

**UNIVERSITI TEKNOLOGI MARA**

**DEVELOPMENT OF MECHANICAL  
PATHWAY CLEANER**

**AHMAD ADHAM IRFAN BIN NASRULLAH**

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

**College of Engineering**

**Feb 2023**

## **ABSTRACT**

Nowadays, almost all of pathway cleaner out there is fueled by either petrol or diesel. If the workers are cleaning the pathway during peak hour, the people who walk around the pathway will be uncomfortable because of the smell coming from the smoke of the usual pathway cleaners that they are using. This fabrication of mechanical pathway cleaner will benefit both of the parties above since it is very environmental-friendly. Basically, the mechanical pathway cleaner will look like a usual lawn mower. The work mechanism of this project is there will be a bigger sprocket connected at the rear tyre rod and a smaller sprocket connected to brush rod. The chain attached to the sprocket will rotate the brush when the pathway cleaner move forward. The rotating brush will collect the dried leaves and rubbish. It comes with a removable collector made from metal sheet and this will ease the user to dump the collected rubbish at any desired place.

## **ACKNOWLEDGEMENT**

Firstly, I wish to thank Allah for giving me the opportunity to embark on my diploma and for completing this long and challenging journey successfully.

My utmost gratitude and thanks go to my supervisor, Ir. Ts. Haszeme Bin Abu Kasim.

Finally, this dissertation is dedicated to my father and mother for the vision and determination to educate me. This piece of victory is dedicated to both of you.

To all my friends that are helping throughout this journey, I will never forget all your deeds. Lastly, I want to congratulate myself on being able to complete this journey successfully. Alhamdulillah.

# TABLE OF CONTENTS

	<b>Page</b>
<b>CONFIRMATION BY SUPERVISOR</b>	<b>ii</b>
<b>AUTHOR'S DECLARATION</b>	<b>iii</b>
<b>ABSTRACT</b>	<b>iv</b>
<b>ACKNOWLEDGEMENT</b>	<b>v</b>
<b>TABLE OF CONTENTS</b>	<b>vi</b>
<b>LIST OF TABLES</b>	<b>viii</b>
<b>LIST OF FIGURES</b>	<b>ix</b>
<b>LIST OF ABBREVIATIONS</b>	<b>x</b>
<b>CHAPTER ONE : INTRODUCTION</b>	<b>1</b>
1.1 Background of Study	1
1.2 Problem Statement	1
1.3 Objectives	2
1.4 Scope of Study	2
1.5 Significance of Study	3
<b>CHAPTER TWO : LITERATURE REVIEW</b>	<b>4</b>
2.1 Benchmarking/Comparison with Available Products	4
2.2 Related Manufacturing Process	6
2.3 Sustainability/Ergonomic Related Items	9
2.4 Patent and Intellectual Properties	9
2.5 Summary of Literature	10
<b>CHAPTER THREE : METHODOLOGY</b>	<b>11</b>
3.1 Overall Process Flow	11
3.2 Detail Drawing	13
3.3 Engineering Calculation and Analysis	18
3.4 Bill of Materials	25

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of Study

Nowadays, the rise of technologies made engineer looking for a way to replace engine powered products. It is to cut the spending cost and simultaneously can keep our environment clean. So, even without engine, the mechanical pathway cleaner is designed to replace the use of leaf blower. This designated project aims to create a very environmentally friendly pathway cleaner.

Main objectives of this project are to design and fabricate a mechanical pathway cleaner which can function better than any other existing pathway cleaning products. This project also can reduce the human efforts while cleaning the pathway.

A whole new design and innovation will be used in the production of this fully mechanical pathway cleaner. This project will look like a lawn mower which are available in the market right now and functioning as a leaf blower. At the back of this cleaner will be a removable box that function as leaf collector and can be removed to clear the leaf when it is full.

### 1.2 Problem Statement

In this current living, most of the people used the handheld leaf blower to clean the pathway. This blower is a common machine which consume regular petrol that can affect our environment. The leaf blower usually weighted about 8kg – 12kg. The price also quite expensive, for regular fuel-powered leaf blower, the starting price are from RM200 – RM500. The price is not reasonable since it just a one purpose machine.