

UNIVERSITI TEKNOLOGI MARA

**DESIGN , ANALYSIS AND
FABRICATION OF PEDAL
POWERED WASHING MACHINE**

**AZLAN SHAH BIN KAMARUL
KALAI**

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

College of Engineering

Feb 2023

ABSTRACT

This project is to help people to save money, save time, and for people who lives in rural area. Due, to people who lives in rural area don't usually have stable electricity and to cut their cost for laundry because it relates with electric and water bills. The objectives for this project are to design and analysis an efficient pedal powered washing machine and to fabricate the pedal powered washing machine similar according the design made. Then , the methodology that been use is Morphological Analysis to generate the final design, internet for research and journals as my guidance to ease my work. The results that should appear is how the machine can function well and it's fabrication. In conclusion, this project should succeed it's fabrication and the dissertation as expected in within this semester .

ACKNOWLEDGEMENT

Firstly , I wish to thank Allah SWT for giving me the opportunity to embark on my diploma and for completing this long and challenging journey successfully .Then, I have to thank myself because of the effort and time that had been put to finish this dissertation and the free times that sacrificed to go workshop for the project. I also want to thank the lecturers that help me by their consultations and suggestions on how to fabricate my project without any problems.

In addition, I want to thank the PJ's / assistant engineer at the workshop because they help me a lot in fabrication, advise and encourage me to go workshop whenever I am free. Furthermore, I also want to thank my friends that support me by sending me to hardware shop when I need to buy any materials there andthey always waits for me at the workshop until I am done. Although they did not have anything to do with their project.

Not only that, I want to thank my SV, Nor Liawati binti Othman who always guide, help and assist me on anything about my prototype and paperworks/dissertation and logbook.

Finally, this dissertation is dedicated to my father and mother for the vision and determination to educate me. Also, thanks to my parents for lending me money to fabricate my final year project and always ask about my progression of my prototype. This piece of victory is dedicated to both of you. Alhamdulillah.

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	iv
LIST OF ABBREVIATIONS	xi
CHAPTER ONE : INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	1
1.3 Objectives	1
1.4 Scope of Study	2
1.5 Significance of Study	2
CHAPTER TWO : LITERATURE REVIEW	3
2.1 Benchmarking/Comparison with Available Products	3
2.2 Related Manufacturing Process	6
2.3 Sustainability/Ergonomic Related Items	8
2.4 Patent and Intellectual Properties	10
2.5 Summary of Literature	12
CHAPTER THREE : METHODOLOGY	14
3.1 Overall Process Flow	14
3.2 Detail Drawing	17
3.3 Engineering Calculation and Analysis	22
3.4 Bill of Materials	25

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Garments and clothes are either hand-washed or laundered in powered laundry washers. Washing machines are quite important in households, as well as in various business industries and hospitals. This has been either a highly rigorous and time-consuming procedure or a costly method over the years. A washing machine is a machine that is used to clean or wash linens such as towels, garments, and bedding. Washing machines are often powered by electricity. But, for this project it is powered by pedal and need humanpower to operate it. In addition, this project is aim to be mobile where the users can easily move the machine anywhere, they wanted.

1.2 Problem Statement

Due to high cost by using the normal washing machine the bill price will increase by how much usage by the users. So, this project is to help people who cannot afford to pay high bill payments and people who cannot afford to buy washing machines. One of the reason why this project can help people is because this project doesn't require a motor or electricity to power it up. Only humanpower is required to operate this machine and the mechanical element in this washing machine is called belt or pulley as transmission to the machine .

1.3 Objectives

The main objectives of this project are:

- a) To design and analyze an pedal powered washing machine
- b) To fabricate the pedal powered washing machine similar according to the design made