

UNIVERSITI TEKNOLOGI MARA

**DESIGN AND FABRICATION OF
FLOOR CLEANING DEVICE**

**AHMAD AIMAN BIN ROSLAN
(2021212178)**

Diploma

January 2024

ABSTRACT

Recently, many people facing a problem relate to cleanliness especially people who work in commercial industry and food service industry. Every place needs to have a cleaning tool at their place to make sure the cleanliness at their place maintained. The current cleaning method may not provide the best cleaning results and time-consuming. During closing hour, it will take time to make sure the floor is clean, and it use a lot of energy. The objective of this project is to design a floor cleaning device using solidwork software and to fabricate a floor cleaning device to reduce physical strength. As a result, the floor cleaning device with ergonomic design, high durability material, cost-efficiency and user-friendly will be produce. Hopefully, from this project may help the worker in the commercial industry and food service industry to reduce time consuming for cleaning process, minimize the physical injury during the process and can reduce cost effectively.

ACKNOWLEDGEMENT

Firstly, I wish to thank God for giving me the opportunity to embark on my diploma and for completing this long and challenging journey successfully. My gratitude and thanks go to my supervisor, Mrs. Ros Atikah Binti Abdul Kadir.

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. Alhamdulillah's.

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
CHAPTER ONE : INTRODUCTION	11
1.1 BACKGROUND OF STUDY	11
1.2 PROBLEM STATEMENT	12
1.3 OBJECTIVES	12
1.4 SCOPE OF WORK	12
1.4.1 PROJECT OVERVIEW	12
1.4.2 RESEARCH AND ANALYSIS	12
1.4.3 DESIGN AND DEVELOPMENT	13
1.4.5 PROJECT MANAGEMENT	13
1.5 SIGNIFICANCE OF STUDY	13
1.5.1 EFFICIENT CLEANING	13
1.5.2 USER-FRIENDLY DESIGN	13
1.5.3 COST-EFFECTIVENESS	13
CHAPTER TWO : LITERATURE REVIEW	14
2.1 INTRODUCTION	14
2.2 PRODUCT DISSECTION OF FLOOR CLEANING DEVICE	14
2.2.1 BODY	14
2.2.2 CLEANING HEAD	14
2.2.3 PUMP	14
2.2.4 WATER TANK	14

2.3	PATENT STUDY OF FLOOR CLEANING DEVICE	15
2.3.1	MANUALLY OPERATED SWEEPER	15
2.3.2	FLOOR CLEANING MACHINE	16
2.3.3	MANUAL SCRUBBER WITH VACUUM PICK-UP	17
2.4	BENCHMARKING OF FLOOR CLEANING DEVICE	18
CHAPTER THREE : METHODOLOGY		19
3.1	FLOW CHART	19
3.2	PRELIMINARY RESULT	20
3.2.1	CUSTOMER REQUIREMENT	20
3.2.2	HOUSE OF QUALITY	22
3.3	PRODUCT DESIGN SPECIFICATION	23
3.4	PHYSICAL DECOMPOSITION	25
3.5	FUNCTIONAL DECOMPOSITION	26
CHAPTER FOUR : RESULTS AND DISCUSSION		27
4.1	INTRODUCTION	27
4.2	MORPHOLOGICAL TABLE	27
4.2.1	CONCEPT 1	29
4.2.2	CONCEPT 2	30
4.2.3	CONCEPT 3	31
4.2.4	CONCEPT 4	32
4.2.5	CONCEPT 5	33
4.2.6	PUGH TABLE	34
4.3	PRODUCT ARCHITECTURE	35
4.4	CONFIGURATION DESIGN	36
4.5	PARAMETRIC DESIGN	37
4.5.1	FAILURE MODE AND EFFECT ANALYSIS	37
4.6	DRAWING DESIGN	38
4.6.1	DETAIL DRAWING	38
4.6.2	ASSEMBLY DRAWING	39
4.6.3	EXPLODED DRAWING	40
4.6.4	FINAL DESIGN	41