DESIGN IMPROVEMENT OF POWER TOOL FOR SAFELY AND QUICKLY CUTTING AND BEVELLING PIPES

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"I hereby declare this thesis is the result of my own research

except as cited in the references"

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A lot of thank I dedicated to my family, lectures and friends. Without your encouragement I will be here.

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Abstract

Over the last few decades much effort has been put into automation of different departments of the Investments Casting Industry, especially in wax and dipping. One area that is still in the "dark ages" in regards to automation is the cut off process. Cut off is an nightmare for companies due to the risk of injury that it presents for the employees. A lot of time and effort researching how to completely automate the process thus removing the human involvement. Removing the operator from the process completely however does present a new range of issues and this paper is designed to highlight these issues so that there can be better understanding of what is required to be able to facilitate automation. To this day, cut off in this industry involves either the operator holding the tree and presenting the tree to the abrasive wheel, or having the tree clamped and the operator controlling the motion of the tree remotely. The first is dangerous due to the close proximity of the operator to the abrasive wheel and the manual handling issues due to supporting the casting while cutting off. The second, whilst improving these issues, does not remove the operator from the process and consequently leaves it open to operator error. It is also very difficult to completely enclose the machine to protect the operator whilst giving them the visibility and functionality required to cut off successfully. Automation overcomes both of these issues as once the tree has been loaded into the machine the operator is then completely isolated. This allows for complete protection of the operator from coming in contact with the abrasive wheel and protects them from sparks and fragment of wheels that may shatter.

Abstrak.

Lebih sedekat lamanya pelbagai usaha telah dilakukan dalam bidang automasia dalam penyelidikan berkaitan mesin pemotong yang efektif dalam pelbagai lapangan yang berkaitan dengan minyak dan gas. Banyak masa diperuntukan dan usaha mengkaji bagaimana untuk mengalihkan terusa proses automasi menyingkirkan pengelibatan manusia.Menyingkirkan operator dari proses pemotongan akan menimbulkan satu isu yang baru dan kertas penyelidikan ini mengfokuskan permasalahan ini supaya kita lebih memahami apa yang diperlukan untuk memudahkan bidang automasi. Pada hari ini proses pemotongan melibatkan operator memegang besi atau papi yang hendak dipotong dan membawanya terus ke arah mata pemotong atau mengepit besi atau paip itu lalu pengendali mengawal pergerakan mata peotong semasa proses pemotongan. Cara kerja yang pertama adalah merbahaya disebabkan operator berkedudukan berhampiran dengan mata pemotong dan terdedah pada kecederaan disebabkan beberapa factor keselamatan yang tidak dapat dieelakan semasa mengendalikan jenteran pemotong. Cara yang kedua pula tidak menghindarkan operator dari pengendalian jentera dan mengakibatkan operator terdedah melakuakan kesilapan yang akan mengakibatkan besi atau paip mengalami kerosakan. Ia juga agak mustahil untuk melengkapi mesin yang dapat melindungi operator sewaktu memeberi jarak pengliatan dan berfungsi yang diperlukan untuk memotong dengan jayanya.Untuk kedua-dua permasalahan ini saya menyelesaikan dengan mencipta alatan yang mengunakan tenaga kerja operator yang minimaserta cepat dan menambahbaik mesin yang sedia ada agar mesin yang digunakan lebih mudah dikawal yang dapat mengurangkan kesilapan operator dan melindungnya dari serpihan-serpihan besi dan serta percikan api.

CONTENTS

CHAPTER TITLE PAGE

CHAPTER II LITERITURE REVIEW

LIST OF TABLE

LIST OF FIGURE

LIST OF GRAPH

LIST OF APPENDIX

CHAPTER I

INTRODUCTION

1.1 Background

This project is about to design and improve the power tool machine such as pipe cutting machine with an additional system for safety and quickly.

There are various types of powered machines for cutting and beveling machine functioned cutting large diameter pipes. Some machine that sold have rotary cutting tools which are that could affect the working action. Other use inclined torches similarly advanced both to cut and bevel metal pipes. Some rotary tool machine is powered by motor which supplied to electricity source. Other are powered by compressed air or by hydraulic fluids.

Various commercially cutting machine available may function satisfactorily for their intended needs, they all have certain limitations rendering them less than entirely satisfactory for cutting large diameter pipes.