DJJ50193: PROJECT 2

PROPOSAL

(FLASH CUTTER)

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This report is submitted to the Department of Mechanical Engineering in partial fulfilment of the requirements for Diploma in Mechanical Engineering

MECHANICAL ENGINEERING DEPARTMENT

SESSION 1: 2021/2022

DECLARATION OF ORIGINAL WORK AND INTELLECTUAL PROPERTIES

TITLE: FLASH CUTTER

SESSION: 1:2021/ 2022

1. WE : **1) MUHAMMAD HAYKAL BIN HALID**

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I, is a final year student **in Diploma in Mechanical Engineering, Mechanical Engineering Department, Politeknik Sultan Salahuddin Abdul Aziz Shah, of Persiaran Usahawan, 40150 Shah Alam, Selangor.** (Hereafter referred to as "the Polytechnic").

2. I acknowledge that the 'Project above' and its intellectual property are the original work/copy of our work without taking or imitating any intellectual property from others.

3. I agree to give up the intellectual property ownership of 'The Project' to the Polytechnic in order to meet the requirements for awarding us **Diploma in Mechanical Engineering**.

Made and truly recognized by:)

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At the **PSA MECHANICAL ENGINEERING DEPARTMENT** on **3/5/2021**

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Grateful to Allah S.W.T and a support from our supervisor, Puan Zetty Rohaiza binti Mohd Sahak @ Ishak and Dr. Mohd Elias bin Daud. We are able to finish our final project 'FLASH CUTTER'. This project was created to give benefits to all users and hope that this project and make their life easier.

Without the cooperation of all parties, especially Polytechnic Sultan Salahuddin Abdul Aziz Shah and our supervisor, we believe that this project and final report cannot be completed properly without the aid of the party. Moreover, it is a testimony of our project and our careers in the future.

After a year from semester 4 to semester 5, a project was implemented for students who have successfully designed to be used as experience in making projects and gained as much knowledge as possible to make it easier for students when out as graduates later.

During the process of making this project, probably there is a lot of mistakes are made without us realizing it was a mistake. Therefore, we seek for forgiveness and thousands of grateful to the Polytechnic Sultan Salahuddin Abdul Aziz Shah and our supervisor. Also, all the staff whether involved or not. A lot of guidance and cooperation for our project.

Lastly, we hope from this final project report can meet all requirement set out in addition to one of the conditions in the award-Polytechnic Polytechnic diploma for Malaysian. Thank you.

ABSTRACT

This Flash Cutter project is a tool used for the circumcision process for men which is operated by tok mudim and doctors who have expertise in circumcision. Circumcision means removing excess skin on the genitals for men. The circumcision process is usually done using tools such as Clamp, Cautery and a sharp knife to remove excess skin but there are some risks such as heavy bleeding, long healing period and quite expensive for a cauter tool(4). Therefore, the development of this Flash Cutter project is expected to be able to address existing problems. This device is made of 4 main components namely Stainless steel 316 wire, cooper rod, Dripper RDA Vape and Device Vape. The use of a vape device serves to supply electricity to generate thermal energy, while 316 Stainless Steel wire serves as a skin excess cutter. This tool can speed up the circumcision process and speed up the healing period of the genitals. Indirectly, this circumcision tool is able to facilitate the work done by doctors or tok mudim in the circumcision process. In fact, this Flash Cutter innovation is not directly related to any 'wireless' and is easy to control. Among the improvements made to the Flash Cutter is to add hot bending silicone to the cooper rod and also make a smaller design to further speed up the heating process and simplify the control of the Flash Cutter. In addition, the Flash Cutter is also equipped with a new cutter, the depth cutter, which allows for a neater cut of the skin. Therefore, the production of this Flash Cutter project is one of the alternatives for equipment that can perform the circumcision process better and meet the characteristics such as a simple process, safe and low cost compared to existing equipment.

Keywords: Tok Mudim, Doctor, Circumcision, Flash Cutter, Stainless Steel, cutting excess skin, genitals

ABSTRAK

Projek Flash Cutter ini merupakan satu peralatan yang digunakan untuk proses berkhatan bagi lelaki yang dikendalikan oleh tok mudim dan doktor yang mempunyai kepakaran dalam berkhatan. Berkhatan bermaksud membuang lebihan kulit pada alat sulit bagi lelaki. Proses berkhatan selalunya dilakukan dengan menggunakan alat seperti Clamp, Cautery dan pisau tajam untuk membuang lebihan kulit tetapi terdapat beberapa risiko seperti pendarahan banyak, tempoh penyembuhan yang lama dan agak mahal untuk alat kauter(4). Maka dengan itu, pembangunan projek Flash Cutter ini diharap mampu menangani masalah sedia ada. Alat ini diperbuat daripada 4 komponen utama iaitu Stainless steel 316 wire, cooper rod, Dripper RDA Vape dan Device Vape. Penggunaan peranti vape berfungsi untuk bekalan elektrik bagi menghasilkan tenaga haba, manakala wayar Stainless Steel 316 berfungsi sebagai pemotong lebihan kulit. Alat ini dapat mempercepatkan proses berkhatan dan mempercepatkan tempoh penyembuhan alat sulit. Secara tidak langsung alat berkhatan ini mampu memudahkan kerja yang dilakukan oleh doktor atau tok mudim dalam proses berkhatan. Malahan pula, inovasi Flash Cutter ini tidak berkait langsung dengan sebarang 'wireless' dan mudah dikawal. Antara penambahbaikan yang dibuat pada Flash Cutter adalah menambahkan hot bending silicone pada cooper rod dan juga membuat reka bentuk yang lebih kecil unntuk mempercepatkan lagi proses pemanasan dan memudahkan kawalan Flash Cutter. Selain itu, Flash Cutter juga dilengkapi oleh satu cutter baharu iaitu depth cutter yang membolehkan pemotongan kulit yang lebih rapi. Justeru itu, penghasilan projek Flash Cutter ini menjadi salah satu alternatif bagi peralatan yang dapat melakukan proses berkhatan dengan lebih baik dan memenuhi ciri-ciri seperti proses yang mudah, selamat dan kos yang murah berbanding peralatan yang sedia ada.

Keywords: Tok Mudim , Doktor , Berkhatan , Flash Cutter , Stainless Steel , memotong lebihan kulit , Alat Sulit

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CHAPTER 1: INTRODUCTION

1.1) Introduction

A lot of what we see, the way or tool of circumcision today is the result of its design, use, its own way of circumcision and many more. It costs a lot of money. This is one of the comfort features that is very much needed by doctors or circumcision experts nowadays, for example to speed up the circumcision process just by using this tool and does not cost a lot and can even be used independently without being tied to an electrical wire connection on socket.

Therefore, this study suggests the application of electrical energy to thermal energy as a tool to heat the cutting wire. In fact, the cost used is also low compared to the current circumcision machines. It is very easy to use, lightweight, and safe to use.

So we chose this problem to be solved by creating a tool that could solve the problem that had been stated to meet our final universe student project. We will use all the knowledge and knowledge that we have learned during our time at the Sultan Salahuddin Abdul Aziz Shah Polytechnic to make this project a success. It is hoped that the project we are implementing will succeed in achieving the intended objectives and get excellent marks.

1.2) Problem Statement

The Conventional method that is often used when circumcising is the Freehand Technique where in this technique the skin is cut using scissors or a knife [2]. Conventional methods make it easier for bleeding to occur because cutting with scissors or a knife and bleeding during circumcision cannot be controlled. Bleeding should be stopped by using the "Ligation" Technique, which is tied or stitched with thread to stop the bleeding.

Also, the healing process after circumcision in this conventional way will take quite a bit longer. This causes the circumcised patient to have to abstain for a long time. Circumcised patients also need to limit their movement for a long time while waiting for their genitals to be properly recovered and fully healthy.

Next, this conventional circumcision process takes quite a long time approximately 40 minutes - 60 minutes for a circumcised patient [3]. This caused other circumcision patients to have to wait a long time until it was their turn to be circumcised. Circumcision doctors also had to limit the number of circumcised patients per day.

Therefore, a modern circumcision device design is needed to control bleeding during circumcision, faster healing process after circumcision and speed up the time during the circumcision process. Indirectly can guarantee the well being and user friendliness.

1.3) Research Objective

The objective of our study is to design and size a Flash Cutter that uses heat energy (heat transfer) to heat the cutting wire to be used for circumcision [1]. The following is a list of some of the objectives involved:-

- To design a Flash Cutter circumcision tool
- To develop a Flash Cutter model
- To analysis Flash Cutter product testing to ensure its functionality

1.4) Scope & Limitation

- The recommended maximum wattage is not more than 60 watts
- The battery of this device need to charge
- Could last for a long time with a good care.
- This product could not be exposed to water.

1.5) Research Gap

- Is it possible removal of the foreskin from the human penis by using flash cutter?
- What type of material that used to build the cutter?

1.6) Significance of Study

This research is very much needed in fabricating this Flash Cutter project to find out the shortcomings which is on the traditional circumcision method to create objectives in this pro- filler project. In addition that, also this research is a reference for preparing reports and journals for this project with how to search on websites or books that have something to do with this Flash Cutter project. Therefore, research is very important in this project and can provide something new such as:

i. Able to enhance creative and innovative thinking in projects
ii. Knowledge that can be applied for the future
iii. Able to find the best solution for problems that arise

1.7) Chapter's Summary

In this chapter, the studies was explained about its origin of ideas and inspirations. All the objectives were made out of all the problem statements. The objective for this project along with the importance will that will be comfortable and light causing it to be more convenient for and even the scope of this project only. Thus, this new device of circumcision could be used for circumcision physician to circumcision their patient with a really good care for a longer lifetime.

CHAPTER 2: LITERATURE REVIEW

2.1) Introduction

Before starting a project, a detailed study needs to be done so that did not experience any problems while doing this project. Therefore, from this study weaknesses as well as advantages of this project to be innovated. This situation allows careful search in solving any problems that arise.

With this study, the project can be implemented according to the set time because every problem will be able to be solved correctly and accurately. Several studies have implemented to see the project with the supervisor and discuss what is the problem of old circumcision tools and try to improve it in this project.

There are some problems that need to be solved to satisfy the users or supervisor which to improve this project. The old circumcision tools need to innovate but still using the same skill to circumcision. We are using the vape as the main component in our project because it is easier to carry and can be use anywhere and anytime.

2.2) Existing Concept

This method is the latest way in the world of circumcision. The technological shift is indirectly from the electrocautery method in which the difference of this tool is to use a very fine piece of metal and stretch it so that it looks like a thread. The metal is then heated slightly using a battery. This is intended, to kill bacteria that may still be on the side to make cutting easier. Since this gadget uses batteries, this gadget is easier to carry [1]. Tok Mudim who has this tool can perform the circumcision process at the patient's house until it is completed.

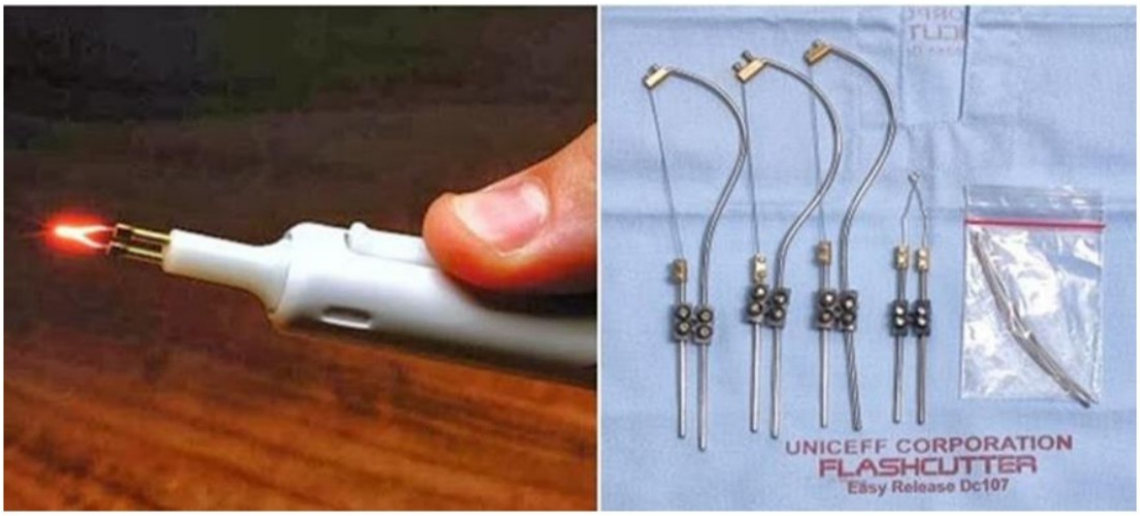

Figure 2.1 shows a diagram of the existing concept applied to the flash cutter.

2.2.1) Concept 1

This gadget is using the same concept as a diathermy machine which is uses high-frequency electric current to produce heat deep inside a targeted tissue. The diathermy machine does not apply heat directly to the body. Instead, the waves generated by the machine allow the body to generate heat from within the targeted tissue [1].

Diathermy is usually part of a complete physical therapy or rehabilitative regimen. Frequency and length of treatments vary.

The heat can help with various processes, including:

- Increasing blood flow
- Relieving pain
- Improving the mobility of tissues as they heal

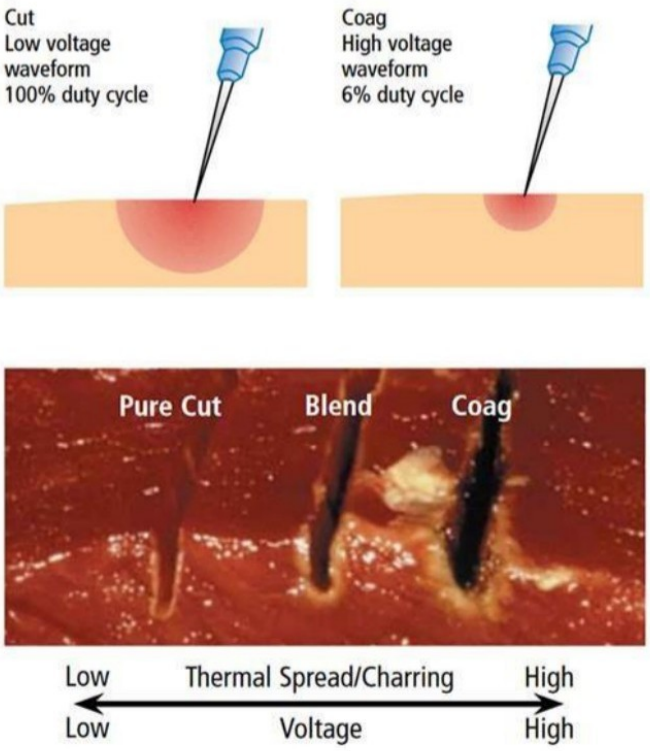

Figure 2.2 shows the cutting effect using a diathermy cutter based on different voltages

2.2.2) Concept 2

In laser circumcision, a laser device is used to cut the skin. The advantages are early recovery and minimal blood loss. The cuts on the skin are more accurate than conventional methods of doing circumcision. Sutures dissolve automatically within a few days. The dressing required is minimum. Number of follow-up required is minimum. This is by far the most modern method of treatment available for circumcision.

There are no obvious side effects of the procedure. However, on has t accept that like any other surgery, circumcision also involves complications related to the procedure.

Figure 2.3 shows a laser cutting tool machine

2.3) Research of Circumcision Method

In general circumcision is done among two main age groups; it is either during the newborn period, in which case is called '*Neonatal Circumcision'* or when the child reaches the age of around 7-12 years. Circumcision is also sometimes done as an additional procedure during surgery such as during a hernia operation [13].

There are 2 methods of circumcision. First in freehand method and the second one is clamp method. We focus on freehand method, that is dorsal slit method and guillotine method.

2.3.1) Dorsal Slit Method

The procedure of dorsal slit is [9]:

- Penis is cleaned.
- Preputial skin is separated from glans penis and smegma removed.
- Penis is cleaned again.
- Local anesthesia is given.
- 1 artery forceps is placed on the frenulum and 2 artery forceps are placed in the 12 o'clock position.
- Skin is cut from the 12 o'clock position until the skin in the prepuce is 0.3 cm from the corona.
- Skin is cut around the penis maintaining a distance of 0.3 cm from the corona but leaving a little more at the frenulum.
- Bleeding should be stopped using bipolar technique or by tying the blood vessels (the use of monopolar diathermy should be avoided because it can disrupt the blood supply to the penis and cause damage to the penis).
- The skin is sutured with strings made from readily absorbable material.
- There is no need for dressing.

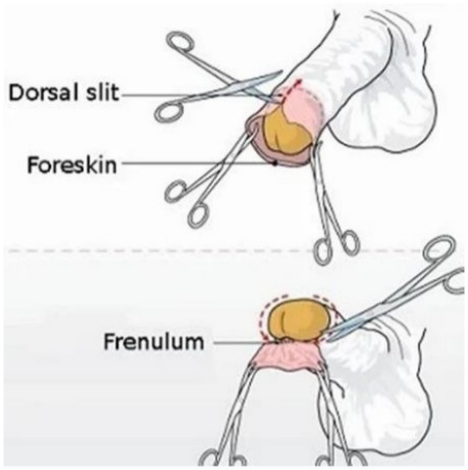

Figure 2.3.1 shows the method of circumcision with the Dorsal Slit Method

2.3.2) Guillotine Method

The procedure of guillotine method [14] :-

- The foreskin is released.
- Mosquito forceps are applied to the tip of the foreskin ventrally and dorsally and the skin protracted.
- A straight forceps is applied along the lower foreskin above the glans.
- The foreskin is excised by cutting above the forceps using a large scalpel blade.
- The inner mucosa is trimmed with scissors, leaving an adequate mucosal cuff.

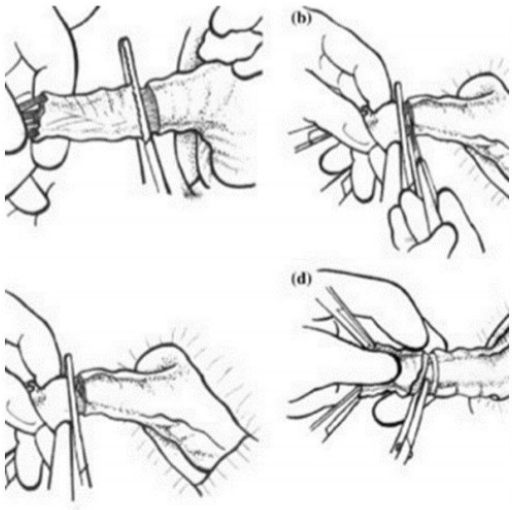

Figure 2.3.2 shows how to circumcise with Guillotine method

CHAPTER 3: METHODOLOGY

This chapter gives an outline of research methods that were followed in the study. It provides information on the participants, that is, the criteria for inclusion in the study, who the participants were and how they were sampled. The researcher describes the research design that was chosen for the purpose of this study and the reasons for this choice. The instrument that was used for data collection is also described and the procedures that were followed to carry out this study are included. The researcher also discusses the methods used to analyze the data. Lastly, the ethical issues that were followed in the process are also discussed.

This is final project flow chart. First of all is gathering fellow group members to study user requirements for design cap with the component. Then create a list of design problems encountered. Next, design the project again and conducting an assessment and selection of concepts and estimating the cost is required to turn on this tool. Lastly, the test runs and performs final repair when there are some mistakes and shortcomings that cannot be detected before the test was done in a project produced before is presented to the panel of assessors appointed by the department for assess the results of this project.

3.1) Introduction

The purpose of using research methodology is to obtain appropriate data so that the study can proceed to the next step. Preliminary research is part of the collection of studies, processing and analysis of data done systematically and efficiently to solve the Problem. This chapter focuses on explaining the study that included the respondents (the method used to obtain the study data from the respondents). Therefore, reviewing the methodology is important to get the views of the respondents regarding the desired data. Methodology also requires a systematic way of working to meet the needs and methods of scientific and quality. The methodology in this chapter refers a lot to the procedure for conducting the study. This research will be more organized and thorough in all aspects.

3.1.1) Flow chart

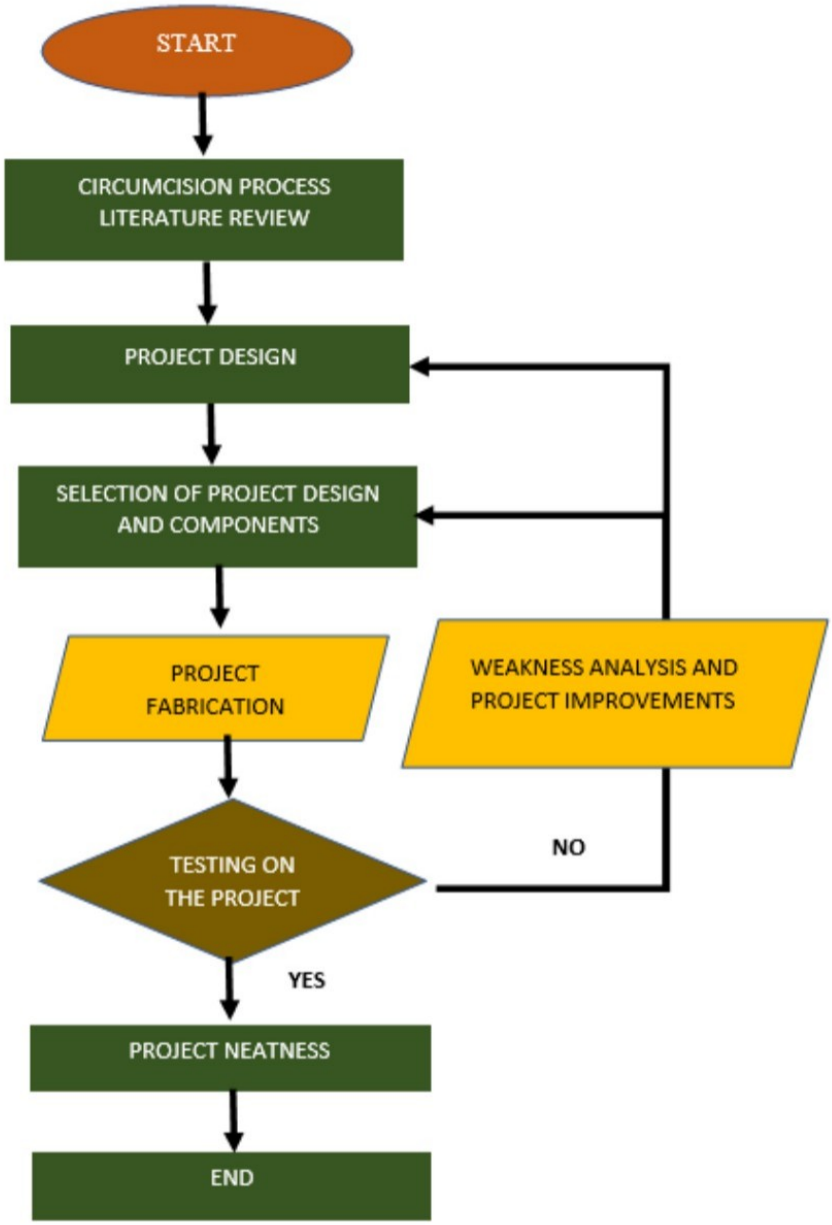

Figure 3.1.1 shows the Flow Chart used in the production and construction of the Flash Cutter project

3.2) Product Design

Based on the literature research that have been conducted, conventional methods in which this method of anesthesia is given, openings on the scalp of the penis (prepuce) will be raised to allow the penis head to be washed. The circumcision can be made and the wounds usually require to bandage and dressing on a daily basis until healed [14]. In addition, clamp method is also a process that is often used by the Tok Mudim, has various types of clamp tools on the market. In short, this tool is used during the circumcised process and most models require our child to come back to open the clamp tool after a week of rest. That means that our child will need to undergo the same clinic anesthetic injections twice (during the first circumcision and when to opening the clamp [7]. Common complications associated with clamping are infections, including bleeding, failure to open the clamp. In addition, the Sutureless Circumcision method is a method without need for stitches. The circumcision is done using a 'cautery' tool and after that Tissue glue or gam will be swept on the wound after the circumcision process [9]. Tissue glue used (octyl cyanoacrylate) is a water drain and has antibiotic content to protect the wound. The complication that sometimes occurs is a small hemorrhage. The cautery pencil has a considerable power source and needs to be connected to the socket whenever it wants to be used. This, causing him to provoke the movement of Doctor or Tok Mudim to circumcised. The 'Cautery' tool is also a bit heavy. Therefore, we created a tool that applies the main concept in manufacturing flash cutter is the concept of 'Styrofoam' where we use wire as cutting tools and we also apply the concept of 'Cautery' by using 'device vape' to generate electricity to produce heat power to cut skin more [1]. This tool is highly recommended for Doctors who are skilled in circumcised and also Tok Mudim.

i. Detailed Design Details

A detailed design is carried out to ensure the project meets the needs of the user. In addition, the project is able to follow all aspects that have been determined so as not to be out of the scope of the project. Indirectly, detailed design income is more effective.

ii. Equipment

Income this project involves the use of Portable grinder, Cutter, Hammer and so on.

iii. Selection And Provision Of Materials

The selection of the right materials is very important to produce an effective project and full the specifications that have been set. Material selection is influenced by the type of equipment used, price, durability and toughness.

iv. Design Project

Design Cutter 1

Our first design made a large Cooper Rod arch and cutting wire that are about 20 cm long and use a microphone connection.

Figure 3.2 a) states the design of 1 cutter

Design Cutter 2

Our second design formed the Cooper Rod into squares precisely and the cutting part we shorten to 15 cm.

Figure 3.2 b) states the design of 2 cutter

Design Cutter 3

Our 3rd design is shorten the size of the cutting place, to be easy to controlled and more light, the microphone connector is replaced with a vape RDA connector and the Cooper Rod is covered by silicon for safety factors.

Figure 3.2 c) states the design of 3 cutter

Design Cutter 4

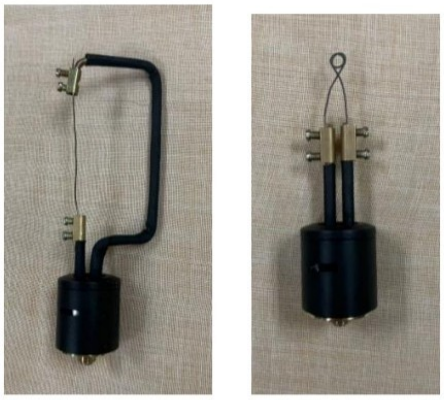

Figure 3.2 d) states the design of 4 cutter

In our 4th design is we have 2 designs , which is Normal Cutter and Depth Cutter . For Normal Cutter we make it short in 6cm of the cutting place and replaced the silicone to Hot bending Silicone also we used stainless steel 316 wire . Next , for Depth Cutter in coil shape by using stainless steel .

3.2.1 Review Of Projects

a) **Data Collection Method**

This research is conducted using a qualitative method through the use of a method of questionnaire through 'Google Form'. The questionnaire is distributed to the respondent face-to-face and online. Next, use the observation method while the circumcised is performed. Observation is done in terms of ergonomics, comfort using the product, easy to control, time taken as well as bleeding rate during sculpting.

b) **Data Analysis Methods**

Collected data are processed and analyzed using descriptive statistics and also analysis of respondents of questionnaire. This questionnaire form has 24 questions. A total of 10 MediCOM members responded to the questionnaire, most of whom agreed with the Flash Cutter project.

3.2.2 Real Type Projects

a) Revenue Project Process

This research will be conducted using qualitative methods. Flash Cutter are using materials such as rod cuprum, wire nichrome, silicon, connector wire, Dripper RDA Vape and Device Vape which are easy to find in the market. In addition, the concept applied in this project is Styrofoam which is a cork cutter by using wire for cutting. When the electricity is flowed heat will be produced in the wire. For the concept of generating electricity, we took the diathermy concept which is a circumcision device that has a rather large and heavy power supply, difficult to carry anywhere, so we replaced the vape device for electricity supply and heat power in the Flash Cutter project. For the length of the cutting wire is 9 cm, for the overall height of the Flash Cutter is 20.75cm and for the largest width is 3.69cm. This project is very suitable for to use by Tok Mudim and Doctors who perform circumcision services for men only. This project is specialty for Doctors and Tok Mudim who have experience in circumcised for men. Not recommended for whose don't have any experiences. In addition, the project is portable, lightweight and easy-to-control by those who are experts in circumcised. Not only is it very ergonomic when using it, doctor or Tok Mudim can sit or stand, it is easy to move right or left according to comfort because the Flash Cutter is not tied to any wirelessly worn. Therefore, Flash Cutter is highly recommended to Tok Mudim and Doctor to use it.

Manufacturing Process:

1) Measure the length of the copper rod by using a ruler and mark just a little where you want to cut it using the plier.
2) Cut the copper rods according to the set length using a Portable Grinder.
3) Shape the copper rod to the specified shape using a hammer and anvil.
4) Grind into all the cross sections of the copper rod that have been cut so that the surface is smooth and grind each part on the end of the copper rod so that it fits to be inserted into the connector wire.
5) Cut 9 cm long nichrome wire by using The Cutter.
6) Connect the grated copper rods tightly inside the vape coil using a Mini Screwdriver.
7) Connect the copper rod to the wire using the wire connector and Mini Screwdriver
8) Connect the vape coil with the Vape Device
9) Ready to use.

Tests Performed:

- The test is performed by using chicken skin

B i) Material Selection

1. Cooper Rod

Figure 3.2.2 a) shows a 3mm copper rod used as a cutter body

Cooper rods which are always used as raw material in the manufacture of wireless and electrical cables. Cooper Rods have excellent electrical flow and heat flow properties suitable as a connector between cutting strings and connecting to vape devices. The diameter of the cuprum rod used for Flash Cutter is 3mm and the length is 19.5cm. The cuprum rod is tapped or bent so that it becomes a large C shape and a small L shape. The price of a 2meter rod cuprum is RM 26.00

2. Stainless Steel 316

Figure 3.2.2 b) shows a Stainless Steel 316 used as cutting wire

Grade 316 stainless steel is composed of approximately 16% chromium, 10% nickel, and 2% molybdenum. High concentrations of chromium and nickel offer increased chemical resistance over other medical grade steels, while molybdenum helps to bolster corrosion resistance. Stainless Steel 316 Wire is as a place for cutting excess skin is done when heat is passed from the vape device as well as Stainless steel 316 Wire is used in the vape connector as a connection between the 2 coils along 9 cm as a cutting wire and 2 x 0.25cm long coil inside the vape connector. The price for a roll of Stainless Steel 316 Wire is RM 13

3) Connector Wire

Figure 3.2.2 c) shows the connecting wire used as the connector between the cutter body and the cutting wire

A wire connector made from copper or brass serves as a link between 2 cables or wires of the same size, or cables with different cross sections and made of different materials as well as the concept applied in Flash Cutter. The wire connector used is to connect a copper rod that has been milled by using a grinding machine with nichrome wire. The wire connector costs RM 2.00 for a 1 set (6pcs).

4) Dripper RDA

Figure 3.2.2 d) shows Dripper RDA Double Coil used as connector to heater device

Dripper RDA Vape is used to connect between copper rod or cutting wire with device vape to obtain heat energy to cut excess skin. The height of this Dripper is 3 cm. The price is RM 29.00 per unit. 3 quantity of Dripper RDA Vape. The dripper or coil has a coil of wire or nichrome wire in it.

5) Vape Device

Figure 3.2.2 e) shows the Vape Device used as a heating device as the heat source of the cutting wire

As we know this vape device is used as an electronic cigarette or E-cigarette for adults. This vape device uses batteries to generate electrical energy to heat the liquid until it turns into a smoke. The same is true in the Flash Cutter project. This vape device is used to generate electrical energy to thermal energy to heat the cutting wire for the circumcision process. The battery used is a type of lithium that needs to be charged when you want to use it and the cable used is a micro type. The height of this device is 8 cm and costs RM 200 per unit. This device can change the mode or temperature according to the suitability of use, the maximum temperature is 80 C.

6) Hot Bending Silicone

Figure 3.2.2 f) shows Hot Bending Silicon used to coat copper rods

These Hot Bending Silicone are used to protect hot copper rods from contacting the user's limbs or simply as thermal insulation for copper rods. The copper rod is inserted into a Hot Bending Silicone with a 2m and priced at RM 4.00 / 2 meter.

b) Tools Used

1) Hammer

Figure 3.2.2 g) shows a Hammer as a tool used in project development

This hammer is used to shape the copper rod according to the desired shape which is C large and L small.

2) Anvil

Figure 3.2.2 h) shows Anvil as a tool used in project development

Anvil is used to support the copper rod while the tapping work is done to form the copper rod beautifully.

3) Grinding Machine

Figure 3.2.2 i) shows a Grinding Machine as a tool used in project development

This machine is used to grind over the end of the copper rod a little to fit inserted into the wire connector. Finally, level the cross -sectional surface of the copper rod.

4) Cutter

Figure 3.2.2 j) shows a Cutter as a tool used in project development

Cutters are used to cut 9 cm long stainless steel wire and cut hot bending silicone.

5) Mini Screwdriver

Figure 3.2.2 k) shows a Mini Screwdriver as a tool used in project development

The mini screwdriver is used to loosen and tighten the small screws of the wire connector and on the vape coil.

6) Angle Grinder

Figure 3.2.2 l) shows a Angle Grinder as a tool used in project development

Angle Grinder is used to cut copper rods according to the desired length.

7) Plier

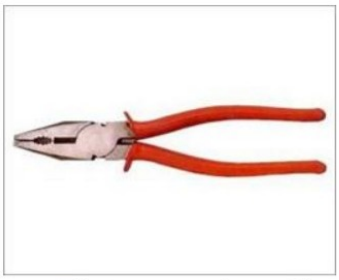

Figure 3.2.2 m) shows a Plier as a tool used in project development

2 Pliers are used to hold silicon and hold copper rods for the process of inserting copper rods in silicon tubes.

3.3) Project Fabrication Method

No.	Method	Equipment	Functions
1	Grinding	• Foot grinder • Portable grinding machine	• Grinding the cross-sectional surface of the copper rod and above the end of the copper rod • Cutting copper rods
2	Forming And Tapping	• Hammer • Anvil	• Form a copper rod with a hammer and supported by an anvil to get the shape
3	screw	• Mini Screwdriver	• Connect the copper rod with the wire using a connector wire • Tighten the copper rod with dripper RDA
4	Insert the copper rod inside the silicon tube	• 2 pliers	• 2 Players are used to hold the silicon and hold the copper rod for the process of inserting the copper rod inside the silicon tube.

Table 1 shows the project fabrication process in flash cutter project development

3.4) Summary's Chapters

The research in this chapter describe the project methods, material selections, product design, project making process, fabrication methods and Gantt chart. The methodology flow chart is the first section covered in this chapter. The explanation was finished in order to have a better understanding of this project. The following section of this section of this chapter is about purchasing materials and explanation about fabrication process. More information is provided on the materials purchased for Flash Cutter. To ensure that the budget is reasonable and affordable for this project. the budget calculation of the materials purchase was also included with the real price of purchasing. Next, the method selection is explained in grater detail throughout this chapter. It is about the method that will be used to complete and make the project work. The product design is also shown in 3D modeling and the real project allowing it to be applied to a real-world. Not only that, the process fabrication also shown in this chapter. Lastly, the project activity is explained using a Gantt Chart, which explains the project production planning schedule and implementation.

CHAPTER 4 : RESULTS AND DISCUSSION

4.1) Introduction

This chapter discusses the results of wire heating speed differences used on Flash Cutter cutting tools between Stainless steel 316 wire and Nichrome 80 wire, as well as respondents' opinions on the use of Flash Cutter in circumcising circumcised patients and producing high quality circumcision tools to meet current market needs. Each test is performed carefully and follows all procedures of prudent use.

4.2) Finding Project

ACHIEVEMENT OF THE SECOND OBJECTIVE

Our second objective was to develop a Flash Cutter prototype model. This is evidenced by our success in developing a prototype model of Flash Cutter that works successfully.

ACHIEVEMENT OF THE SECOND OBJECTIVE

Our second objective was to develop a Flash Cutter prototype model. This is evidenced by our success in developing a prototype model of Flash Cutter that works successfully.

ACHIEVEMENT OF THE THIRD OBJECTIVE

Our third objective is the testing of the Flash Cutter product where some testing is done for the functionality of this Flash Cutter product. We performed the testing by cutting on paper, mineral bottles and chicken skin. Speed testing of cutting wire turning red was also carried out between Stainless Steel 316 wire and Nichrome 80 wire.

4.3) Results Of Comparison Of Red Flame Speed Between Wire Types

Speed testing of the cutting wire turning red was performed between Stainless Steel 316 and Nichrome 80 wires. Both these wires were tested for speed using different wattages and the time of each test was recorded for the result record. Any entries are written and recorded for the use of the results record by being interpreted through testing.

Types wire	Wattage (W)	Time taken for the cutting wire to turn red (seconds, s)
Stainless Steel 316	30.0	5.0
	32.5	3.0
	35.0	2.5
	40.0	1.8
	50.0	1.3
Nichrome 80	30.0	5.0
	32.5	2.9
	35.0	2.3
	40.0	1.5
	50.0	1.1

Table 4.3 shows a table of test results comparing the Red Flame Speed Between Stainless Steel 316 dan Nichrome 80

4.3.1) Result of Data Analysis

Studies have been conducted between conventional equipment, Flash Cutter and Diathermy to conduct comparisons in terms of market price, time taken to circumcise, tool design, type of energy used and methods used in the circumcision process. This study is also carried out to monitor and compare in studying the market value and target market for this flash cutter product

Type	Price	Time(m)	Design	Type of Energy	Method
Conventional	RM 65.00	40 – 60	Small & portable	Human Energy	Dorsal Slit Method & Guillotine Method
Flash Cutter	RM 400.00	30	Small & portable	Thermal Energy	Electrocauterization
Diathermy	RM 8502.80	30	Big & use more space	Thermal Energy	Electrocauterization

Table 4.3.1 shows the result of data analysis of 3 types of circumcision tool

4.4) Survey Form On Respondents

In the process of obtaining the respondents' opinions, a total of 23 questions were given. A total of 10 respondents including circumcision physicians who work in Government Hospitals or Clinics want a pound of private circumcision physicians who have their own clinics have answered the questionnaire distributed using the "Google Form" application.

4.5) Demographic Profile

Based on appendix 2 is a questionnaire. There were 10 questionnaires distributed, 4 Tok Mudim and 6 MediCOM people answered the questionnaire. As a result of the questionnaire, all respondents have more than 3 years of experience in this field of circumcision and are satisfied with the Flash Cutter product. In conclusion for all the answers to the questionnaire, all respondents agreed that the Flash Cutter product is safe and easy to operate to assist Tok Mudim and doctors in this circumcision process.

4.6) End Of Product

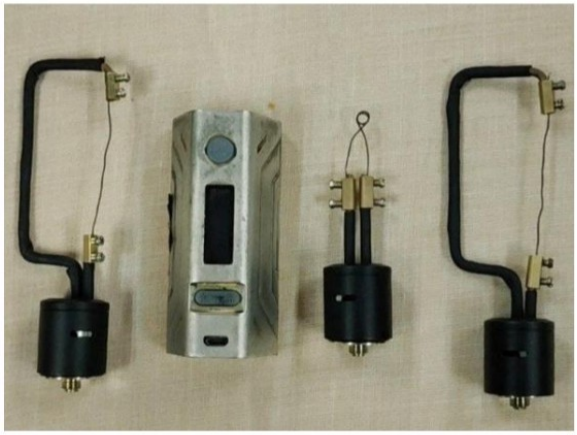

Figure 4.6.1 shows the final result of Flash Cutter set

After the testing process and respondent feedback is done this is our final product where it comes with 1 set of Flash Cutter. The Flash Cutter set has 1 adjustable wattage vape device, 2 normal cutters, 1 depth cutter and 30ft Stainless Steel Wire.

Normal cutter is used for the initial process of circumcision when wanting removal of the foreskin from the human penis while depth cutter is used to close the blood vessels in case When the circumcision process is running and minor bleeding complications occur. So a depth cutter will be used to close the blood vessels.

4.7) Summary's Chapter

The proposal report went over the details of the project introduction, findings project, results comparison of red flames speed between wire types, survey form respondent by using google form to Tok Mudim and Doctors, demographic profile and end of product. Next, Stainless Steel wire is save to use and did not give allergic effect to humans as Nichrome 80(5). For survey form, we can conclude that all respondents can accept and agree with the existence of a flash cutter as a circumcision tool for men and safe to use.

CHAPTER 5: CONCLUSION AND RECOMMENDATION

5.1) Introduction

For this chapter, the decision is made based on all the results obtained from the experiments conducted and the discussion is about the objectives of the study and also recommendations for the study conducted. In addition, conclusions have been drawn for this experiment.

5.2) Discussion

During the implementation of the project, various corrections and tests are implemented to meet the objectives, scope and limitations that have been stated. Among the tests performed was the time taken by the wire to turn red with heat. Furthermore, the ability of a heater battery or vape device to supply electrical power to thermal energy to test the duration of use. In addition, a chicken skin cutting test was performed to test the functionality of the cutter. When all the tests have been successfully run on Flash Cutter and met our expectations, this means we have successfully achieved our objectives.

5.3) Conclusion

The main objective of the flash cutter is to facilitate the work of Tok Mudim and doctors in the circumcision process. Where it is easy to operate and safe to use. Made from a material that is believed to be for example Stainless Steel 316, this material is widely used in medicine such as Artificial heart valves, Orthopedic implants, Medical devices, Chemical processing and storage equipment and so on. Medical grade stainless steels are part of the austenitic stainless steel family, a category known for its high formability and exceptional corrosion resistance. Grade 316 stainless steels contain high levels of nickel which provide additional chemical properties, making them suitable for use within the extreme demands of the medical industry(5). In the other hand, the vape device serves as a heater to cut off excess skin. lastly, recommend to all of Tok Mudim and doctors in circumcision expertise to facilitate the process.

5.4) Recommendation

The research proposal is a listing of several further research recommendations to further strengthen the research findings in the field studied. In other words, new proposals should be put forward as a result of the findings of the study. :-

- Storage box as a place to store flash cutter tools
- Welding between copper rod and coil dripper RDA to strengthen the stability of the cutter
- Better and lighter heater device to increase mobility
- Single Coil of Dripper RDA to strengthen of the cutter

5.5) Project Limitation

- The recommended maximum wattage is not more than 60 watts
- The battery of this device need to charge
- Could last for a long time with a good care.
- This product could not be exposed to water.

5.6) Chapter's Summary

This chapter tells about the project improvements that need to be done to make this project work better as well as the many advantages this flash cutter will do.

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7) ATTACHMENT

i) Gantt Chart

PERANCANGAN / AKTIVITI	STATUS	MAC				APRIL				MEI				JUN		
		MK1	MK2	MK3	MK4	MK5	MK6	MK7	MK8	MK9	MK10	MK11	MK12	MK13	MK14	
Taklimat projek 1	P															
	C															
Pembahagian Kumpulan & Penyelia	P															
	C															
Penyediaan Buku Log	P															
	C															
Perbincangan untuk Mendapat Idea Projek	P															
	C															
Carta Alir Projek	P															BERSAMA
	C															
Lakaran Awal Projek	P															
	C															
Penghantaran Awal Tajuk Projek Untuk Dinilai	P															
	C															
Tinjauan Bahan Projek (survey)	P															
	C															
Pemilhan Bahan Projek	P															
	C															
Pembinaan Projek	P															HAYKAL
	C															
Pengujian Projek 1	P															
	C															
Perbincangan Masalah Projek	P															
	C															
Penambahbaikan Projek	P															BERSAMA
	C															
Pengujian Projek 2	P															
	C															
Menulis Proposal (Pengenalan)	P															HAYKAL
	C															
Menulis Proposal (Literature review	P															HAKIMI
	C															
Menulis Proposal (Methodology)	P															IZZAH
	C															
Membuat inventor	P															
	C															
Membuat Slide Pembentangan	P															
	C															BERSAMA
erbentangan Proposal & Sebaran pembetulan yang perlu dilakukan	P															
	C															
Penghantaran Proposal dan Logbook	P															
	C															

PERANCANGAN / AKTIVITI	STATUS	MK1	MK2	MK3	MK4	MK5	MK6	MK7	MK8	MK9	MK10	MK11	MK12	MK13	MK14
Taklimat projek 2	P														
	C														
Perbincangan penambahan idea pada projek	P														
	C														
Penyediaan Buku Log	P														
	C														
Carta Alir Projek	P														
	C														
Lakaran Awal Reka Bentuk Baharu	P														
	C														
Tinjauan Bahan Projek (survey)	P														
	C														
Pemilihan Bahan Projek	P														
	C														
Pembinaan Projek	P														
	C														
Pengujian Projek 1	P														
	C														
Perbincangan Masalah Projek	P														
	C														
Penambahbaikan Projek	P														
	C														
Pengujian Projek 2	P														
	C														
Menulis Laporan Akhir (Pengenalan)	P														
	C														
Menulis Laporan Akhir (Literature review)	P														
	C														
Menulis Laporan Akhir (Methodology)	P														
	C														
Menulis Laporan Akhir (Analysis and Discussion)	P														
	C														
Menulis Laporan Akhir Conclusion & Recommendation	P														
	C														
Membina Poster Projek	P														
	C														
Membina Video Projek	P														
	C														
Pembentangan Akhir Projek 2	P														
	C														
Penghantaran Laporan Akhir dan Logbook	P														
	C														

Figure 3.1.2 shows Gantt Chat shows project activities carried out

ii) Inventor Sketch

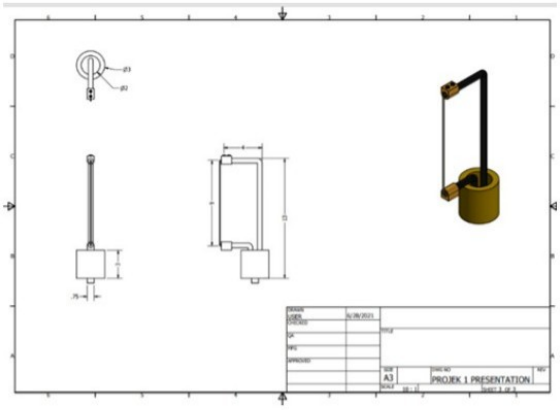


Figure 3.1.3 shows inventor section of the cutting wire

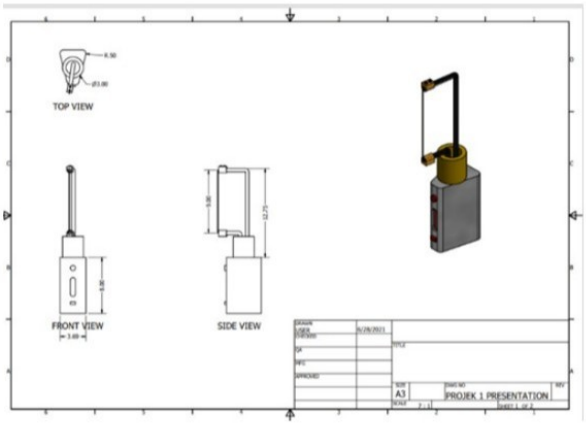


Figure 3.1.4 shows inventor section of Flash Cutter sketch

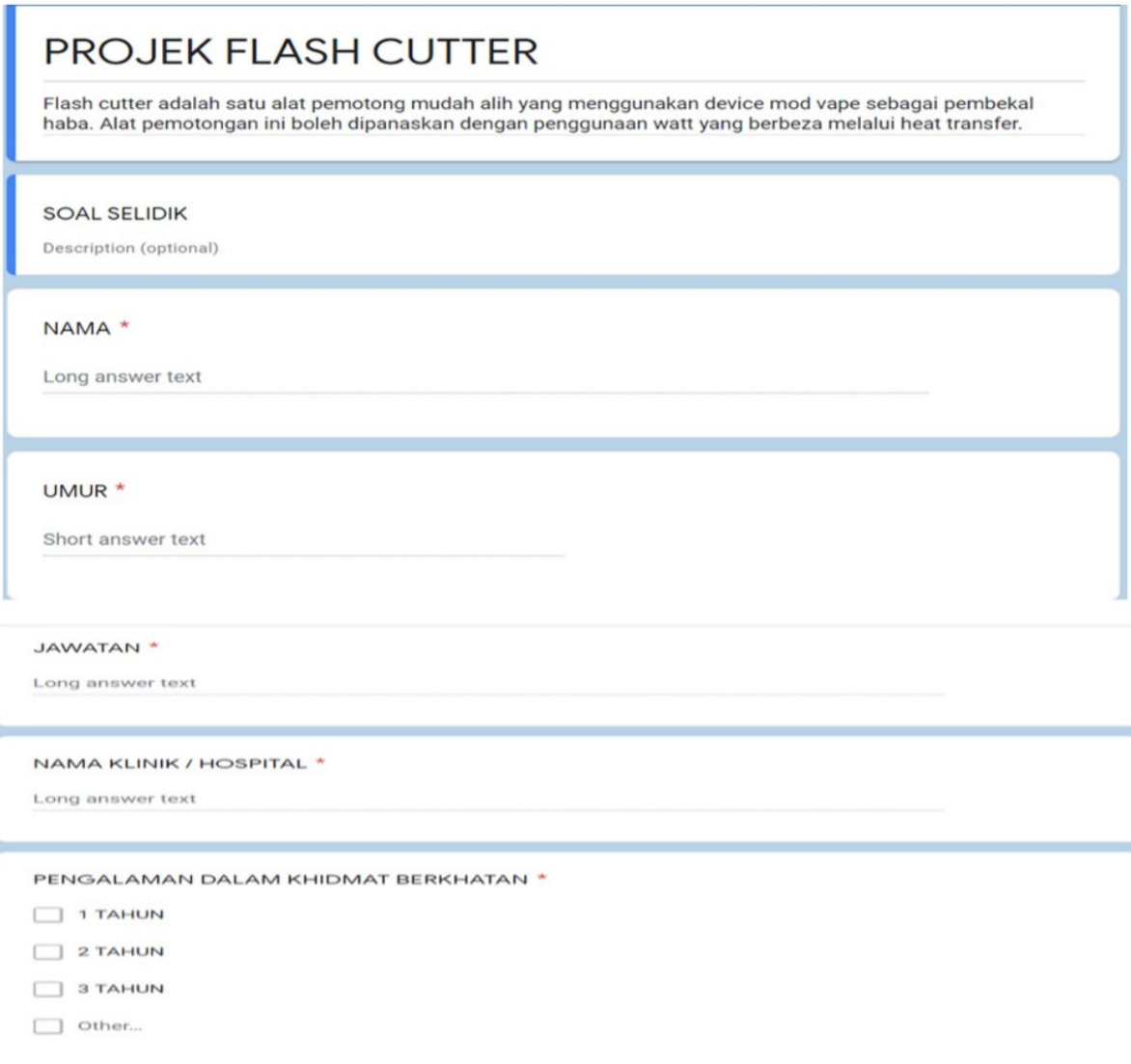
Figure 3.1.5 shows 3D inventor sketch of Flash Cutter

iii) Project Cost

NO	ITEM	QUANTITY	PRICE PER UNIT (RM)	PRICE (RM)
1	VAPE DEVICE	1	200	200
2	TANK DRIPPER RDA	3	29	87
3	CONNECTOR WIRE	1 SET (6PCS)	2	2
4	STAINLESS STEEL 316 (30ft)	1	25	25
5	HOT BENDING SILICONE	2 METER	2/METER	4
6	CUPRUM ROD 3 MM	2 METER	13/METER	26
7	FLASH CUTTER BOX	1	15	15
			TOTAL:	359

Table 2 shows the cost value of each component in the development of a flash cutter project

Iv) Survey Form



PROJEK FLASH CUTTER

Flash cutter adalah satu alat pemotong mudah alih yang menggunakan device mod vape sebagai pembekal haba. Alat pemotongan ini boleh dipanaskan dengan penggunaan watt yang berbeza melalui heat transfer.

SOAL SELIDIK

Description (optional)

NAMA *

Long answer text

UMUR *

Short answer text

JAWATAN *

Long answer text

NAMA KLINIK / HOSPITAL *

Long answer text

PENGALAMAN DALAM KHIDMAT BERKHATAN *

- 1 TAHUN
- 2 TAHUN
- 3 TAHUN
- Other...

ALAT BERKHATAN JENIS APA YANG DIGUNAKAN SEBELUM INI ? *

Short answer text

NYATAKAN JENIS TEKNIK BERKHATAN YANG DIGUNAKAN *

Long answer text

SELEPAS PROSES BERKHATAN DIJALANKAN DENGAN MENGGUNAKAN FC

FC (FLASH CUTTER)

Setelah menggunakan flash cutter ini , apakah perbezaan di antara menggunakan flash cutter dan alat berkhatan sebelum ini ? *

Long answer text

Adakah potongan menjadi cantik dan rapi setelah menggunakan Flash Cutter ? (ya/tidak) nyatakan sebab... *

Long answer text

Dari segi rekabentuk , adakah rekabentuk dan bahan yang digunakan ini sesuai untuk proses berkhatan ? *

- ◯ Ya
- ◯ Tidak

Adakah dawai pemotong yang di gunakan sesuai untuk proses berkhatan ?? *

Short answer text

Dari segi masa , berapa lama masa yang diambil untuk membuat proses pembedahan dgn menggunakan Flash Cutter ? *

Short answer text

Adakah Flash Cutter ini sesuai untuk digunakan kepada bayi atau usia kanak-kanak dibawah usia 5 tahun? *

- ◯ Ya
- ◯ Tidak

Adakah Flash Cutter ini sesuai utk kanak-kanak yang mempunyai berat badan berlebihan / obesiti ? *

- ◯ Ya
- ◯ Tidak
- ◯ Mungkin

Bolehkah produk ini digunakan untuk doktor yang kurang pengalaman /kemahiran ? *

- Ya
- Tidak

Berapa lama proses penyembuhan selepas menggunakan flash cutter ? *

- 3 Hari
- 5 Hari
- 1 Minggu
- Other...

Adakah alat ini mudah untuk d kendalikan ? *

- Ya
- Tidak

Adakah alat ini sesuai utk dgunakan pada alat sulit buta ataupun biasa? *

Long answer text

Berapakah skala risiko pendarahan setelah menggunakan flash cutter dan alatan yang lain *

	0	1	2	3	4	5	
Tiada	○	○	○	○	○	○	Sangat Banyak

Nyatakan tinggi / rendah kadar risiko untuk terhiris bahagian lain pada alat sulit kanak - kanak , nyatakan sebab .....

Long answer text

Tahap kesakitan *

	1	2	3	4	5	
Tiada	○	○	○	○	○	Sangat sakit

Kesimpulannya , adakah alat ini selamat digunakan untuk proses berkhatan ? *

- SELAMAT
- TIDAK SELAMAT

FEEDBACK FLASH CUTTER *

- SANGAT PUAS HATI
- BIASA SAHAJA
- TIDAK PUAS HATI

V) Result Survey Form

SOAL SELIDIK

NAMA

10 responses

BAHARUDDIN ROS

MUHAMMAD KHAIRI BIN SHAHARUDDIN

Abdul Razak

MUHAMMAD FAIZ BIN AHMAD ZAID

MOHD HALID BIN SAHAT

muhammad rashid bin sameon

MUHAMMAD SHAHRUL NIZAM BIN MOHD ZAKIR

Mohd saleh bin hassan

mustaffa bin mohd hussien

JAWATAN

10 responses

Mudim

MUDIM (MA)

TOK MUDIM

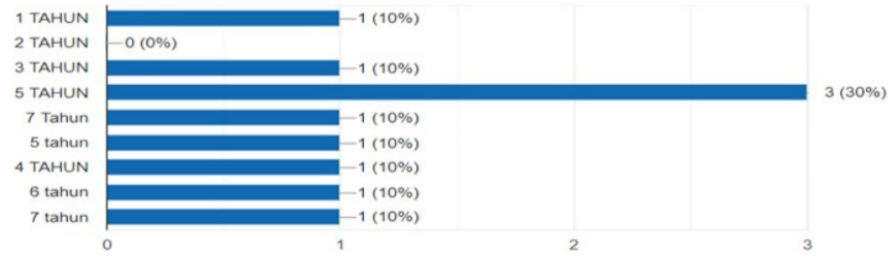
Ir

JURURAWAT

Medicom (MA)

PENGALAMAN DALAM KHIDMAT BERKHATAN

10 responses



ALAT BERKHATAN JENIS APA YANG DIGUNAKAN SEBELUM INI ?

10 responses

Clamp
Alat Khitan jenis elktrik dan alat jenis guna alat vape
Cautery, diatemy, gunting dan pisau
Cauthery
Cautery
CAUTERY
gunting dan pisau, clamp
Pisau dan gunting
Diatermy, cautery

NYATAKAN JENIS TEKNIK BERKHATAN YANG DIGUNAKAN

10 responses

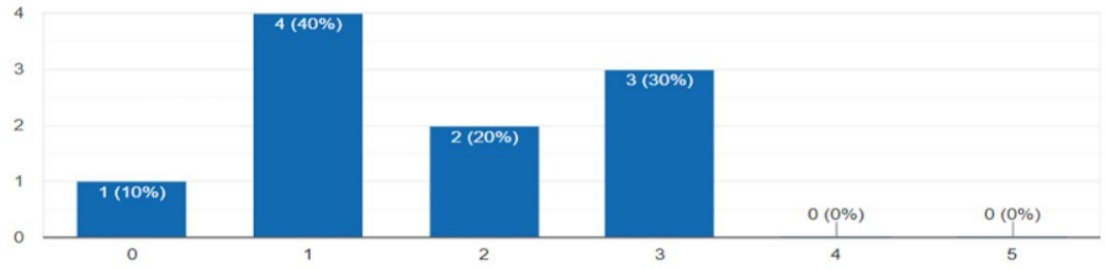
LASER
Dorsal slip dan dorsal clamp
Clamp
Laser
Dorsal slip
Dorsal slip
Dorsal slip, clamp
DORSAL SLIP

Dari segi rekabentuk , adakah rekabentuk dan bahan yang digunakan ini sesuai untuk proses berkhatan ?

10 responses

Berapakah skala risiko pendarahan setelah menggunakan flash cutter dan alatan yang lain

10 responses



Nyatakan tinggi / rendah kadar risiko untuk terhiris bahagian lain pada alat sulit kanak - kanak , nyatakan sebab .....

10 responses

Rendah
Risiko jika kurang pengalaman
Tinggi, bergantung kepada teknik dan holder alat selepas digunakan
Bergantung kepada cara memotong. Jika guna cara selamat maka risiko hampir tiada.
risiko sekira pengguna kurang pengalaman
rendah sekiranya berpengalaman
Rendah, tidak perlu menggunakan daya yang kuat
TINGGI SEKIRANYA TIDAK BERPENGALAMAN

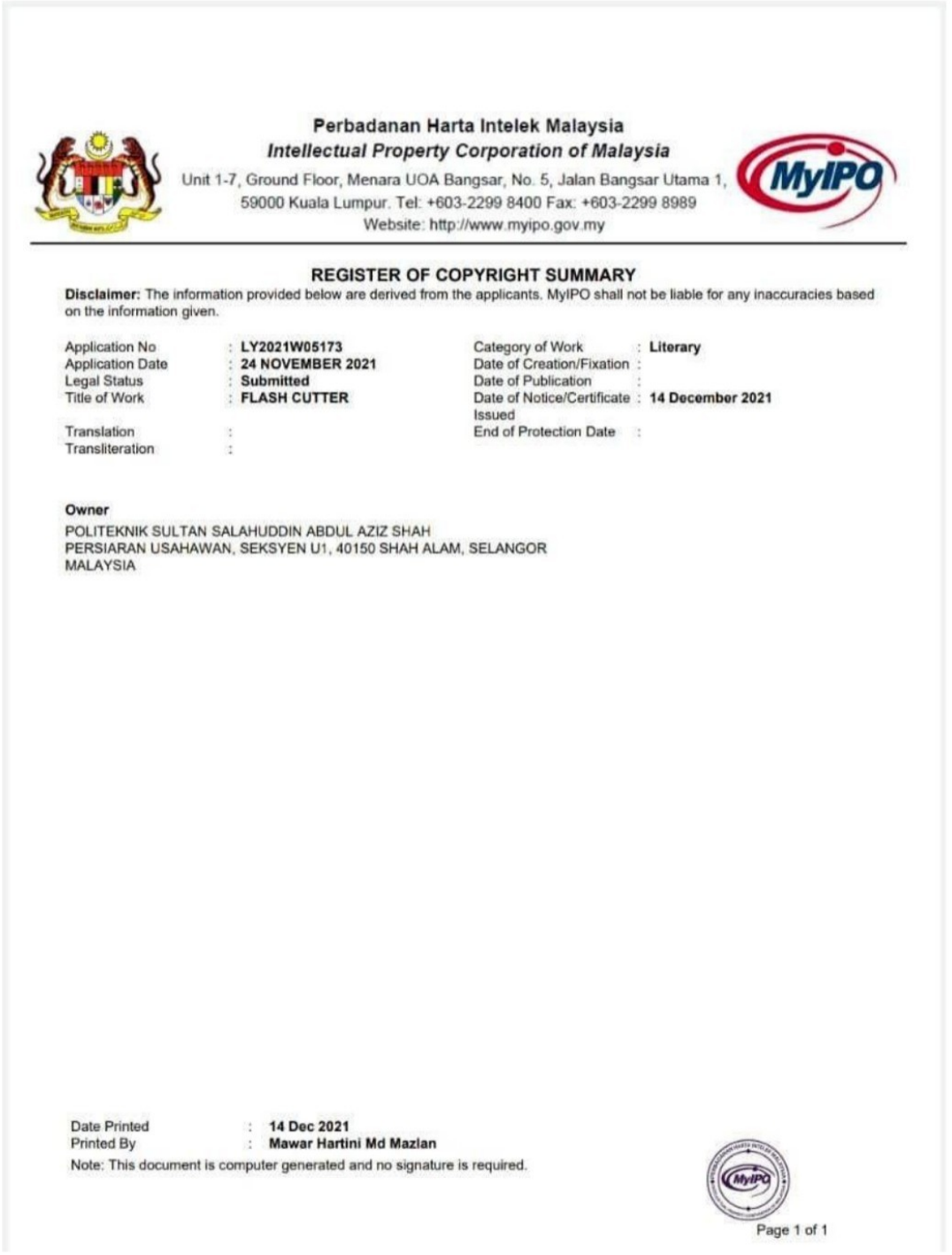
Kesimpulannya , adakah alat ini selamat digunakan untuk proses berkhatan ?

10 responses

FEEDBACK FLASH CUTTER

10 responses

VI) MYIPO Application Number



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Page 1 of 1

VII) Appreciation Letter from MediCOM

22hb Ogos 2021

Pn Zetty Rohaiza Binti Mohd Sahak @ Ishak (Penyelia)
Dr Mohd Elias Bin Daud (Penyelia)
Muhammad Haykal bin Halid (Pelajar)
Muhammad Khairul Hakimi Bin Mohd Samsudin (Pelajar)
Izzah Sakinah Binti Abdullah Zawawi (Pelajar)
Jabatan Kejuruteraan Mekanikal Politeknik Sultan Salahuddin Abd Aziz Shah, Persiaran Usahawan
Seksyen U1, 40150
Shah Alam, Selangor

السَّلَامُ عَلَيْكُمْ وَرَحْمَةُ اللهِ وَبَرَكَاتُهُ

Tuan/Puan,

PER : PENGHARGAAN ATAS PENGGUNAAN PRODUK INOVASI UNTUK PROGRAM KEBAJIKAN

Adalah saya dengan hormatnya merujuk kepada perkara di atas.

2. Pertubuhan Amal Kebajikan & Perubatan Malaysia (MediCOM Malaysia) ingin merakamkan setinggi penghargaan kepada Jabatan Kejuruteraan Mekanikal, Politeknik Sultan Salahuddin Abdul Aziz Shah, Shah Alam di atas penggunaan alat inovasi projek pelajar iaitu ' FLASH CUTTER' untuk kegunaan pasukan MediCOM Malaysia bagi program ibadah berkhatan yang telah dilaksanakan di Klinik Tasik Puteri, Rawang Selangor.

3. Dengan ini, pihak kami ingin mengucapkan jutaan terima kasih di atas kerjasama pihak Tuan/Puan dalam penyediaan satu produk inovasi bagi penggunaan proses berkhatan serta sokongan untuk pihak kami menjayakan program kebajikan dibawah kendalian kami.

4. Pihak kami berharap kerjasama sebegini dapat di teruskan dimasa hadapan demi kepentingan masyarakat awam. Semoga Allah memberkati segala usaha dan kerja sama yang di berikan.

Sekian, terima kasih

'KEBAJIKAN TANPA BATASAN'

Yang Benar,

HAJI ABDUL RAZAK MOHAMED
Ketua Pegawai Eksekutif
MediCOM Malaysia

PERTUBUHAN AMAL KEBAJIKAN & PERUBATAN MALAYSIA (MediCOM) (PPM-006-10-13052017)
12A, Jalan Opera H U2/H, Taman TTDI Jaya, 40150 Shah Alam, Selangor, MALAYSIA
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