

DESIGN OF MINI COCONUT FIBER CRUSHER AND SCREENING MACHINE

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**DESIGN OF MINI COCONUT FIBER CRUSHER
AND SCREENING MACHINE**

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**A report submitted in fulfilment of the requirement for the
Bachelor of Mechanical Engineering**

FACULTY OF MECHANICAL ENGINEERING

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DECLARATION

I declare that this report entitled “Design of Mini Coconut Fiber Crusher and Screening Machine” is the result of my own work except as cited in the references.

Signature :

Name : Ahmad Khuzairi Bin Abu

Date :

APPROVAL

I hereby declare that I have read this project report and in my opinion, this report is sufficient in term of scope and quality for the award of the degree of Bachelor of Mechanical Engineering (Design & innovation).

Signature :

Supervisor's Name : Prof Madya Ir. Dr. Abdul Talib Bin Din

Date :

ABSTRACT

Mini coconut fiber crusher and screening machine is a machine that crushing and screening a coconut fiber for the purpose of agriculture and other industry. There are few companies or enterprises are producing coconut fiber crusher and screening machine in Malaysia but the size of the machine is big. The objective of this project is to design and create a mini coconut fiber crusher and screening machine where producing a product in form of coco fiber and coco peat. This machine focuses on a machine in a small size, affordable for personal used and product produced in a small scale. The basic principle of the machine operation is a coconut fiber is throw into hopper where it cause the coconut fiber fall into a crushing compartment which is upper body. The upper body of this machine consist of blade, blade holder, shaft, small pulley and semi drum. During crushing process, the coconut fiber is hammer and cut to form coco peat and coco fiber. All the product pass through the semi drum. The purpose of semi drum is to filter or segregate the partial crush coconut fiber from fall into a coco fiber drawer. The uncomplete crush coconut fiber will continue crush until it can pass through the semi drum. In the coco fiber drawer, there is a wire mesh acting as filter of coco peat. The wire mesh only allow a coco peat pass through it while the coco fiber remain inside the coco fiber drawer.

ABSTRACT

Mesin penghancur dan penyaring sabut kelapa mini ialah sebuah mesin untuk menghancurkan dan menyaring sabut kelapa untuk tujuan pertanian dan industry lain. Terdapat beberapa syarikat atau usahawan yang menghasilkan mesin penghancur dan penyaring sabut kelapa di Malaysia tetapi saiz mesin tersebut adalah besar. Objektif bagi projek ini adalah mereka bentuk dan menghasilkan sebuah mesin penghancur dan penyaring sabut mini di mana produk yang dihasilkan dalam bentuk coco peat dan coco fiber. Mesin ini memfokuskan mesin dalam bentuk yang kecil, mampu milik untuk kegunaan peribadi dan produk yang dihasilkan dalam skala yang kecil. Prinsip asas bagi operasi mesin ini adalah sabut kelapa akan dicampakkan di dalam corong dimana sabut tersebut akan jatuh ke dalam ruangan penghancur iaitu badan atas. Bahagian atas mesin terdiri daripada bilah, pemegang bilah, aci, puli kecul dan semi drum. Semasa process penghancuran, sabut kelapa akan dikutuk dan dipotong untuk menghasilkan coco peat dan coco fiber. Semua produk yang terhasil akan melalui semi drum. Tujuan semi drum adalah untuk menapis atau memisahkan sabut kelapa yang hancur separuh daripada jatuh ke dalam laci coco fiber. Sabut kelapa yang tidak hancur akan terus dihancurkan sehingga ia lepas untuk melalui semi drum. Di dalam laci coco fiber, terdapat jarring wayar yang bertindak sebagai penapis untuk coco peat. Jarring wayar tersebut hanya membenarkan coco peat sahaja melalui nya manakala coco fiber kekal di dalam laci coco fiber.

DEDICATION

A special dedicated to my beloved parents, my final year project supervisor, Prof Madya Ir. Dr. Abdul Talib Bin Din, my lecturers, my family members and all my friends which have supported me in completing this project.

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LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE

HP	Horsepower
RPM	Revolution per minute
MOR	Modulus of rupture
MOE	Modulus of elasticity
CFB	Coco fiber board
MDF	Medium density board
QFD	Quality function deployment
AC	Alternating current
CAD	Computer aided design
LED	Light emitting diode
NO	Normally open
NC	Normally close
MIG	Metal inert gas

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CHAPTER 1

INTRODUCTION

This chapter covers the background of study, problem statement, objectives and project scope. The chapter overview is also included in this chapter.

1.0 Background

The use of coconut fiber waste is still limited due to lack of public awareness of the waste that has high selling value. For example, household handicrafts that used coconut fibers only a small portion, whereas the need for coconut fibers is very high such as beds, pillows, bolsters, brooms and the latest one it can be used as a composite instead of wood. In the largest engineering field application, we need modern technology that changes about the advantages of using coconut fibers as a technical application is where it can break down by the soil so it not lead to the environmental pollution.

Coconut fiber itself is the largest part of coconut fruit. Coconut fiber if processed optimally will produce coconut fiber with good quality, providing added value from a broom and doormat because it has its own appeal made from natural fibers because the physical and chemical properties of lignocellulose possessed by coconut fiber are in accordance with human needs. That coconut fiber is cheaper than other fibers and environmentally friendly. Coconut trunk can use as a small bridge to cross a trench or small river. Besides, coconut