# UNIVERSITI TEKNOLOGI MARA

# DESIGN AND FABRICATION OF IMPROVED DRUM COFFEE ROASTER FOR HOME APPLICATION

# **ADAM DANIAL BIN BIDIN**

## **DIPLOMA**

**JANUARY 2024** 

#### **ABSTRACT**

This project is about a drum coffee roaster for home application and a design of chaff sucker that will be attach at the drum coffee roaster. Nowadays drum coffee roaster has many problem that make the coffee bean get burn such as excessive chaff. The aim for this project is to design a fan like chaff sucker that can suck the excessive chaff while the coffee bean get roasted. This chaff sucker will make the drum coffee roaster more efficient for home application. For this project I will use welding method to make the chaff sucker's body and some electrical method for the motor to make the fan rotated. While I do the research for this project I found that the drum coffee roaster also can be automatic so I will make the drum rotate automatically using motor. In a nutshell, this project will using a existing drum coffee roaster and the chuff sucker will be added to make the drum coffee roaster more efficient for home application.

#### **ACKNOWLEDGEMENT**

I praise Almighty Allah for giving me the strength and patience to complete this final year project. I would like to express my sincere appreciation and deepest gratitude to the following persons for their support during my final year project. This final year project will provide a lot of benefits to me in terms of knowledge and experience while doing final year project and in the future.

I, Adam Danial bin Bidin, would like to thank and highly appreciate my lecturer and also my supervisor Mr. Matzaini bin Katon for never tired of giving guidance and encouragement. Mr. Matzaini also help to review data, reports and make remarks in order to obtain excellent result for this final year project.

I would also like to thank you both my parents, Bidin bin Ahmad and Azizah binti Abdullah and also my family who also helped me to complete this final year project. Without their support I might not be able to complete my final year project. This is because the work to complete this final year project requires motivation, effort, patient and ideas.

## TABLES OF CONTENTS

	Pa	age			
CO	NFIRMATION BY SUPERVISOR	ii			
AUTHOR'S DECLARATION  ABSTRACT  ACKNOWLEDGEMENT  TABLE OF CONTENTS  LIST OF TABLES  LIST OF FIGURES		iii			
		iv v vi viii ix			
			LIS	T OF ABBREVIATIONS	X
			СН	APTER ONE: INTRODUCTION	1
			1.1 1.2 1.3 1.4 1.5	Background of study Problem Statement Objectives Scope of Work Significance of Study	1 2 2 3 3
			СН	APTER TWO : LITERATURE REVIEW	4
2.1I	Introduction to Improved Drum Coffee Roaster	4			
2.2]	Product Dissection of An Improved Drum Coffee Roaster for Home Application	n 5			
,	2.2.1 Introduction	5			
4	2.2.2 Part of Product	5			
4	2.2.3 Product Operation	6			
2	2.2.4 Product Making	6			
2	2.2.5 Conclusion	6			
2.3 ]	Patent Study	7-16			
2.4]	Benchmarking	17			
2.5	Conclusion	17			

CHAPTER THREE: METHODOLOGY	18
3.1 Flow Chart	
3.2 Preliminary Result	
3.2.1 Customer Requirement	19
3.2.1.1 Survey	19-20
3.2.1.2 Interview	21
3.2.2 House of Quality	22
3.2.3 Product Design Specification	23
3.2.4 Product Decomposition	24
3.2.5 Physical Decomposition	25
3.2.6 Morphological Table	26
3.2.6.1 Concept 1	27
3.2.6.2 Concept 2	28
3.2.6.3 Concept 3	29
3.2.6.4 Concept 4	30
3.2.6.5 Concept 5	31
3.2.7 Pugh Table	32
3.2.8 Product Architecture	33
3.2.9 Configuration Design	34
3.2.9.1 Component to Buy or to Fabricate	34
3.2.9.2 Fabricate Stand Frame	35
3.2.9.3 Fabricate Drum	35
3.2.10 Parametric Design	36
3.2.10.1 Failure Mode and Effect Analysis (FMEA)	36
3.3 Gantt Chart	37