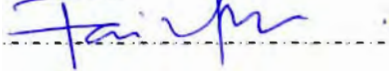


APPROVAL

I hereby approve have read this thesis submitted to the senate of UTeM and have accepted this thesis as partial fulfillment of the requirements for the degree in Bachelor of Mechanical Engineering (Design & innovation).

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TEH TARIK MACHINE

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This report is submitted in partial fulfillment of the requirement for the Bachelor of
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MEI 2008

DECLARATION

I hereby, declare this thesis entitled
“TEH TARIK MACHINE”
is the results of my own research except as cited in the reference.

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ABSTRACT

This project of designing and building a prototype of a teh tarik machine is divided in two parts. First part of the project is about proposal and the second part is about producing the prototype of the machine. This report fully describes about the combination of both part, which contains six chapters starting from introduction, literature review, methodology, results, discussion and conclusion respectively. The main objective of the project is to design and build a prototype of a machine. The conceptual design has been done through sketching by using free hand. After that, the design of the machine was being created by using software such as AutoCAD or CATIA. The process of manufacturing has been done after completing the assembly design in software. This machine has been done by using stainless steel for the body part. Meanwhile, there was also electrical circuit that has been inserted in the machine. This electrical circuit consist of heater element and blender function. The both of the part has been combined together and used to produce the “teh tarik” beverage.

ABSTRAK

Projek ini yang membabitkan proses merekabentuk dan penghasilan prototaip mesin teh tarik terbahagi kepada dua bahagian. Bahagian pertama adalah mengenai pengenalan kepada projek tersebut dan bahagian kedua adalah mengenai penghasilan penghasilan produk tersebut dalam bentuk prototaip. Laporan ini secara keseluruhan mempunyai 6 bahagian yang bermula dengan pengenalan, kajian ilmiah, metodologi, keputusan, perbincangan dan akhirnya kesimpulan. Bahagian pengenalan menceritakan tentang objektif dan skop serta keputusan yang akan terhasil daripada projek ini. Objektif utama projek ini adalah untuk merekabentuk dan membina satu prototaip mesin teh tarik. Lukisan menggunakan tangan akan dibuat pada peringkat awal untuk menyediakan asas rekabentuk produk tersebut. Projek ini akan menggunakan perisian seperti AutoCAD dan CATIA untuk proses merekabentuk. Proses pembuatan akan dimulakan selepas lukisan produk tersebut telah disiapkan menggunakan perisian komputer. Produk tersebut menggunakan bahan besi tahan karat untuk membuat badannya. Manakala, peralatan elektrik juga telah dimasukkan di dalam produk tersebut. Peralatan elektrik ini terdiri daripada 2 bahagian iaitu bahagian pemanas dan bahagian pengisar. Produk yang telah siap sepenuhnya boleh menghasilkan teh tarik seperti yang telah ditetapkan di objektif projek ini.

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LIST OF ABBREVIATION

ABBREVIATION	DESCRIPTION
UTeM	Universiti Teknikal Malaysia Melaka
PSM	Projek Sarjana Muda
DC	Direct Current
CATIA	Computer Aided Three dimensional Interactive Application

LIST OF APPENDICES

APPENDIX	TITLE
Appendix A:	Gantt Chart
Appendix B:	Questioners
Appendix C:	Design Parts

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter covers about the problem statement that being faced by the makers and drinkers of “teh tarik”. After that, objective of making this machine being explained and the scope of this project being covered. The scope will explain about the relation between the report and the machine that are focused in the making. The final part will be about the outcome of this project.

1.2 Problem Statement

The problem that been faced by the “teh tarik” makers and drinkers is that they usually have to go to the shop to taste the tea. In this case, the drinkers will choose their favorite shops or restaurant to have their drink. This could create some transportation problem on getting to the place. Beside that, there is also have some hygiene problem either by the makers or the shop environment. The drinkers faced with time management when some of them are morning tea drinkers. They have to rush to their job in the morning while having their drink prepared in the house by themselves. The beverage price are also getting higher each time the sugar or milk powder price getting high. The composition of the tea also plays a major part in making the tea. Some of the drinkers prefer strong taste of tea meanwhile others like light kind. Temperature also important when preparing the beverage.

1.3 Objective

The objectives of this project are to:

- Research about the tea making process manually and study them carefully.
- Compare the coffee maker machine with tea maker machine and identify the difference.
- Prepare a design through sketching and software designing process by doing conceptual and part design then assembling it.
- Identify the production process and the usage of machines in fabricating the prototype.
- Fabricate the prototype of the machine that can prepare tea beverage at a good composition and perfect temperature.

1.4 Scope

The main scope of this project is to generate ideas of the design to build the beverage machine. The design must be analyzed to create a machine that produce and prepare a good tea. Finally, a prototype must be build that is function able and is user friendly. Chapter 1 will cover about the introduction to the report. Meanwhile, chapter 2 will discuss about literature review. This chapter will cover about tea description, electronic and electric devices, production machines and material selection. Chapter 3 is about methodology that covers about the methods that will be used to prepare the prototype and all the process involved in the production. Where else, chapter 4 is about the design development that been done for the machine. Meanwhile, chapter 5 will cover the manufacturing process upon completing the machine and the problem that been faced in production. Chapter 6 will shows the testing that been done after completing the machine. These testing will be based on selected factors such as taste testing, temperature observation and others. The discussion part will be covered in Chapter 7. The discussion will be about defects of the machine and problems being faced upon completing this project. Finally chapter 8 will conclude about this report and the production of the prototype.

1.5 Expected Result

There will be research about tea making manually to gain the idea of the design for the prototype. The design process must include the design of the motor function, electronic circuit and the design of the body layout of the prototype. This design process is to guide the production process onto the output of the machining process. As for this project, the expectation is to develop a machine for preparing “teh tarik” beverage. This machine will be expected to be light and portable to be easily handled. It must also be easily cleaned and user friendly. This will prepare the beverage at a short time while ease the user to do other job while waiting for the beverage to be prepared. The composition of the tea and temperature must also be perfect for drinking with the foam created above the tea. The machine must be sold at a reasonable price so that it can be bought by all the “teh tarik” beverage lovers.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter explains about the tea description in detail and the making of the teh tarik manually. The electric and electronic device and machining process that will be used in the prototype production will be explained in detail. Finally there will be explanation about material selection that will be used for the body of the prototype.

2.2 Tea Description

Tea is a beverage made by steeping processed leaves, buds, or twigs of the tea bush in hot water for a few minutes. The processing can include oxidation, heating, drying, and the addition of other herbs, flowers, spices, and fruits.

The four basic types of true tea are (in order from most to least processed):

- black tea
- oolong tea
- green tea
- white tea

The term "herbal tea" usually refers to infusions of fruit or of herbs (such as rosehip, chamomile, or jiaogulan) that contain no *Camellia sinensis* (Alternative terms for

herbal tea that avoid the word "tea" are tisane and herbal infusion.) Tea is a natural source of the amino acid theanine, methylxanthines such as caffeine and the bromine, and polyphenolic antioxidant catechins. It has almost no carbohydrates, fat, or protein. It has a cooling, slightly bitter, and astringent flavor.

2.2.1 Tea Plantation



Figure 2.1 Tea Plantation

The Cameron highlands are a major tea production area in Malaysia. There are several tea labels that contribute in tea making in Malaysia such as Boh, Lipton and brands. Figure 2.2 are the example of fresh tea leaves in plantation.



Figure 2.2 Tea leaves

2.2.2 Varieties of Tea

a) Black Tea

Black tea is the most common form of tea in Southern Asia (Sri Lanka, India, Pakistan, Bangladesh, etc.) and in the last century many African countries including Kenya, Burundi, Rwanda, Malawi and Zimbabwe. The literal translation of the Chinese word is *red tea*, which is used by some tea lovers. The Chinese call it *red tea* because the actual tea liquid is red. Westerners call it *black tea* because the tea leaves used to brew it are usually black. The oxidation process will take between two weeks and one month. Black tea is further classified as either *orthodox* or as *CTC* (*Crush, Tear, Curl*, a production method developed about 1932). Unblended black teas are also identified by the estate they come from, their year and the flush (first, second or autumn).

b) Green Tea

Green tea is a "true" tea, meaning it is made solely with the leaves of *Camellia sinensis*, that has undergone minimal oxidation during processing. Green tea originates from China and has become associated with many cultures in Asia from Japan to the Middle East. Recently, it has become more widespread in the West, where black tea is traditionally consumed. Many varieties of green tea have been created in countries where it is grown that can differ substantially due to variable growing conditions, processing and harvesting time. Over the last few decades green tea has begun to be subjected to many scientific and medical studies to determine the extent of its long-purported health benefits, with some evidence suggesting regular green tea drinkers may have lower chances of heart disease and developing certain types of cancer

c) Oolong Tea

In Chinese, semi-oxidized teas are collectively grouped as blue tea, while the term "oolong" is used specifically as a name for certain semi-oxidized teas.