UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF WIRE STRIPPING MACHINE FOR DOMESTIC WIRING

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor Degree of Electrical Engineering Technology (Industrial Power) with Honours.

by

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APPROVAL

This report is submitted to the Faculty of Mechanical and Manufacturing Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electrical Engineering Technology (Industrial Power) with Honours. The member of the supervisory is as follow:

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ABSTRAK

Tujuan utama mesin pelucutan dawai untuk pendawaian domestik adalah untuk mengelakkan pembakaran terbuka pada kabel elektrik terutamanya pada pendawaian domestik. Dengan melakukan secara manual, mengambil masa untuk alat lucut dan mesin pelucutan kabel boleh menjimatkan banyak masa dan melucutkan kabel elektrik tanpa dengan mudah. Terdapat banyak kabel tidak terpakai dalam penggunaan domestik. Kedai besi buruk yang tidak didaftarkan cenderung menghasilkan lebih toksik daripada pembakaran terbuka. Mereka menentang undang-undang alam sekitar untuk mendapatkan lebih banyak wang untuk poket mereka. Gangguan dari tindakan ini akan memberi kesan pada kawasan sekitarnya termasuk kanak-kanak dan dewasa. Pada masa yang sama, ia boleh mewujudkan penyakit melalui pencemaran udara.Pembangun projek ini, boleh mengekalkan kualiti tembaga.Jika membakar harga kabel akan turun dan berat akan berkurangan.Bilah bulat ini akan boleh memotong melalui penebat tanpa merosakkan tembaga kerana bahan tungsten karbida. Alasan utama menggunakan tungsten karbida adalah untuk menghalang bilah menjadi tumpul semasa mengekalkan dalam ketepatannya. Sistem operasi menggunakan motor elektrik skuter dalam arus terus. Motor ini mempunyai tork permulaan yang lebih tinggi dan arus permulaan yang lebih rendah. Motor ini menggunakan aplikasi Adruino untuk mengawal kelajuan motor dan arah pusingan motor. Mesin ini direka adalah untuk menjadi mesin mudah alih dan mesra pengguna. Hasilnya, ia menunjukkan bahawa dengan melaksanakan projek ini, ia dapat mengurangkan pencemaran udara dan mengekalkan kualiti tembaga. Selain itu, ia akan mengekalkan dari penebangan hutan dari syarikat perlombongan mencari tapak baru untuk mengeluarkan tembaga.

ABSTRACT

The main purpose of the development wire stripping machine for domestic wiring is for prevent open burning on electrical cable especially on domestic wiring .By doing manually it cost a time to stripper and wire stripper machine can save a lot of time and strip electrical cable effortlessly.There is a lot of scrap cable in domestic use.Scrap yard that non – registered tend to produce more toxic from open burning.They against the environmental law to earn more money to their pocket.Causes from this action will effect on surrounding area include children and adult.At the same time, it can create disease through air pollution.The development of this project , can maintain the quality of the copper.If burning the price of the cable will drop plus the weight will decrease.This circular blade will be able cut through the insulation without damaging the copper because the material is tungsten carbide.The main reason using tungsten carbide is to prevent the blade goes blunt while maintaining the sharpeness.The operating system is DC electric scooter motor .The motor has higher starting torque and lower starting current.The Adruino allow to control the speed of the motor and change its direction from forward to reverse.This machine is designing to be portable and friendly user.As the result, it shows that by implement this project, it can reduce air pollution and maintaining the quality of the copper.Plus it will preserve from deforestation from mining company finding new site to extract copper .

DEDICATION

I acknowledge my sincere dedication , honours and gratitude to both of my parents and my late dad for their love, encouragement,supports , and sacrifice throughout whole of my life.Without their sacrifices and encouragement , I cannot possibly reach this stage .Special gratitude also dedicated to all my brothers and sisters which always support and advise me in whatever I do in my life.Special thanks goes to all of lecturers who has taught and guided me throughout my studies.Not be forgotten , all of my friends who always been with me throughout this joyful journey.There is no word can express my sincere appreciation to all of you.

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PSM	-	Projek Sarjana Muda
PVC	-	Polyvinyl Chloride
AC	-	Alternating current
3D	-	Three Dimension space
EEE	-	Electrical and Electronic equipment
WEEE	-	Waste Electrical and Electronic Equipment
E-Waste	-	Electronic Waste
PAHs	-	Polycyclic aromatic hydrocarbon
As	-	Arsenic
LED	-	Light Emitting Diode
WHO	-	World Human Organization
Ba	-	Berium
Cd	-	Cadmium
Cr	-	Chromium
CRTs	-	Cathode Ray Tube
DNA	-	Deoxyribonucleic acid
Co	-	Cobalt

Cu	-	Copper
Pb	-	Lead
PCN	-	Polychlorinated napthalene
USEPA	-	United State Environment Protection Agency
PBDE	-	Polybrominated diphenyl ethers
PCDD	-	Polychlorinated dibenzodioxins
PCB	-	Polychlorinated biphenyl
PAHs	-	Polycyclic aromatic hydrocarbon
CD	-	Cadmium
Hg	-	Mercury
Zn	-	Zinc
Ag	-	Silver
Bi	-	Bismuth
In	-	Indium
Mn	-	Manganese
Mo	-	Molybdenum
Sn	-	Tin

TE	-	Tellurium
F	-	Flourine
Fe	-	Iron
Ni	-	Nickel
Al	-	Aluminium
Be	-	Beryllium
Ca	-	Calcium
Li	-	Lithium
Mg	-	Magnesium
Se	-	Selenium
Sb	-	Antimony
Sr	-	Strontium
PBDD/Fs	-	Polybrominated dibenzo-p-dioxins and dibenzo
PDD	-	Pervasive Developmental Disorders
F,PXDD/Fs	-	Mixed polybrominated/polychlorinated dibenzo-p-dioxins/furans
BPA	-	Bisphenol A
DEHP	-	Bis(2-ethyecyl)phthalate

MS	-	Malaysian Standard
BS	-	British Standard
Iec	-	International Electrotechnical Commission
JIS	-	Japanese Industrial Standards
SPST	-	Single Pole Single Throw

CHAPTER 1

INTRODUCTION

1.1 Introduction

Cable is an important component on wiring in the electronic and electrical of product applications today. The use of cables has increased significantly in line with the increasing use of electronics and other electrical products such as computers, the internet, cable television and increased power services worldwide. The cable has the function to connect an electrical current from one component with other electrical and electronics components. Furthermore, the cable could consist different of dimensions of size and material type. It is depends on the uses of the cable.Example, the underground cable which is deliver high voltage consists of armoured (steel wire gauze) to protect the cable.Meanwhile, for domestic use cable only has PVC(Polyvinyl chloride) that act as an insulator for the cable.

Generally, the cable consists of a core made of copper or fiber, insulators, and cable cover. The high use of cables in various electronic products has an impact on increasing electronics waste. Furthermore, at the wiring workshop there is a plenty scrap cable that cannot be use anymore. This cable is one of the recyclable electronics wastes and still has material that has economic value. In developing countries, the waste recycling process still uses very simple methods such as burned or manually shelled to obtain the metal in a cable. Thus, this action has the potential to have a negative impact on the human health and environment especially air pollution. For example, dioxins produced from the burning process of cables and could lead to a potential trigger for cancer . Therefore, in order to solve the problem, it is necessary to design an environmentally friendly waste cable stripper machine design and can meet the needs of the stakeholders of electrical waste management.

Designing of product concept is an activity of developing ideas into a concept of the design solution.The design is focusing on domestic wiring only because it is commonly widely used in home and wiring workshop.The size of the cable is 1.5mm² to 10mm² PVC(polyvinyl chloride).To move the machine is using electric scooter motor.The reason using electric scooter motor is because the motor has a higher starting torque and lower starting current.

In this project, SolidWork software was used to design the model of wire stripper machine.Sketch Up for 3D model electrical cable design.

1.2 Project Background

Figure 1.1: Domestic wiring installation

This project is about to recycle cable from the scrap cable that has been used to prevent open burning method.The stripper machine will separate the copper from its insulator without harm to environment .By doing this , it will reduce the air pollution