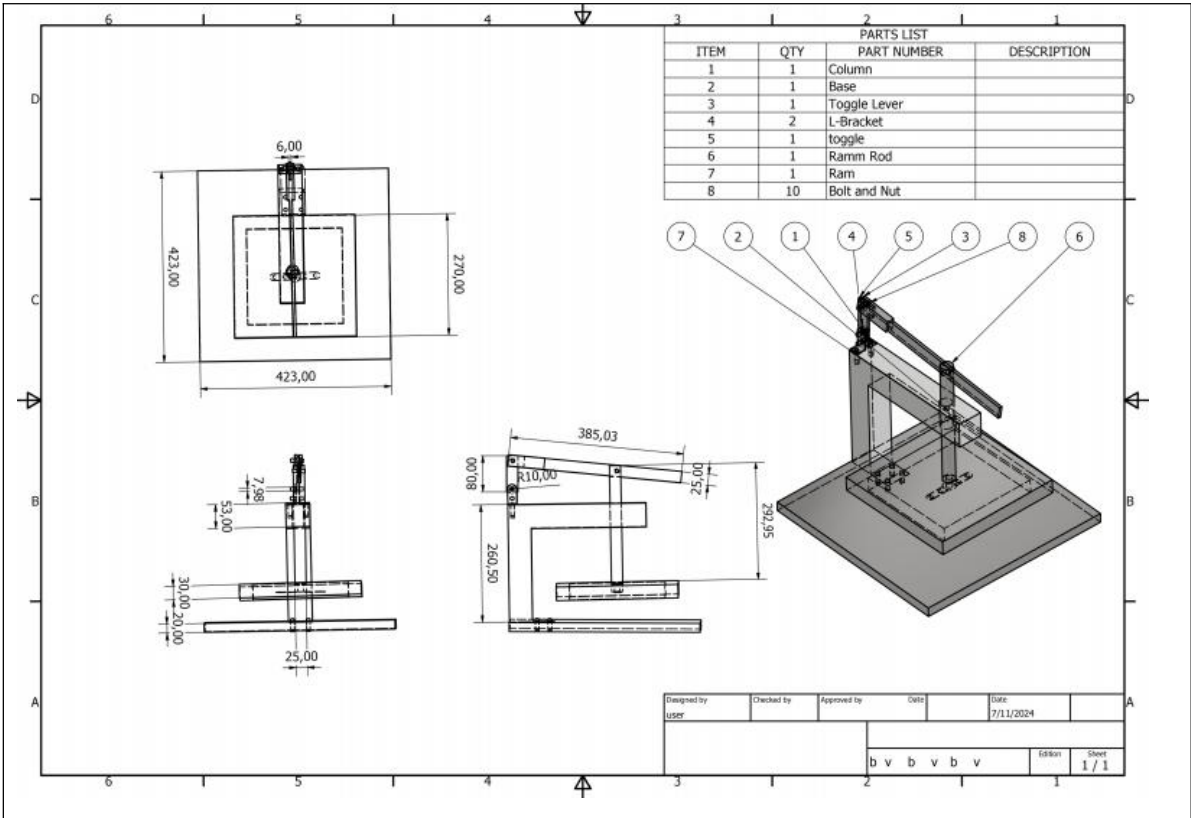


Figure 3.2 CAD drawing of the final design following the ISO drawing by using Autodesk Inventor software

3.5 MATERIAL SELECTION

Based on figure 3 describe about the material selections for our product after some discussion and studies .

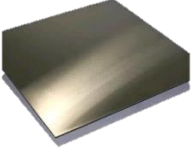
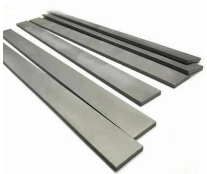




COMPONENT/PART	MATERIAL	FUNCTION	EXAMPLE
SHEET PLATE (BASE)	SUS304 STAINLESS STEEL 0.5 MM	<ul style="list-style-type: none"> • Provide a stable foundation for the product • has excellent corrosion resistance and non-toxic 	
FLAT BAR (HANDLE LEVER/TOGGLE BAR)	MILD STEEL (3MM X 15-32MM)	<ul style="list-style-type: none"> • To push the ram • High strength-to-weight, ratio, light and strong 	
COOKIE MOULD	STAINLESS STEEL	<ul style="list-style-type: none"> • a tool to cut biscuits/cookies dough into a particular shape • Corrosion resistance 	
SHEET PLATE (RAM)	SUS304 STAINLESS STEEL 0.5 MM	<ul style="list-style-type: none"> • referred to as the food grade because of its increased anti-corrosion properties. 	
HEX SOCKET CAP HEAD SCREW	STAINLESS STEEL	<ul style="list-style-type: none"> • two primary functions of a screw are to hold things together or to lift object • protect against the unintentional stripping of fasteners. 	
SPRING	STAINLESS STEEL	<ul style="list-style-type: none"> • Cushioning, absorbing, or controlling energy due to shock and vibration. 	

Figure 3.3 Material Selection table










L BRACKET	STAINLESS STEEL	<ul style="list-style-type: none"> To hold & secure the cookie tray from falling Simple lock and easy to plug-out 	
SCREW AND NUT	STAINLESS STEEL	<ul style="list-style-type: none"> To secure, hold and are screwed into the part or components of the product to be fastened. 	
LEVER/TOGGLE GRIP	RUBBER	<ul style="list-style-type: none"> allow the fingers to grip objects and cover the lever/ toggle bar. 	
SQUARE HOLLOW PIPE (STAND/COLUMN)	STAINLESS STEEL	<ul style="list-style-type: none"> Work as a holder of the ram and lever . 	
ANTI-SLIP PAD (BASE BOTTOM PAD)	RUBBER	<ul style="list-style-type: none"> Work as a anti-slip padding to the base to prevent sliding on smooth surfaces. 	

Figure 3.4 Material Selection table

3.6 MACHINES & TOOLS EQUIPMENT

Here the list of machines and tools equipment that we will use during in completing our project based on Figure ...

No.	EQUIPMENTS	PURPOSES
1.	<p>TIG Welding Machine</p> 	To to join two or more metal materials together using heat, pressure, or both, to create a strong, durable, and permanent connection
2.	 <p>Measuring Tape</p>	To to measure length of material or finished product following the desired measurements.
3.	 <p>Hand Grinder</p>	Used to cutting, grinding and polishing the materials depends on the desired shape or measurements.
4.	<p>Hand Drilling Machine</p> 	Used to fabricate holes in multiple materials. They are widely used in construction, carpentry, metalworking, assembly, and maintenance.





5.	 <p>Aviation snip cutter</p>	Used to cut soft and thin materials, particularly sheet metal.
6.	 <p>G Clamp</p>	used to hold a wood or metal workpiece.
7.	 <p>Desk-stop drilling machine</p>	to create a circular hole. In this, a tool is used to drill holes of varying sizes and other operations called a drill bit.
8.	 <p>Vernier Caliper</p>	Used to measure the diameter of circular objects. The circular jaws of the vernier caliper fit perfectly on the circumference of round objects. , and a moving vernier scale.

Figure 3.5 Machines & Tools equipment

3.7 FABRICATION PROCESS

Here's a table summarizing the fabrication process of the Cookies & Confectionery Hand Press Machine.

FABRICATION ACTIVITIES	DESCRIPTION	EQUIPMENT/TOOL USED
MEASURING AND MARKING	Measuring dimensions of materials, marking precise lengths on aluminum and stainless steel components	Measuring Tape, Stainless Steel Marker
CUTTING	Cutting aluminum plates and other materials to required dimensions that has been discussed.	aviation snip cutter hand grinder
WELDING	Using TIG and MIG welding to join metal parts and components such as column or base.	TIG and MIG Welding Machine
DRILLING	Creating holes for screw for tighten or locks on the parts or other component.	Hand Drilling Machine, Desk-stop drilling machine
SURFACE GRINDING	Smoothing and finishing surfaces to improve flatness, ensuring a consistent and polished finish	hand grinder

Figure 3.6 Fabrication Process

3.8 GANTT CHART

This diagram above shows the Gantt Chart for all our activities that we managed from Week 1-Week 14 for Project 1 Session II 2023/2024.

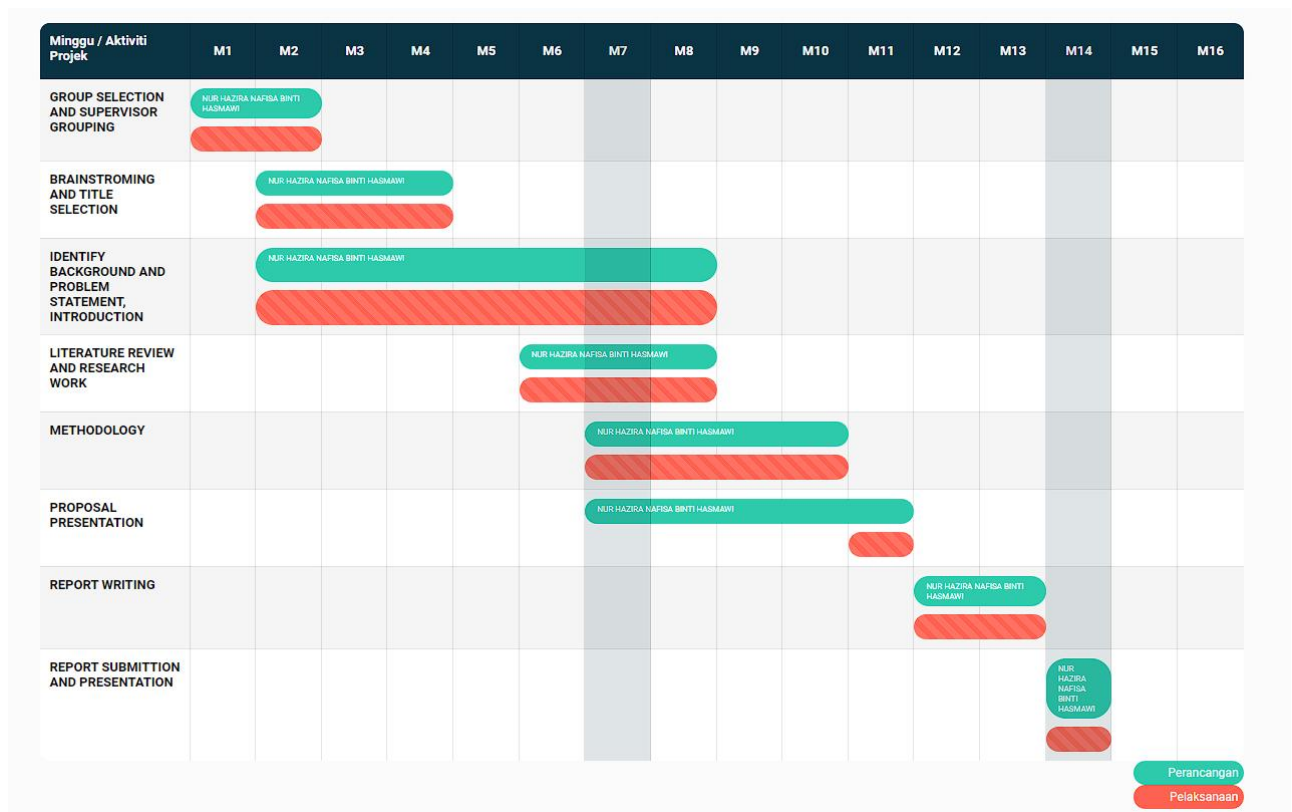


Figure 3.7 Gantt Chart for Project 1 Session II 2023/2024

This diagram above shows the Gantt Chart for all our activities that we managed from Week 1-Week 14 for Project 2 Session I 2024/2025

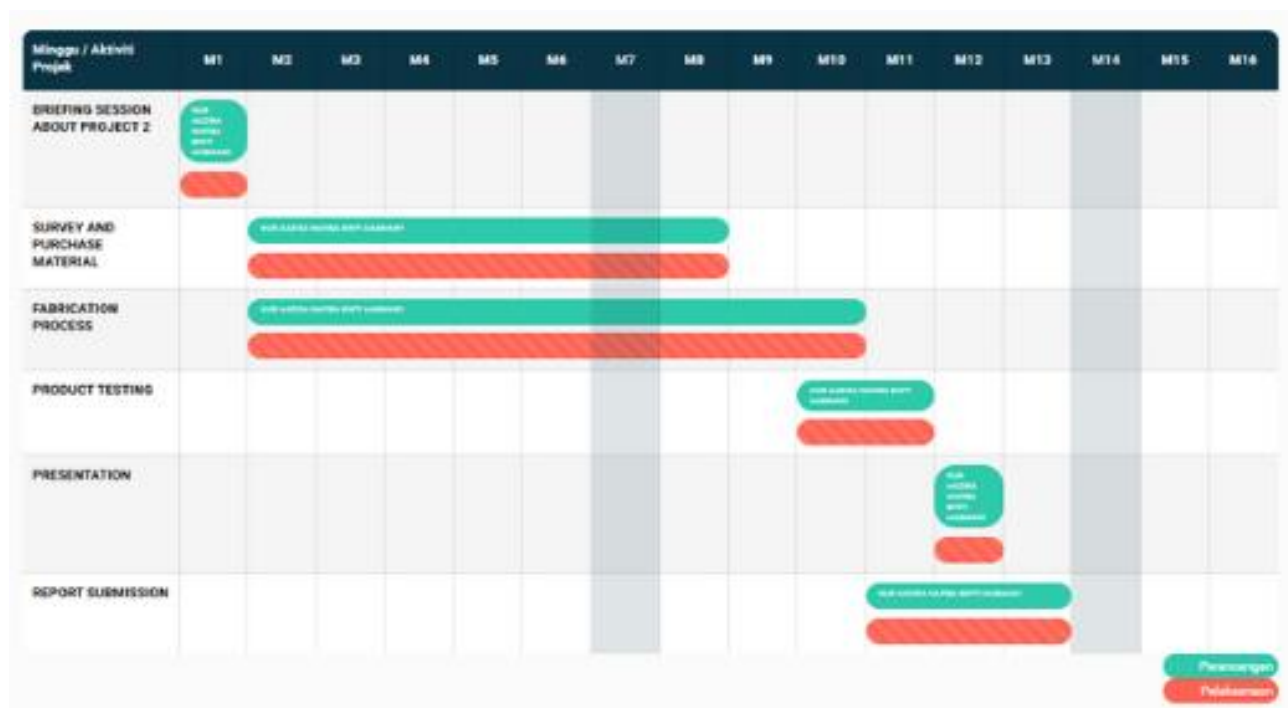


Figure 3.8 Gantt Chart for Project 2 Session I 2024/2025

3.9 CONCLUSION

In conclusion, we wanted to investigate the ideal parameters for reaching desired texture and quality in pressed confectionery items using a mix of literature review, experimental design, and data analysis. We carried out a number of studies using cutting-edge machinery and industry-standard practices to look at how factors like temperature, pressure, and ingredient composition affect the final product. Even though we ran across difficulties with ingredient sourcing and machine calibration, we overcame them with careful planning and assistance from industry professionals. Through strict adherence to methodology, we have improved cookie and confectionery processing procedures and established a strong basis for future study in this area.

CHAPTER 4: METHODOLOGY

4.1 INTRODUCTION

This chapter discusses about the data obtained from our project which is cookies and confectionery hand presser that is suitable for environment. Our objectives are to make a machine that is affordable and low cost for small industries, to make them easy for customers to handle and use it and also to make the production process become more efficient and effective.

The described machine represents the development and test processes of a hand presser for cookies and confectioneries with the purpose of simplifying the production of small batches of cookies and sweets. This machine would be designed with the user in mind and ensure that the shapes would be regular, since this process would be aided by construction to prevent accidents to the user. That is why it will be particularly useful in home baking and small-scale establishments of confectionery.

To test the machine, we observed whether or not it was easy to use, that the cookies and sweets produced were of a uniform level, and how much dough it could handle. We tested its strength to ensure that it would last a long time while serving.

The results have been outstanding, creating quality products with less effort. Its simple design and safety features make this an excellent tool to work with to boost productivity and also ensure users' safety while in the kitchen.

4.2 PROCESS OF FABRICATING THE PRODUCT

The following is the fabrication process of the actual product for each part or component. For this process, there are several operations that occur in completing this project :

4.2.1 THE PROCESS OF BUILDING : RAM

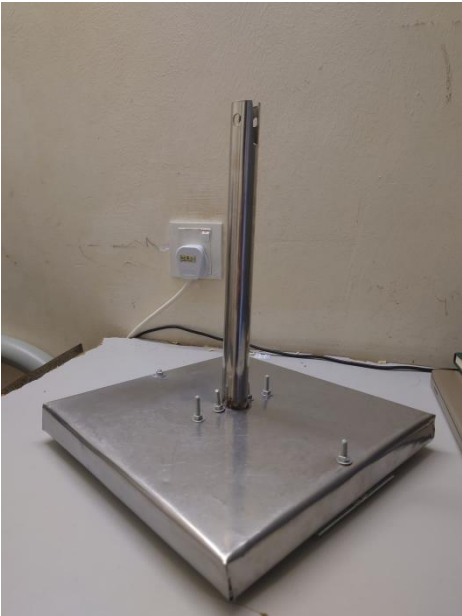




TYPE OF PART/COMPONENT	TASK/ACTIVITY	FIGURE
RAM 	1. We used aviation snip cutter to cut the metal sheet according to the shape we planned.	
	2. We then used Steel Cutter Machine to cut the metal steel into desired shapes.	
	3. We used MIG welding machine to connect the joint of the metal steel into 'Ram' shape which is rectangular shape.	
	4. We folded the metal sheet that been shaped into what we planned around the 'Ram' to cover them up.	

Figure 3.9 The process of building ram

4.2.2 THE PROCESS OF BUILDING : BASE






TYPE OF PART/COMPONENT	TASK/ACTIVITY	FIGURE
BASE 	5. We are measured the stainless steel plate following the desired shape.	
	6. We used aviation snip cutter to cut the metal sheet into our desired shapes for the base which is rectangular shape.	
	7. We used the wood cutting machine to cut the wood into rectangular shape for our base.	
	8. We folded the metal sheet around the wood using hammer and rubber hammer to make them into our base.	

Figure 4.0 The process of building base

4.2.3 THE PROCESS OF BUILDING : STAND/COLUMN






TYPE OF PART/COMPONENT	TASK/ACTIVITY	FIGURE
STAND/COLUMN 	9. We used the hand cutter machine to cut a hollow bar steel into the desired shape.	
	10. We joined the hollow metal bar steel using the TIG welding machine to connect the joints properly.	
	11. We used hand grinding machine to clean the surface of the welded joints and the sharp edges.	
	12. We drilled the hollow bar steel to make a hole as large as 25 mm diameter by using bench drilling machine.	

Figure 4.1 The process of building stand/column

4.2.4 THE PROCESS OF BUILDING : TOGGLE LEVER






TYPE OF PART/COMPONENT	TASK/ACTIVITY	FIGURE
LEVER 	13. We used hand cutter machine to cut the metal steel to the length we need and using the grinding machine to clear the edges.	
	14. We used the drilling machine to make a hole on it to connect with the ram and the stand.	
	15. We used hand drill machine to drill the lever .	
	16. We used MIG welding machine to joint the metal steel into the lever shape and joint we need to make the hollow rod moves when we pressed them.	

Figure 4.2 The process of building toggle lever

4.3 PROJECT FINDINGS

This chapter presents the different testing of samples to gauge which one is the most efficient and will be manufactured for Cookies and Confectionery Hand Presser. The tests were conducted regarding how the machine operates in every sense on how it will be user-friendly, the consistency of its product, and the durability of the machine. The details all the experiments conducted on the Hand Presser Machine to point out important findings of the said tests.

4.3.1 THE PRODUCTION OF COOKIES AND CONFECTIONARY HAND PRESS

PART	RAW MATERIAL
Base	Stainless steel 304 & Wood
Ram	Stainless steel 304
Cookies Mold	Aluminium
Handle lever bar	Stainless steel 304
Spring	Stainless steel
Hex socket cap head screw	Stainless steel
Square hollow stainless steel	Stainless steel 304

Figure 4.3 Part and Their Raw Material

4.3.2 MATERIALS AND THEIR MEASUREMENTS

These are the measurements of each parts or components of the products.

NO.	PARTS/COMPONENTS	LENGTH (CM)	WIDTH (CM)	HEIGHT (CM)
1.	Base	42.5	37.0	2.0
2.	Ram	27.0	26.0	3.0
3.	Ram Rod	25.0	25.0	27.0
4.	Toggle lever bar	39.0	1.5	2.5
5.	Cookies Mould	14.5	17.5	4.0
6.	Column/stand	30.5	5.0	25.5

Figure 4.4 Materials And Their Measurements


4.3.3 EXPERIMENT DETAILS

For this process, there are several aspects that need to play an important role in order to produce a quality product in addition to fulfill the criteria set as a complete and well-functioning product.

4.3.4 PRODUCT TESTING

There several testing has been made to our product to evaluate several aspects in terms of durability, safety and other aspects.

4.3.4.1 MECHANISM/MOVEMENT TESTING

OBJECTIVE	TESTING METHOD	DEMONSTRATION
To determine operational simplicity and user-friendliness	User operates the hand press for set duration	 <p>Figure The user is demonstrating the movement of ram</p>

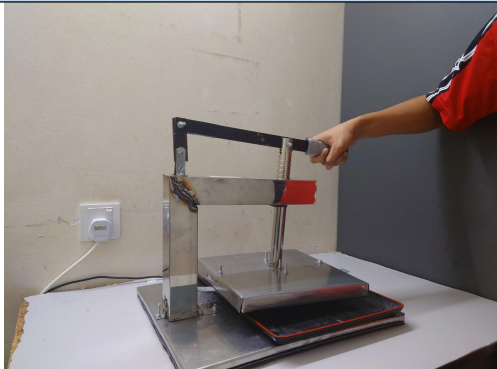

RESULT	
	Can operate the movement smoothly without using much energy

Figure 4.5 Mechanism/Movement Testing

4.3.4.2 ASSEMBLY/DISASSEMBLY TEST

OBJECTIVE	TESTING METHOD	DEMONSTRATION
Evaluate how easy it is to assemble or disassemble for maintenance.	Time is set during the operation of assembly/ disassembly the product	 <p>Figure The user is unscrewing the components of the product while time is recorded.</p>


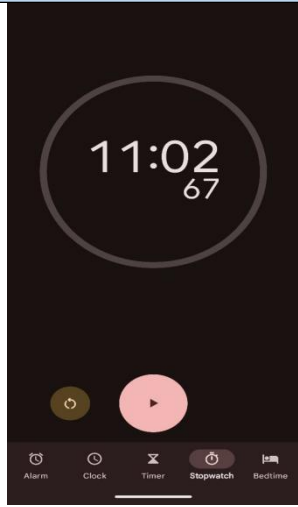
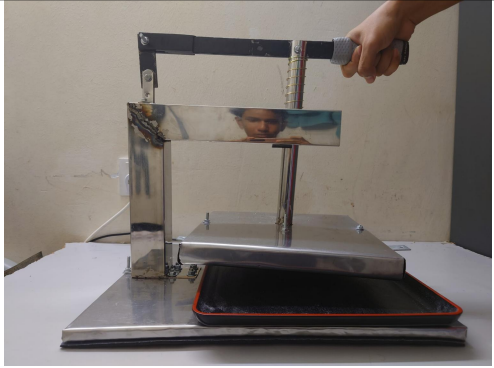
RESULT	
 <p>Figure Use special tool like spanner to disassemble the product</p>	 <p>Time recorded result: 11.02 minutes</p>

Figure 4.6 Assembly/Disassembly Test

4.3.4.3 STABILITY TEST

OBJECTIVE	TESTING METHOD	DEMONSTRATION
Check if the base remains stable during operation.	Apply maximum force on the toggle lever and observe any movement in the base.	 <p>Figure The user is pressing the toggle using high force to check if the base move or slide during the operation.</p>

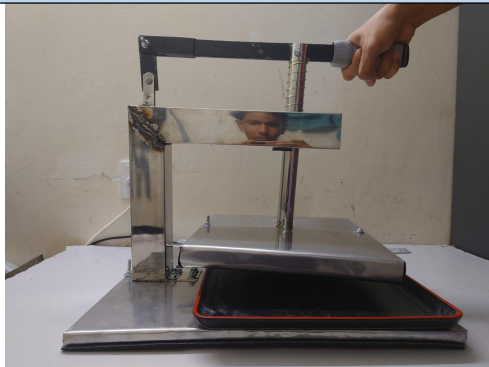
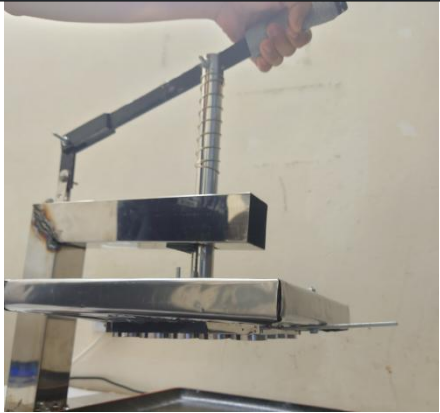
RESULT	
	

Figure 4.7 Stability Test

4.3.4.4 SAFETY TEST

OBJECTIVE	TESTING METHOD	DEMONSTRATION
To ensure safety features prevent injuries during pressing operation.	Observe any safety features whenever provide or vise-versa.	 <p>Figure The user is observing for any safety features provide on the product.</p>


RESULT
 <p>Figure Only warning label is provided</p>

Figure 4.8 Safety Test

4.3.3 DETAILS PROJECT ANALYSIS DATA

TEST CATEGORY	TESTING OBJECTIVE	EXPECTED OUTCOME	METHODOLOGY/ PROCEDURES	OBSERVATION	RESULT
Mechanism/Movement Testing	To determine operational simplicity and user-friendliness	Smooth operation with minimal energy	Time is set during the operation of assembly/ disassembly the product	Can operate the movement smoothly without using much energy	✓
Assembly/Diassembly Test	Evaluate how easy it is to assemble or disassemble for maintenance.	Should be simple,less time required to assemble and tool-free.	Time is set during the operation of assembly/ disassembly the product	Assembly took around 10 minute and required specific tool.	✓
Stability Test	Check if the base remains stable during operation.	Base should remains stable without sliding or moving.	Apply maximum force on the toggle lever and observe any movement in the base.	Base is fixed to the position without any movement.	✓
Safety Test	To ensure safety features prevent injuries during pressing operation.	Safety features should prevent accidental injuries.	Observe any safety features whenever provide or vise-versa.	Only have warning label and no safety guard provided.	✗

Figure 4.9 Project Analysis Data

4.4 ANALYSIS COST

Cost of our analysis on the materials that we used for our project in the purchasing cost.

NO.	COMPONENT	PRICE (RM/UNIT)	THE QUANTITY REQUIRED	TOTAL PRICE (RM)
1.	SUS304 Stainless Steel Sheet Metal	RM 55.00	1	RM55.00
2.	Anti-slip Base Mat	RM 18.00	1	RM 18.00
3.	L-bracket	RM 0.50	5	RM 3.00
4.	Screw & nut	RM 0.50	16	RM 8.00
5.	Straight Bracket	RM2.20	2	RM 4.40
6.	Acrylic Adversive Tape	RM 4.30	1	RM 4.30
7.	Square Hollow Pipe	RM 26.50	1	RM 26.50
8.	Cookie Mould	RM 21.90	1	RM 21.90
9.	Spring	RM4.10	1	RM 4.10
10.	Toggle Grip	RM 11.90	1	RM 11.90
TOTAL				RM 157.10

Figure 5.0 Analysis Cost Table

4.5 SAFETY RISK

This is how we are preventing our project from any harm and risk to the customers and their environment.

RISK	HOW TO PREVENT
Pinched fingers	<ul style="list-style-type: none">• Be very careful not to have your fingers caught in the machine while pressing dough.
Sharp Parts	<ul style="list-style-type: none">• Any sharp edge or blade that may exist could cut an operator when in use or at time of cleaning.
Machine Malfunction	<ul style="list-style-type: none">• Application of undue force to an already broken and jammed machine is harmful.

Figure 5.1 Safety Risk Table

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

In conclusion, our project presents a valuable solution for small cookies and confectionery businesses. By offering an affordable, time saving, and energy efficient machine, we are tackling the challenges these businesses encounter, such as high costs and the complexity of equipment typically found in larger operations. Our project empowers small-scale cookies and confectionery makers to improve their production efficiency without the strain of significant financial investments, making it a practical and cost-effective tool for their growth.

To ensure the long-term success and expansion of our project, we need to concentrate on a few key strategies. First, conducting live demonstrations and collecting testimonials from local cookies and confectionery makers can effectively showcase the machine's benefits and build trust with potential customers. Collaborating with small bakeries or home-based cookies and confectionery makers to test and promote the product will also enhance credibility and encourage word-of-mouth marketing. Additionally, hosting workshops or providing tutorials on how to operate the machine will add value by assisting customers in maximizing their use of our product.

Moreover, targeted marketing efforts directed at small business owners through suitable channels will guarantee that our product reaches those who need it most. Finally, delivering excellent after-sales support and customer service will help forge strong relationships with our clients, fostering customer loyalty and positive reviews.

Ultimately, our project has the potential to significantly impact the small cookies and confectionery industry, offering an efficient, affordable, and accessible solution that can help these businesses flourish. With the right strategies in place, our project can successfully grow and provide lasting benefits to small cookies and confectionery makers everywhere.

5.2 RECOMMENDATIONS

1.Ergonomic Design:

Provide a handle and pressing mechanism that promote ease of use to prevent hand and wrist fatigue during prolonged use.

2.Safety Features:

Provide additional shields or barrier's to prevent user from unsafe areas of the machine such as moving or cutting blades.

3.Compact and Portable:

Configure the machine in such a way that it is lightweight and easy to pack for a homely worker who has limited kitchen facilities.

5.3 REFERENCES

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