

UNIVERSITI TEKNOLOGI MARA

**DESIGN AND FABRICATION OF
AN ELECTRIC BELT
SANDER**

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ABSTRACT

An electric belt sander is a mini power tool using motorized belt that sharpens and smooths the surface of the workpiece which allows people to finish their work faster without being physically tired. Moreover, it is obvious that the problem if we are using sandpaper, it requires a lot of time and energy to finish a sanding task for a product. The main objective is to build and test an electric belt sander that will assist users, particularly in workshop for final-year Mechanical Engineering students who enrolled in FYP to do finishing to their projects' surfaces. The direct current motor that is powered in this machine can speed up the sanding process is controlled by a speed controller which people can adjust the sanding belt speed depending on their workpiece type. The significance of this project is to design and build an electric belt sander with a lower cost that can save people's time and energy. Furthermore, it has a low maintenance cost because the only part that needs to be maintained regularly is the sanding belt once it is worn out. In a nutshell, this machine will give a lot of benefit for people who are interested in buying an affordable belt sander.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

A machine is something that was created by humans to simplify work. It is a device or invention that increases the impact of human labour. Nowadays, there are a lot of machines that come in any size and price which some products can be too expensive to buy [1]. That is why most people in workshop use a hand sander to do their finishing surface. No one can deny that it saves a lot of cost rather than buying a machined sander. On the other hand, a hand sander also has several disadvantages. Firstly, it will consume 100% of effort and energy for a person to smoothen their finishing surface which can be physically tired [2]. It also will affect long-term pain such as back pain or shoulder pain. Human energy is in a limited range and non-comparable to a motorized machine where people do not have to use all their energy. Other than time and energy consuming, usually there are bigger sanding belt machines that are too expensive and cost a fortune [3].

Thus, the concept of creating an electric belt sander emerged as the solution for this matter. An electric belt sander is a small power instrument that uses a motorized belt to finish the surface product quickly. It consists of a rotating bearing holder attached to a motor powered by a continuous loop sand belt [4]. This machine ultimately makes it a convenient tool for users in workshop to smoothen their finishing surface with less fatigue. In addition, this machine can be more cost-effective option for users who want one as its often less expensive than larger machine.