

CHAPTER

10

MECHANICAL COCONUT HUSK PEELER

Nor Fasiha Mohd Yusof and Muhamad Aidil Misseri

10.1 INTRODUCTION

A coconut tree is famous for its various applications from different parts of the tree. The scientific name is *Cocos Nucifera*. The term comes from a Spanish word, coco that means head or skull. A coconut tree can grow up to 30m tall with an average of 50–200 coconuts annually.

The coconut itself has various kinds of usage. However, to use the parts, we need to peel away the husk from the skull. There are many types of coconut peeling tools and machines in the market. The tools or machines are varied about the capability to peel, the mechanism used, the cost, and the type of usage (personal or industrial). The users are mainly villagers who using them for domestic use, small the users are mainly villagers who using them for domestic use, small and moderate industries, retail shops, etc.

Tools or machines that are available in the market have their specific capabilities. Some need an electrical source, while some can be operated manually. The capacity is one of the concerns of the user when deciding which one to buy. Users from the industry would prefer tools or machines that have higher productivity. Meanwhile, users who are using it for personal purposes prefer the smaller capacity of tools.

10.1.1 Problem Statement

Coconut is a fruit used in our daily life either for cooking, medication, or business. The demand for this coconut never ends because of its multipurpose criteria. Background studies suggested that the tools for peeling coconut must be simple, not risky, and users can use it easily and quickly without prior training.

Most manual coconut peeler tools in the market are simple and can be used easily and quickly without prior training. However, the safety aspect is not applied. In addition, it is also difficult to peel the coconut due to the strength of the husk. Even by using tools, a strong force is needed to peel away the husk. Hence, a new design of coconut husk peeler that can overcome the above issues is required. The purpose of this study is to propose a concept design of a mechanical coconut husk peeler that is safe and easy to operate.

10.1.2 Objective

The purpose of this study is to propose a concept design of a mechanical coconut husk peeler that is simple, safe and easy to operate.

10.1.3 Scope and Limitation

The scope of this study is focusing on:

- (1) Study the existence of technologies of coconut peeling machine or tool.
- (2) Identifying problems and the need for improvement.
- (3) Development a new concept that generated based on product design specification.
- (4) The material and static analysis of the new concept.

10.2 DESIGN PROCESS

This section explains the conceptual design process.

10.2.1 Problem Identification

Problems are identified by performing critical background research and by understanding concepts from similar products. The focus is on the users' difficulties and the existing solutions.

10.2.2 Product Design Specification

Product design specification (PDS) need to be constructed to be a guideline for the design specification. Table 10.1 shows the PDS for this study.

Table 10.1 Product design specification

Specification	Description
User-friendly	Easy to handle without having prior training.
Low in Complexity	The structure of design should be simple and easy to understand.
Safe to Use	Allow user to use the product without risking their safety.
Low Cost	The material and manufacturing cost should not exceed RM100 per unit for industrial production
Portability	Easy to locate the product from one place to another without facing any difficulties.
Aesthetic	Simple look.
Sustainability	Provide environmental, social, and economic benefits.
Durability	The lifespan of the design is more than ten years.
Ergonomics	Must be parallel with human comfort.

10.2.3 Functional Analysis

Figure 10.1 shows the functional block that involves mechanisms in the coconut peeling process.