AUTOMATED EGG INCUBATOR (AEI)

NUR HIDAYAH BINTI MOHD AMIR

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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NUR HIDAYAH BINTI MOHD AMIR

This Report Is Submitted In Partial Fulfillment Of Requirements For The Bachelor Degree of Electronic Engineering (Industrial Electronics) with honours

Fakulti Kejuruteraan Elektronik dan Kejuruteraan Komputer
Universiti Teknikal Malaysia Melaka

JUNE 2013

UNIVERSTI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : AUTOMATED EGG INCUBATOR (AEI)

Sesi Pengajian : 2012 / 2013

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TAMAN PERWIRA
42500 TELOK P. GARANG
SELANGOR

Tarikh: 14 JUNE 2013

(COP DAN TANDATANGAN PENYELIA)

DAVID YAP POOK WENG
Pensyarah
Fakulti Kejuruteraan Elektronik Dan Kejuruteraan Komputer
Universiti Teknikal Malaysia Melaka (UTeM)
Karung Berkunci No 1752
Pejabat Pos Durian Tunggal
76109 Durian Tunggal, Melaka

Tarikh: 14 JUNE 2013

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Nama Penyelia : Dr David Yap Fook Weng

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DEDICATION

This project report, the accompanying presentation and all the effort is solely dedicated to my beloved Parents

ACKNOWLEDGEMENT

With the name of Allah S.W.T the most merciful, Alhamdulillah, with His bless I could done the responsible that have been given to me to do this "ProjekSarjanaMuda" and its report as well as I can.

Firstly, with full of grateful, I would like to give a million of appreciation and thanks to my supervisor, Dr. David Yap FookWeng for his kind guidance, criticism and advice throughout my project session. He has provided a good balance freedom and interest and has been a constant source of ideas and suggestions and recommendations. Thank you very much.

Here also, I would like to acknowledge in particular continuous support of my parents and family. They have been consistent encouragement for me throughout my three years of university education. Not forget, thanks to all my friends who always give me support on my way finishing my project. Thanks everyone.

Lastly, I would like to give a million of thanks for all who been directly or not in order to help me along my project. Thank you very much.

ABSTRACT

The purpose of this project is to design and develop an egg incubator system that is able to incubate eggs from chicken, ducks and goose. This system is called Automated Egg Incubator (AEI). This project is eco-friendly, which use as much as possible recyclable material thrown away. AEI will control the temperature and humidity. AEI also has sensor that can monitor the incubator conditions. For the heating element in this project, we will use the light bulb to provide a suitable temperature to the egg. Thermostat will be used to control the temperature inside the incubator. Water will be used to maintain the humidity inside AEI. Air pump will be used to make sure the air circulate inside AEI, this will make the humidity inside the incubator evenly spread. If the eggs are hatched, the buzzer that is installed with incubator circuit will sound to indicate that there is movement of chicks or ducklings. The movement can be detecting by using ultrasonic sensor. Solenoid is used in order to turn the eggs. The purpose of moving the egg is to prevent the yolk inside the egg from attach to the egg shell/skin. There is one element that will be controlled using programmable integrated circuit (PIC), which is the display the status condition of AEI on the LCD screen display. This project will be a user-friendly product because it is produced in a small size and can be moved to other places with minimal user handling.

ABSTRAK

Tujuan projek ini adalah untuk menghasilkan ‘egg incubator’ yang boleh menetaskan telur ayam, itikdan angsa.Sistem ini digelar ‘Automated Egg Incubator’ (AEI).Projek ini merupakan mesra alam iaitu menggunakan sebanyak mungkin bahan-bahan terbuang sepert ikayu. AEI akan mengawal suhu dan kelembapan. AEI juga mempunyai sesnsor yang boleh memantau keadaan AEI. Untuk elemen pemanasan, mentol digunaka nuntuk member suhu yang sesuai kepad atelur. Thermostat digunakan untuk mengawal suhu di dalam AEI. Pam udara digunakan untuk memastikan udara beredar dengan sekata di dalam AEI. Pergerakan telur boleh dikesan menggunakan ‘ultrasonic sensor’. Solenoid digunakan untuk memutarkan telur.Tujuannya adalah untuk memastikan telur tidakrosak. PIC digunakan untuk mengesan dan memaparkan status AEI pada skrin LCD. Projek ini mesra pengguna kerana dihasilkan pada saiz kecil dan senang digunakan.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDIXES

CHAPTER 1

INTRODUCTION

1.1 Background

Industrial raising of farm animals indoors under conditions of extremely restricted mobility is commonly known as factory farming. It is done as part of industrial agriculture which is a set of methods that change as laws and technology change known as industrial agriculture which is designed to produce the highest output at the lowest cost, using economies of scale, modern machinery, modern medicine, and global trade for financing, purchases and sales.[1]

Egg incubator is one of the inventions that provide opportunity especially for those who want to be an excellent farmer. This invention is low cost and an eco-friendly, which use as much as possible recyclable material thrown away. The construction of this project is used almost 99% of hardwood as the main material. The purpose of this project is to design and develop an egg incubator system that is

able to incubate eggs from chicken and ducks. This is because these two livestock are often in high demand in this country. The systems will automatically controlling the temperature and humidity of the incubator. The function of egg incubator is to take over the animal job to incubate an egg until hatched.

1.2 Objectives

There are several objectives involved in this project that we need to achieve in order to design the project.

a) To design a low cost and an eco-friendly egg incubator, which use as much as possible recyclable material thrown away.

b) To provide a user friendly egg incubator (automated) with its small and mobile footprint.

1.3 Problem Statement

There are a lot of commercial egg incubators out there in the market been designed to hatch eggs. However, they are high in cost and not environmentally friendly. Alternatively, the Automatic Egg Incubator (AEI) is designed to overcome this problem. Besides, AEI also to improve the available eggs incubator in order to change the traditional farming method to advance and modern farming method. By introducing the Automated Egg Incubator may help our country achieve a food trade balance surplus.

1.4 Scope of Project

The scope of this project is categorized into three parts such as software, hardware and mechanical design.

The software which will be used for this project is MicroC Pro software and Proteus 7.2. Proteus 7.2 software is used to design the circuit to be produced on PCB board. MicroC Pro software is used to install the program code regarding the process in the system of the project.

There is several hardware components and circuit used in this project. Thermostat is used to control the temperature inside AEI. The outputs for thermostat are light bulb for the heating element and air pump. Water level sensor is used to detect water level inside the AEI. The output for water level sensor is water pump. Then, ultrasonic sensor is used to detect any movement inside the AEI. The output for this sensor is buzzer.

The mechanical design is based on the system size. It is consists the development of incubator casing and partition inside the incubator. Recycling stuff such as hardwood will be used for the project design.

1.5 Importance of Project

With a bit of research we determined it would be the best course of action for several reasons:

a) The incubator will help farmer produce product in a short time with large amount of eggs.

b) An egg incubator can be considered a replacement for incubate session of animal

c) The incubator will be large enough to avoid problems of less production.

1.6 Thesis Organization

This thesis is combination of 5 chapters that contain the Introduction, Literature Review, Methodology, Result and Discussion and the last chapter is a Conclusion and Recommendation of the project.

Chapter 1 is an introduction of the project. In this chapter, introduction is discussed about background of the project, problem statement and the purpose of developing this project. It also mentions the important of this project. It introduces the project flow from the beginning to the end of the project daftly. The concept of the project and overall overview of the project also will be discussed in this chapter.

Chapter 2 focuses on Literature Review consist about the background study and research before developing this project. It contains the content of the background studies of the Automatic Egg Incubator (AEI).

Chapter 3 will explain about the project methodologies of the project. In this chapter project activity such as workflow, procedure, block diagram and method that are, we following in order to develop this project.

Chapter 4 discusses on the result and discussion of this project. During do the project, many problems have accorded. By doing some inspection and troubleshooting, the solution has been found and all devices may function properly. The methods and result analysis proved with the design of flowcharts and function of this system.

Chapter 5 discusses the conclusion and recommendation of the project. After the project is done, recommendations are made for the betterment of this project or any expansions or upgrades that might be done in the future.

CHAPTER 2

LITERATURE REVIEW

This chapter contains the literature review on theoretical concepts applied in this project. It contains the information gathering of the project in order to complete the whole project.

2.1 Incubation basics

Incubation is the term used to describe the process of applying heat to an egg so that the embryo contained within develops into a chick [2]. Aviculturists of today have three options regarding the incubation of eggs and the procedure accordingly differs somewhat in each case. Each option has some advantages and some disadvantages as compared to the other two.