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FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER
ENGINEERING**

AN AUTOMATED HOOD HAIR DRYER

BY

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BU/UG/2012/74

JUNE 2016

Declaration

This project report is my original work and has not been presented for a degree in any other University or any other award.

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Sign:

Date:

Approval

The undersigned certify that they have read and hereby recommend for acceptance of Busitema University a project report entitled “*An Automated Hood Hair Dryer*”.

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Sign:

Date:

Dedication

This project report is dedicated to my mother, Mrs. Nambuya Jennifer for the tireless efforts she has put into the success of this project.

Acknowledgement

First and foremost, I extend my sincere and inexplicable gratitude to the Almighty God who has enabled me to contrive through all the challenges up to this time.

I would also like to acknowledge and appreciate my supervisor; Mr Odongtoo Godfrey for his whole-heartedly support and guidance especially toward the accomplishment of my project and research. To all my lecturers am very grateful for the unwavering support rendered to me during this time.

To my classmates and friends who sacrificed their time and knowledge and engaged in discussions as regards to the successful development of my project work; I also extend my thanks to my Parents who have always financed me in different endeavors as regards my Education is concerned.

Abstract

The hood hair dryers currently used in Uganda use the mechanism of estimation and setting the time the hair of the customer will take to dry. They can't help the hair dresser tell when the hair is dry. In most cases the hair is either not yet dry or it's too much dried. This has led to overheating of the customer's hair and scalp which causes brittleness, breakage, dullness, and dryness of hair to the point where it is stripped of its natural moisture, causing the customer's cuticles to dry and snap off. This also causes power and time wastage, for the hair dresser and the customer respectively.

This project was therefore aimed at developing a system that provides an automated way of drying hair using a hood hair dryer basing on the hairs' moisture content. It increases independence in drying hair as it enables automatic and accurate hair drying without intervention of the hair dresser. It also reduces power consumption and time wastage.

This work is arranged mainly in six chapters, chapter one includes the background information on drying human hair, the problem statement considered in the study, justification, objectives and scope of the project. Chapter two discusses the literature related to the system which includes human hair and temperature in a hood hair dryer, Chapter three illustrates the methodologies used in coming up with the working prototype of the system that is to say: observation, literature review, and consultation, Chapter four includes system design and analysis, Chapter five contains the implementation and testing of the system and finally chapter six which contains the summary of the work, , discussions and recommendations.

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List of Abbreviations and Acronyms

- ADC** - Analog Digital Converter
- DHT**- Humidity and Temperature Sensor
- LCD**- Liquid Crystal Display
- ISP** – In System Programmer
- No**- Number
- RF**- Radio Frequency
- Uc**- Micro controller

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Healthy and attractive looking hair is one of the most desirable features a woman or any person that keeps long hair can have. Healthy hair growth starts with a healthy scalp because that's where the 'roots' of the hair follicle are located [1]. To achieve this, many individuals wash their hair clean and dry it either under the sun or using a blow dryer or a bonnet hair dryer or a hood hair dryer. Using the hood hair dryer has been the most efficient way of drying hair because it is one of the best ways to achieve straight or curly hair without direct heat and also speeds up hair drying [2]. It is flexible in such a way that a person doesn't have to sit so upright. Because of this, most hair dressers and salons in Uganda have adopted the use of hood hair dryers for drying hair. The requirements for drying hair using a hood hair dryer are based on estimation and setting the accurate time needed for complete drying of hair. That is to say, to dry hair using a hood hair dryer, the hair dresser has to estimate and set the time the customer will spend under the hood hair dryer. Usually at this time, the hair dresser confirms if the hair has fully dried by feeling it with his or her hands. Incases when it's not yet dry, the person is made to sit under the hair dryer again.

Because of different kinds of hair, estimating the time one will take under a hood hair dryer becomes difficult. Thick or long hair can take longer time to dry than short or thin and spaced hair [2] . Because human beings can't be so accurate in estimating the time needed for complete hair dying, most people sit under the hair dryer longer than needed and sometimes lesser. And because human can't have the same kind of scalp, some people's scalps are very weak and can't handle high temperatures. Due to the above, some people are heated beyond what is required which is dangerous to a human scalp. Some people resort to putting the head out for a while, as it cools, and then put it back in the hood hair dryer.

25 percent of hair loss is due to scalp issues. It most times results from frequent color or heat treatment that often leads to breakage. Any irritation or inflammation of the scalp

can interfere with optimal hair formation and weaken the integrity of the hair [1]. And over-applying heat to human hair when it is already dried causes brittleness, breakage, dullness, and dryness to the point where hair is stripped of its natural moisture, causing cuticles to dry and snap off [1] .

In addition to the above, most of the times it's the customer who calls or informs the hair dressers that the hood hair dryer has gone off which is the duty of the hair dressers to know that the hood hair dryer is off. This is also inconveniencing in cases when the hair dresser has moved out or to the next room in the salon.

Therefore, this project provides a better environment inside the hood hair dryer that is conducive for most hair types and weak scalps.

1.2 PROBLEM STATEMENT

The hood hair dryers currently used in Uganda use the mechanism of estimation and setting the time the hair of the customer will take to dry. They can't help the hair dresser tell when the hair is dry. In most cases the hair is either not yet dry or it's too much dried. This has led to overheating of the customer's hair and scalp which causes brittleness, breakage, dullness, and dryness of hair to the point where it is stripped of its natural moisture, causing the customer's cuticles to dry and snap off. This also causes power and time wastage, for the hair dresser and the customer respectively, hence the need for an accurate manner of drying hair in order to prevent overheating.

1.3 OBJECTIVES

1.3.1 Main objective

To design and implement an automated hood hair dryer that automatically turns off the hair dryer and notifies the hair dresser.

1.3.2 Specific objectives

- i. To investigate the related literature on human hair and hair dryers.
- ii. To analyze and identify the requirements needed to design an automated hood hair dryer.

- iii. To design the hood hair dryer module and the hair dresser module that will be used to come up with the overall system.
- iv. To implement the designed modules.
- v. To test and validate the automated hood hair dryer.

1.4 JUSTIFICATION

The hood hair dryers currently used in Uganda use the mechanism of estimation and setting the time the hair of the customer will take to dry. They can't help the hair dresser tell when the hair is dry. In most cases the hair is either not yet dry or it's too much dried. This causes overheating of the customer's hair and scalp which has its negative effects on the customer. It also causes time and power wastage, for the customer and the hair dresser respectively.

Therefore, this renders a great opportunity for this developed system in order to relieve the hair dressers from the hard task of accurate time estimation.

1.5 SIGNIFICANCE

- i. This project increases independence in drying hair as it enables automatic and accurate hair drying without intervention of the hair dresser.
- ii. It also reduces power consumption and time wastage.

1.6 SCOPE

This project focuses on the design of an automated hood hair dryer that will basically monitor the moisture content of the hair to automatically turn off the hair dryer.

It's also limited to programming a microcontroller that runs the devices which control the conditions within a hood hair dryer.

It was undertaken from the month of November to the month of April, a period of six months.

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