

UNIVERSITI TEKNOLOGI MARA

**DESIGN, ANALYSIS
AND FABRICATION
OF MINI CAR
AUTOMATED ROAD
AND FLOOR DUST
CLEANING
MACHINE**

HEDZRY SHAFRY BIN REDZUAN SHAFRY

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

College of Engineering

March 2022

ABSTRACT

Mini Car Automated Road And Floor Dust Cleaning Machine is a prototype that will help people to do their cleaning process easier. This is because cleaning could take a lot of human effort and time such as sweeping, mopping and more. The function of this machine is collecting debris such as dried leaves, dusts, rubbishes while moving automatically. The machine will move in the straight line while the brush rolls the debris such as dusts and dried leaves into the container inside the machine. Cleaning manually such as sweeping and mopping could take a lot of energy and work. With this prototype, the user will only need to adjust the position of the prototype and let the machine do the cleaning. This will ease the user and prevent any unnecessary injuries in long term such as back pain, sore body and more. Besides that, cleaning manually could take a lot of time especially while cleaning big areas. With this machine, we can save time and do the cleaning activities systematically. The users will only need to take out the container that has collected the debris and dispose it easily. Hence, this prototype will increase the work efficiency for the cleaning activities. Besides that, this prototype will help people to clean their environment easier because the cleaning activities will take less effort and time. This will make the environment around the community cleaner. Besides that, this prototype will help the cleaners that work for hours at cities, schools and universities on cleaning manually especially when cleaning big areas. With the help of this prototype, it will lighten the burden thus making the cleaning work easier but efficient.

ACKNOWLEDGEMENT

Alhamdulillah, first of all I would like to express my deepest appreciation and gratitude to Allah S.W.T for the guidance that help me go through a lot of challenges while finishing this proposal especially during this Covid-19 pandemic. I would also like to thank to the people who have guided me in this project as I am finally able to finish and complete our task that has been assigned. The completion of this final year project went well with the support from my parents, lecturers, seniors and peers. I would like to thank my family especially my parents, Redzuan Shafry B. Rosdi and Haniza Bt. Zailah that have provided me the needs and facilities to finish this project such as a conducive study area, internet connection, privacy and more. With their cooperation and consideration, I am able to study comfortably and finish my work at home. I would honor all my respect and gratitude to my parents for their help. In addition, I would like to express my appreciation to our respected Lecturer In Charge for MEC299 and Supervisor, Dr. Suhadiyana Hanapi that has given me useful advice and guidance throughout this project. Her guidance helps me to select the title for this project and also the methods to write the proposal. She always replies to my messages and guide me to produce a proper proposal. Moreover, I would like to express my gratitude to Sir Amir Badang that has helped me on picking the materials for my prototype. I would also like to thank Sir Wan Muhammad Syahmi that has helped me on fixing my laptop startup and also providing us a video for Solidworks Simulation. Furthermore, I would also like to express my gratitude to my senior, Muhammad Danish Iman for helping and guiding me on how to write the proposal. With his help, I have able to learn on how to install and use the Solidworks software on my laptop. Last but not least, I would like to thank my friend, Muhammad Danial Bin Zuhri as he helped me on correcting my format of my proposal. With his guidance, I have learned a lot on how to use Microsoft Words the right way to write a proposal in a good format.

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
CHAPTER ONE : INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives	3
1.4 Scope of Work	4
1.5 Significance of Study	5
1.5.1 Customer's Requirement	5
1.5.2 Analysis Of Survey	6
1.6 Expected Results	9
CHAPTER TWO : LITERATURE REVIEW	10
2.1 Introduction	10
2.2 Early Methods	10
2.3 Product Design Specification	10
2.3.1 Prototypes by M. Ranjit Kumar	10
2.3.2 Prototypes by Rizwan Sheikh	14
2.3.3 Existing Products	18

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Cleaning is a process of removing unwanted substances such as dirt, infectious agents, and other impurities, from an object or environment” [17]. Cleaning is also typically a time-consuming, monotonous, and repetitive task [4]. Cleaning and sanitising effectively benefits and protects human health both directly and indirectly. Cleaning and sanitising also helps to minimise pest infestations by decreasing leftovers that attract and support bees, vermin, and other insects [7]. Regular cleaning and care extend the life of the floor, walls, and other surfaces. However, there is no single cleaning procedure that is appropriate for all locations and circumstances, and effective cleaning is dependent on the type of cleaning device, cleaning procedure, and user-friendliness of the equipment.

In recent years, most individuals choose to commute by rail or bus, and as a result, these areas are strewn with biscuit wrappers, cold drink bottles, and other items. As a result, it is vital to clean bus stops and train stations on a regular basis [7].

Furthermore, schools, buildings, universities, and city areas are also strewn with not only litters but also dried leaves, rubbishes and more. As we know, most of the areas are cleaned by the cleaners manually by sweeping. It requires a lot of human energy, time and work to do the cleaning process. Because of this it will be take a lot of human’s work, energy and time to maintain the cleanliness of the places on the regular basis. Companies will also need to hire more workers and cleaners to solve this problem.

Besides that, there are also many people that have problems to clean their house compound while sweeping. Most of the people have a busy schedule and do not have enough time to do their cleaning activities. This will lead to more pest infestations in the environment [7]. Most of the people uses the manual method to clean their house which is sweeping, raking and more.