

UNIVERSITI TEKNOLOGI MARA

**DESIGN, ANALYSIS, AND FABRICATION OF
MULTIFUNCTION PICK UP TOOL**

NURUL IZZATUL BINTI AZIAN

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

College of Engineering

March 2022

ABSTRACT

This dissertation is presenting a tool that can help to make the environment clean and conducive to live without any littering happen. By using this multifunction pick-up tools, it can make the garbage easier to pick even in the dark area or in the place that make the garbage difficult to reach. It is because this product will include all the needed tool such as claw to pick up items and LED light for lighting. It will also have a comfortable grip so people can use it for a long working time and that make it even better compared to another basic pick-up tool. Other than that, this dissertation discusses about some comparison of pick-up tool, material used, and detail drawing so that it is easier to observe the most suitable design to fabricate the product. Some calculation and analyses also have been conducted that focus on the spring to make sure that the spring will compressed and then return to its original state. It is because spring is the main part for this tool, which will help to open the claw when the force is applied. Moreover, this dissertation will include the product capability in doing some tasks. It is to ensure that the product can be used and function well within the analysis that had been done. It also has their own specification, advantage, and disadvantage when the task has been done. From that, some improvement can be made for the sake of future user. Then, the product manual operation regarding on this multifunction pick-up tool also will be one of the parts in this dissertation so that it can provide people on how they can use this tool properly. In conclusion, this multifunction pick-up tool can give benefits to the environment and points of view need to be considered to the people who will working with it.

ACKNOWLEDGEMENT

Throughout the writing of this dissertation, I have received a great deal of support and assistance from many sides. 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. Alhamdulillah.

My gratitude and thanks go to my supervisor, Dr. Azizul Hakim bin Samsudin, whose skill was invaluable in provided the research question and methodology for my project. Your feedback pushed me to sharpen my thinking and successfully complete my Final Year Project (FYP). I also show my gratitude to all kind of lecturers in Mechanical Engineering Department for their help direct or indirect contribution upon completing my project either in product or dissertation.

Next, not to forget to my fellow friends especially Wan Zahra' Mardiah, Nur Kameelah, and Aleesa Natrah for supporting me throughout these two semesters, practically and with moral support. To complete my study during this pandemic required me to be more independent and disciplined person. However, with the valuable motivation and suggestion from them, this challenging journey become easy and more memorable memory have been created between us at UiTM Pasir Gudang.

Most importantly, this dissertation is dedicated to my parents for the vision and determination to educate me as well as their wise counsel and sympathetic ear. I could not have completed this project without all the love and strength you both have given me to reach for the stars and chase my dreams. This piece of victory is dedicated to both of you. My only little sister also deserves my wholehearted thanks as well. Thank you for willing to face the temperament of mine along this journey to complete my FYP. Thank you to all and alhamdulillah.

TABLE OF CONTENTS

	Page
CONFIRMATION BY SUPERVISOR	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xii
CHAPTER ONE: INTRODUCTION	2
1.1 Background of study	2
1.2 Problem statement	2
1.3 Objectives	3
1.4 Scope of work	3
1.5 Significance of study	4
CHAPTER TWO: LITERATURE REVIEW	5
2.1 Information on existing product, patents, and standards	5
2.2 Product design specification	9

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

In today's world, millions of garbage are thrown out each year and have affected our environment where it is being found everywhere in our daily life. Although, the garbage can be cleaned regularly but it only limited to garbage in open spaces. Garbage that gets stuck in the place that make it difficult to clean such as small hole, drain, or piping system nearby the road make the condition of the environment worsen day by day. Due to that, a major problem could result whether in health, space, or economic. Therefore, I designed this multifunction pick-up tool to solve the problem from getting worse where it can pick up either small garbage that gets stuck in a small hole or trash that difficult to reach by hand. By using this tool, environment can be cleaner, and people can live in a conducive lifestyle.

1.2 Problem Statement

As we know, basic garbage pick-up tool can collect big garbage and be used in open space-however trash that difficult to reach by hand or get stuck in confined spaces like small hole or tube cannot be reached using that tool. As the result, the cost will be high due to many other tools needed to be used to take out a single trash at a time. Furthermore, the tool did not consist of light which make it uneasy to work with in the dark.

On top of that, littering that happens nowadays is worrying as it affects people to have a conducive environment and healthy lifestyle. Major problems either in health or economic also become worse due to that.