

DESIGN AND FABRICATION OF CEILING FAN BLADES CLEANER

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ABSTRACT

This thesis is based on the project about design and fabrication of ceiling fan blades cleaner. 'Ceiling fan blades cleaner' is device that can clean the top and bottom of surface ceiling fan blades. The fabrication of this product started with article review. All information about ceiling fan blades cleaner such as design, price, material that had been used for the product specification analysis, concept designing, detail concept designing and fabrication of the product. From the analysis, a new design of ceiling fan blades cleaner has been created. The investigation was made in scope of the constraint that may occur for the development of the product and relevance of the product manufacturing processes. This product have been fabricate according to fabrication process such as welding, cutting, drilling and assembling. For development of this project and future works, some suggestion was made for upgrading the product. The suggestion like the flexibility on these ceiling fan blades cleaner and more lightweight on the holder will competitive with the existing products in the market.

ABSTRAK

Projek Tahun Akhir ini adalah mengenai “ *ceiling fan blades cleaner*” yang merupakan alat yang digunakan untuk mencuci kipas siling samada dibahagian atas mahupun bahagian bawah bilah kipas siling. Proses penghasilan produk telah dimulakan dengan mengumpul segala maklumat yang berkaitan dengan pencuci kipas siling ini. Contohnya seperti reka bentuk, harga, bahan yang digunakan untuk menghasilkan produk, spesifikasi produk, reka bentuk konsep, reka bentuk konsep yang terperinci, dan penghasilan produk. Setelah dianalisis satu reka bentuk baru telah dihasilkan. Kajian di buat dengan melihat kesesuaian produk terhadap proses pengeluaran dan halangan yang timbul seperti ketiadaan bahan serta keadaan mesin di dalam menghasilkan produk ini. Produk ini dihasilkan melalui cara seperti mengimpal, memotong, menggerudi dan mencantum. Beberapa cadangan telah dibuat untuk menambahbaik produk tersebut. Diantaranya ialah dengan mereka bentuk pemegang supaya produk ini masih boleh disimpan di ruang yang kecil dan juga bahan produk tersebut mestilah menggunakan bahan yang lebih ringan untuk memastikan produk ini mampu bersaing dengan produk yang sedia ada di pasaran.

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CHAPTER 1

INTRODUCTION

1.1 Project Synopsis

1.1.1 General Project Synopsis

The project involves designing and fabricating ceiling fan blades cleaner. This cleaner would be entirely different from existing cleaner. As the Diploma final year project allocates the duration of 1 semester, this large man-hour project therefore requires significant efforts of the students to participate. Basically the entire Ceiling Fan Blades Cleaner could be divided into 3 stages, which are concept review and development, designing and fabrication.

The process of development is initiated from designing the shape of the ceiling fan blades cleaner by considering the function as well. In order to produce user friendly product that is suitable to the consumer, consideration to the others factor is taken into account.

1.1.2 Project Synopsis

The title of this project is “Ceiling Fan Blades Cleaner”. The project involves the designing and fabricating of the ceiling fan blades cleaner. The prototype is designed to achieve the crowd need and at the same time make some improvement to the existence products in market. In designing process, strength, durability and functional of product will be given high concern. Some modifications are required to give a different type of ceiling fan blades cleaner that exists in the market. After that, testing is needed to be done to make sure the adjustable ceiling fan blades cleaner is functional. The analysis of force that should be applied and grip force produced will be taken into account in order to accomplish this project.

This product could be used by every person that needs to clean the fan blades in their house, even offices and factories. This fan blades cleaner is simple. When force is given to the hand brake, the grip force is produced between a pair of sponges. All dust will stick to these sponges. The fan blades cleaner is safe, effective and easy to use.

During the designing process, several aspects have been given high concern to make sure the product is effective. Some renewal has been done to present the product to make it user friendly.

1.2 Problem Statement

- (a) Dust in blades-More power is needed to rotate the fan blades in normal condition.
- (b) High and out of reach.
- (c) Conventional method by using ladder and wool is a waste of time.
- (d) Unsafe/Dangerous while cleaning the ceiling fan blades.
- (e) Previous products in the market do not effectively

1.3 Project Scope

- (a) To design ceiling fan blades cleaner by using solid work software.
- (b) To fabricate ceiling fan blades cleaner by using engineering method such as drilling, welding etc

1.4 Project Objectives

1.4.1 General Project Objectives

Diploma final year project objectives are to apply the knowledge and skills of the student that have been gathered before in solving problem using academic research, to born an engineer that have enough knowledge and skills. This project also important to train and increase the students capability to plan their work properly, conducting research, collecting data, analysis making and then solve a problem by scientific research. These are well worth preparation before working in the real world.

1.4.2 Specific Project Objectives

The main objectives of this project are as follows:

- (i) To design ceiling fan blades cleaner.
- (ii) To fabricate ceiling fan blades cleaner.

1.5 Organization of the Project

This project mainly consists of five chapters. The first chapter is introduction which explains in detail about the title of the project, the scope of the thesis and the objectives of the project. The second chapter is literature review which discusses the methods and previous design that available in market. The third chapter is research methodology. In this chapter, the procedures and methods used to design and fabricate fan blades cleaner is discuss. The fourth chapter is result discussion which explains the product. The last chapter is conclusion which discusses the conclusions drawn based on the result on the result or product and the recommendations on future works.

1.6 Project Planning

Table 1.1: Gantt Chart

	Weeks														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Literature Review	■	■	■												
Methodology study				■	■	■	■								
Design & Sketching				■	■	■	■								
Material selection					■	■	■	■							
Fabrication									■	■	■	■			
Finishing & Improvement											■	■	■	■	
Report writing				■	■	■	■	■	■	■	■	■	■	■	
Presentation										■					■

■ Planning Progress

□ Actual Progress

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Cleaning devices of many shapes and sizes have been created for handling a variety of needs. Brooms, mops, and other devices grant the user safe access to the lower portion of the fan blades. In order to clean the upper side of these blades, the user are always expose to the potential hazards of using elevating devices and apparatuses. The present invention relates to cleaning devices and, more specifically, a device that allows a user to clean both the top and bottom of ceiling fan blades without the need for an elevating device of any kind.

2.2 Current Existed Fan Blades In Market

2.2.1 Ceiling Fan Steel Black

This ceiling fan has three black painted blades in 142 cm in diameter. This ceiling fan has 5 speeds by choke type regulator, and 18 pole hands made powerful heavy duty industrial motor with double ball bearings. This condition will guarantee have a longer life and silent running. Besides that it has reverse switch on the motor.

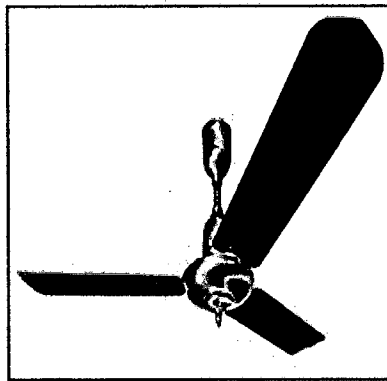


Figure 2.1: Ceiling Fan Steel Black

2.2.2 Ceiling Fan Varanasi's Secret Brass

This ceiling fan has 3 brass blades in 142 cm in diameter. It has 5 speeds by choke type regulator. The 18 pole hands made powerful heavy duty industrial motor with double ball bearings guarantees have a longer life and silent running. This type also has 5 speed wall mount regulator

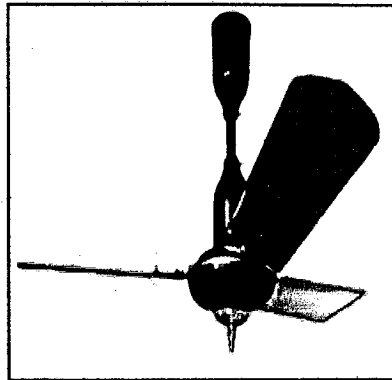


Figure 2.4: Ceiling Fan Varanasi's Secret Brass

2.2.4 Ceiling Fan Remida Oro

This is unique design where the blades are made from transparent Perspex. The structured on this ceiling fan is decorating by gold colored and silver leaf as the blades. The Perspex has 127 cm in diameter. The material for the motor of this ceiling fan is silicon steel. This ceiling fan speed can control by remote control or optional wall mount regulator.

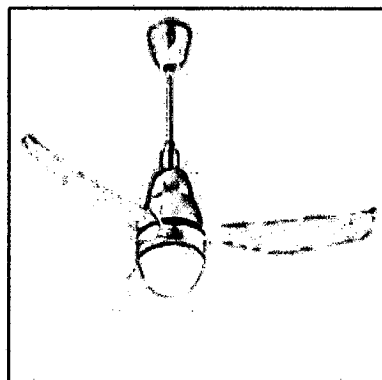


Figure 2.3: Ceiling Fan Remida Oro

2.2.5 Fanimation Ceiling Fan Mavrik

This Fanimation Ceiling Fan Mavrik is decorated with chrome colored. The material for the blades is wood. This ceiling fan also has limited lifetime for the motor. It builds in with lights. This ceiling Fan only has 4 speeds which are reverse and forward speeds.

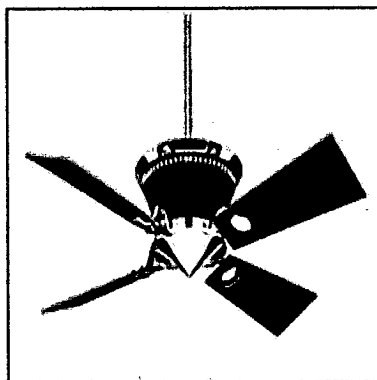


Figure 2.4: Fanimation Ceiling Fan Mavrik

2.3 Current Existed Fan Blades Cleaner In Market

2.3.1 Ceiling Fan Duster

The most popular current product that available in market is Ceiling Fan Duster. This design can reach the fan blades up to 5 foot, adjustable telescoping, and twist-and lock handle and oval shaped dusting head. The split-tip poly fibers grab the finest dust particles and cobwebs leaving the surface clean. The handle comes complete with a swivel-tip grip for off-the-floor storage.

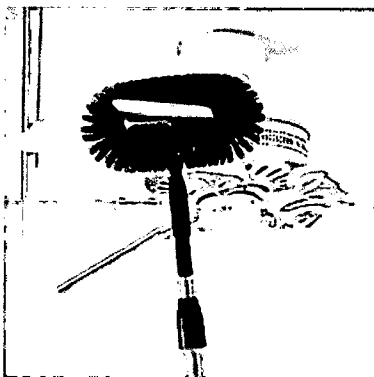


Figure 2.5: Ceiling Fan Duster

2.3.2 Telescoping Ceiling Fan Cleaner

Figure 2.6 shows a Telescoping Ceiling Fan Cleaner. This is an 18-inch duster with a wood handle. The long reach allows cleaning up the ceiling fan blades effectively and safely by avoiding the use of a chair or stool. The handle extends to 43 inches and designed with two seven-inch rollers that are full and fluffy. Just slide the rollers over the blades and the cleaner can clean both sides in one sweep. Instead of getting dust in

the eyes, it all stays on the roller. The advantage of this product is the rollers are washable. We do not have to change the rollers frequently.

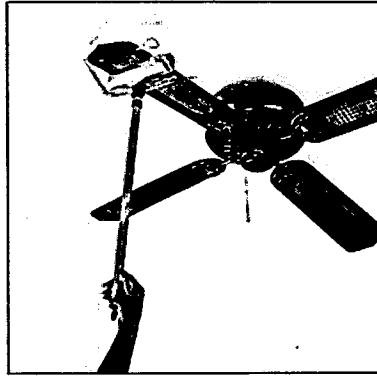


Figure 2.6: Telescoping Ceiling Fan Cleaner

2.3.3 Fuller Brush Reach Duster

The next product that existed in market is Fuller Brush Reach Duster. It is lightweight, highly maneuverable and extendable apparatus for cleaning ceiling fan blades, having a dust receptacle carried beneath a mounted brush which is designed to clean the exterior surfaces of a ceiling fan, the apparatus carried by a lightweight telescopic handle and capable of reaching high ceiling fans.

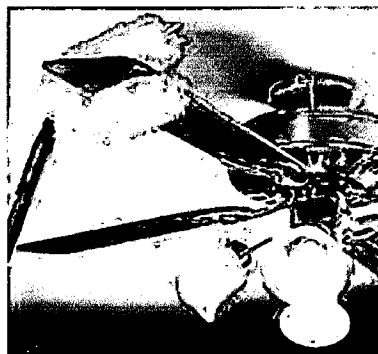


Figure 2.7: Fuller Brush Reach Duster

2.3.4 Pirrella Fan Sleeves

This is product that was design to clean up the ceiling fan from the dust. This product is called Pirella Fan Sleeves .Sleeves is made of a compound of nylon or elastin and one size fits most ceiling fan blades. These form fit sleeves have properties that collect air-borne dust, and once fitted, Pirrella Fan sleeves are transparent and do not detract from the look of the fan blades. Most ceiling fan blades are white metal and with the fan sleeve fitted to the ceiling fan blades, it is difficult to discern. However there are some weaknesses of this product. First the sleeves are easy to tear because it is made from nylon. It must hand with properly. Second, a sleeve can be used for single blade only. To protect all blades many sleeves are needed

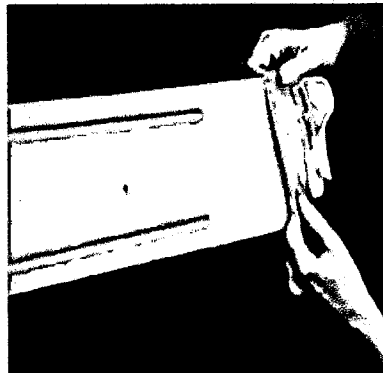


Figure 2.8 Pirrella Fan sleeves

2.3.5 High Place Vacuum Cleaner

The present invention is a simple attachment for a vacuum cleaner that allows the user to reach high places easier. The attachment is formed as a wand with an elongated bent handle and tool, which has a rotator connection to the handle. The invention may be utilized to clean ceiling fan housing and blades, high windows, light fixtures, high ceilings, air conditioner registers, outside windows, eaves of a home, elevated decks and more. Additionally, the High Place Vacuum Cleaner Attachment is adaptable and lockable to existing vacuum lines.

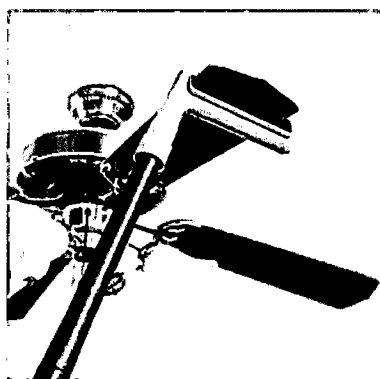


Figure 2.9: High Place Vacuum Cleaner

2.3.6 Clairion Comfort plus Air Cleaning Ceiling Fans

The Clairion fan rotates some of the air passes right through the fan blades where particles are trapped by an electrets filter while odors are adsorbed by the large surface area carbon filter. An electronic ion generator located at the center of the fan "pre-charges" dust particles making them easier to capture by the electrically charged fibers of the electrets filter and virtually doubling filtration efficiency.



Figure 2.10: Clairion Comfort plus Air Cleaning Ceiling Fans

2.4 Drilling Machines

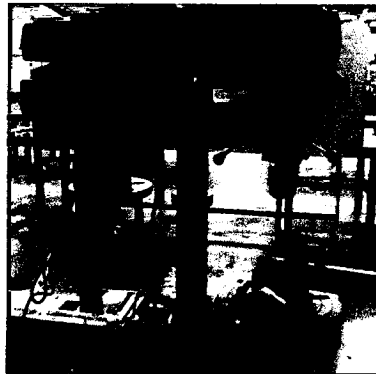


Figure 2.11: Drilling machine

Drilling machines are used for drilling holes, tapping, reaming, and small diameter boring operations. The most common machine is drill press, the major components of which are shown in Figure 2.11. The work piece is placed on an adjustable table, either by clamping it directly into the slots and holes on the table or by using a vise, which in turn is clamped to the table. The drill is lowered manually by a