

UNIVERSITI TEKNOLOGI MARA

**DESIGN AND FABRICATION OF
MOTORIZED BENCH VISE**

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ABSTRACT

Vice is a tool that is commonly used in many manufacturing operations. To operate a vise, human effort is needed to open and tighten the vise jaws by rotating the handle in order to hold the workpiece securely. This caused a lot of effort required, as well as time consuming if there's a lot of workpiece to work on. Therefore, this fabrication of motorized bench vise gives a better experience for user than using a standard vise. Motorized bench vise is a motor operated bench vise that can clamp and hold workpiece securely by just pressing a switch. This project is designed to lower the effort and time required by using power screw mechanism. It comes with a power switch that can control the tightness of the jaws depending on the size of the workpiece. Hence, this project discusses the best invention to replace the standard bench vise for a better work experience.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

Nowadays, engineers are finding many ways to reduce human efforts which could ultimately save the labor cost and times. It is necessary to have a motorized bench vise which will be used as a replacement to a standard bench vise which is to hold an object safely and securely but fully automated. This project aims to eliminate all major human errors.

This project is designated to fabricate a motorized bench vise that functions better than any existing bench vise. Operating the lever of a standard bench vise is a conventional process that necessitate the use of human labor. The proposed project would help to reduce the time and have a better secureness. The tightness of the vise can be determined by the user as per requirement.

A whole new innovation will be added to the motorized bench vise. A motor will be attached to the screw of a scissor jack thru a universal joint. It comes with a power switch that can control the tightness of the scissor jack depending on the size of the workpiece. Therefore, user will experience a new and easier way to operate a bench vise.

1.2 Problem Statement

The standard bench vise can be found everywhere in the market and it is widely used by in the mechanical and woodworking industries. Bench vises make work such as sanding, finishing, sawing, and welding easier by securing the workpiece safely for the operator to perform the needed task.

Although the function of the machine makes work easier for users, they usually have problem when it comes to do work that requires different angle or position to operate. This problem happen because the standard bench vise can only function when it is stationed at one end of the workbench. Hence, the movements and positions of operating the workpiece that is held by the vise are limited. This will cause the time of the operation increases and requires a lot of human effort.