

UNIVERSITI TEKNOLOGI MARA

**DESIGNATION, ANALYSIS AND
FABRICATION OF PORTABLE
COCONUT GRATING MACHINE**

NUR KHAIRINA IZZATI BINTI ISMAIL

Dissertation submitted in partial fulfillment
of the requirements for the degree of
Diploma
(Mechanical Engineering)

College of Engineering

Feb 2023

ABSTRACT

This project is presenting the portable coconut grating machine that primarily intended for home usage. The coconut grating machines that commonly available on the market need user to hold the coconut half-shell against a rotary blade, which is normally powered by an electric motor. Due to the user's hands being so close to the grater blade, this is highly risky. Plus, most of the currently available machines are big and expensive. Two main objectives for this project are the machine will be created with high safety factor and affordable for people to buy. This grating machine will be fabricated based on the finalized design. The results obtained from this machine is the design and analysis well organized enough to provide grating rate and low breaking rate. In conclusion, this study explains how this portable coconut grating machine was modified to address the well-known issues of grating coconuts.

ACKNOWLEDGEMENT

I want to express my gratitude and acknowledgement to my supervisor Dr. Suhadiyana binti Hanapi who made this work possible. I was able to complete all my project's writing stages thanks to her direction and counsel. Additionally, I want to thank the members of my committee for making my defense a fun experience and for their insightful comments and ideas.

Finally, I want to express my thankfulness to my entire family for their unwavering support and tolerance as I conducted my research and wrote my project. Your supplication for me has kept me going so far.

TABLE OF CONTENTS

	Page
CONFIRMATION BY SUPERVISOR	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
CHAPTER ONE : INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives	2
1.4 Scope of Study	2
1.5 Significance of Study	3
CHAPTER TWO : LITERATURE REVIEW	4
2.1 Benchmarking/Comparison with Available Products	4
2.2 Related Manufacturing Process	5
2.3 Sustainability/Ergonomic Related Items	8
2.4 Patent and Intellectual Properties	13
2.5 Summary of Literature	14
CHAPTER THREE : METHODOLOGY	15
3.1 Overall Process Flow	15
3.2 Detail Drawing	16
3.3 Engineering Calculation and Analysis	17
3.4 Bill of Materials	18

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Every new piece of technology finds a way to make our lives a little easier. Time is money in the twenty-first century, thus any piece of technology that helps us save time is considered essential. In this project, the portable coconut grating machine was modified to address the well-known issues of grating coconuts.

Coconuts are a popular fruit all around the world. They offer a wide range of applications as well as health and nutritional advantages. Coconuts are used for a variety of things, including cooking and nourishment, as well as skin health, cancer prevention, beauty items, and fuel. Coconuts are cracked with a hammer or knife in small-scale coconut processing. Hand tools or mounted-type coconut grater are used to extract the kernel is quite dangerous.

This portable coconut grating machine use motor to rotate the grating blade. While rotating, the dehusked coconut half-shell is forced against the sharp bit. The user must pay close attention because a slip could result in serious harm. To keep the half-cut coconut in place, the technique uses a shaft with a holder. Mounts made specifically for this holding shaft keep it in place. A frame is also constructed to hold the entire device. Another shaft is fixed horizontally on the other side, with a scraping tool attached to one end. A motor is attached to the shaft on the other end.

All this while, coconuts have been grated in the same method for decades. Therefore, the design presented in this paper is predicted to greatly reduce coconut scraping and more importantly, mitigate work-related dangers.