CHAPTER 1

INTRODUCTION

1.1 Project Background

Ceiling fans are considered the most effective for most types of fans, as they effectively distribute air in the room to make drafts throughout the room. In Malaysia, ceiling fans will be installed even though some houses use an air conditioning as their cooling system. This is because Malaysia's location on the equator has caused Malaysia to experience hot and humid weather throughout the year. Ceiling type fans are extensively used in dwellings, offices and many other types of buildings to circulate air and thereby reduce the cost of heating during cold weather and air-conditioning during hot weather. Thermal comfort is the condition of mind that expresses satisfaction with the thermal environment and is assessed by subjective evaluation. Thermal comfort depends on many factors, in which, temperature, humidity, and air speed are among the most important ones. In cooling scenarios, although low temperature is the first choice for comfort control, moderate air speed as a breeze can enhance thermal comfort at higher temperature by “wind chill” effect [1]. In residential and commercial buildings, temperature control is achieved by using air conditioners, while air speed can be increased by using ceiling fans.

The proper use of a ceiling fan in an air-conditioned space can result in better thermal comfort and energy savings. Rohles et al. [2] studied the effectiveness of ceiling fans in enhancing comfort experimentally by examining 256 subjects under various temperature and air velocity in an environment chamber equipped with a ceiling fan. The results showed that an air plume from a ceiling fan with velocity between 0.5 and 1.0 m/s compensates for a 2.8 to 3.3 °C temperature change, this represents an energy saving of 15 to 18% Morton-Gibson et al. [2]. Thus, ceiling fan is the most suitable and affordable tool for all Malaysians. However, every equipment used will definitely have maintenance activities that consumers need to do regardless of whether in terms of cleaning or performance. For ceiling fan cleaning activities,

there are various ways consumers will do to make their ceiling fans look clean and function well.

The blades of such fans, particularly on the top surfaces, become encrusted with a layer of dust that clings to the blade surface and must be removed from time to time to maintain full effective operation of the ceiling fan. In a conventional method of cleaning ceiling fans, a person will stand on a ladder or stool so the blades can be reached and then cleaned with a cloth or brush. Because such cleaning operations are so difficult to perform, majorities of ceiling fan blades remain totally unclean or are not cleaned nearly as often as needed.

In another method used to clean ceiling fans, the extension wand and hose of a vacuum cleaner is used to remove dust from the blades. This method usually fails to do a satisfactory job because of blade movement and the inability of the wand to be positioned for correct cleaning. One of the ways to clean the ceiling fan is to use a moistened cloth to wipe off the dust stick on fan blades. This method is quite risky and not a choice because the user needs to use the ladder so that the ceiling fan blade can be cleaned properly. Another way that does not require a ladder are flat bendable duster with microfiber cloth or use a dust trap with a stick. The material used is like a brush, span or cloth. By using this method, the dust on the ceiling fan will fall to the floor or even the user's face. This time consuming method make people feel lazy to clean their ceiling fan especially people that have busy life with work. If ceiling fan blade cleaning activities at least once a month, too much dust will be stick on the ceiling fan blade. Nowadays, people think that the constantly turning blades would throw off any incidental dust that accumulates on a ceiling fan, particularly the blades of ceiling fans, but that is not the fact. The fact is, ceiling fans seem to be dust magnets.

To solve the problems faced by the consumers, a nozzle vacuum cleaner is proposed. Super nozzle cleaner is a nozzle that attach to the vacuum cleaner which is designed especially for ceiling fan blade. It provided an improved means for safely cleaning the surfaces of a ceiling fan blade which employs a vacuum. The vacuum assisted cleaning apparatus for cleaning the surfaces of the ceiling fan blade which provides a dust holder for capturing displaced dust that is not initially picked up by the vacuum.

1.2 Problem Statement

Vacuum performs as the cleaning tool to suck up solid, liquid waste materials especially dust quickly and efficiently. There are some types of vacuum that has variety of nozzle based on the part of place that needed to clean for example certain nozzle are specific to hard floor or carpet's surface. In process of cleaning of ceiling fans, the entire nozzle that has been produced by manufacturers did not meet the requirement. Meanwhile, the design of that nozzle is not suitable to clean up the ceiling fans since the position and the surface of the blades become the issues.

However, there are many ways to clean the ceiling fans such as using a wet cloth, sponges or brush but all this ways are not suitable for fast and efficient to clean all the blades. Nowadays, people had to struggle cleaning the upper part of the ceiling fan because they need to use a ladder to reach the upper part of the ceiling fans. Other cleaning tools require a large vacuum hoses or additions which minimize the cleaning are work especially when cleaning the ceiling fans. Besides, the cleaning process will only occur once in a while and this causes the health problem to the user as the dust will be trap at the blade of the fan. This is due to the time consuming and the complications in cleaning the blade.

Therefore, the manufacturer needs to identify and solve the issues to facilitate the process of cleaning ceiling fans especially in homes and shops to save energy and time in cleaning by design and produce a super nozzle that meet the requirements. The nozzle also must consider the material and safety for user. The super nozzle need to be more efficient so we can save the energy and environment because if the nozzle produced follow the correct materials and design hence energy consumption that is excess will be decrease through the lack of dust that stick to propeller blades.

1.3 Objective

1. To fabricate the new innovative super nozzle.
2. To reduce the risk in health and safety aspect.
3. To design an efficient and safe nozzle for cleaning the ceiling fan