DEVELOPMENT OF CONVEYOR FOR LAB SCALE COMBUSTION CHAMBER (PALM SHELL FEED ANALYSIS)

ABDUL AZIZ BIN IBRAHIM
(2002334570)

A final year project report submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering (Hons) Mechanical

Faculty of Mechanical Engineering
Universiti Teknologi Mara (UiTM)

NOVEMBER 2005

ACKNOWLEDGEMENT

First of all, I would like to express the highest gratitude to Allah the Almighty as give me strength, capability and willingness in completing this project.

I would like to express my sincere gratitude to the advisor of this project, Mr. Wan Ahmad Najmi B. Wan Mohamed for his continue support, generous guidance, patience, and encouragement during the duration of the thesis preparation until its completion.

I would like to express the highest appreciation to all workshop technicians especially to Encik Johari and Encik Fazly for helping and teaching me in operating machines in the workshop.

My appreciation goes to my partner, Sharolfizan who had give commitment and ideas throughout the project. I hope this project offered great experienced both for me and him. Special thanks go to my family, my classmates, my friends and all who supported in completing this thesis.

ABSTRACT

The Project of 'Development of Conveyor for Palm Shell' has been carried out by the final year students of Bachelor of Engineering (Hons.) Mechanical, under the supervision of Mr. Wan Ahmad Najmi Bin Wan Mohamed. The project aimed to develop a practical conveyor for transporting palm shell into designed combustion chamber for research and evaluation, and also acts as a platform in order to give uniform capacity and suitable feed rate of palm shell into combustion chamber for combustion process. The development included three stages, namely design, fabricated and testing. The conveyor is inclined belt conveyor type and was made using rough top belt as its transporting belt. Results from the test using palm shell as a fuel showed reliable performance confirming with the design specification with some areas for further improvements.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

1.0 Introduction

The main purpose of this project is to develop a conveyor for transporting biomass fuel (palm shell) to small scale combustion chamber that was designed by previous semester student. Several parameters can be evaluated through this project such as the efficiency of the conveyor to transport the palm shell into small scale combustion chamber, belt conveyor speed, suitable tank gate opening respect to ideal feed rate palm shell for combustion process and distribution of palm shell in combustion chamber.

A conveyor is a part of materials handling systems. Material handling is the preparation, placing, and positioning of materials to facilitate their movement or storage. It includes every consideration of the product except the actual processing operation and, in many instances, is included as an integral part of the process. Mechanical handling split into two main categories, bulk handling (palm fiber, grain, coal, ore) and package handling.

Conveyor is a machine that transfers a load or objects between two points by a moving surface. The direction of movement can be horizontal, inclined, declined and