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FACULTY OF ENGINEERING



FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

PROJECT REPORT

ABOUT

DESIGN AND CONSTRUCTION OF APOTABLE METALLIC BOX SOLAR COOKER

BY

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BU/UP/2022/1194

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A final year project report submitted to the faculty of Engineering of Busitema University in partial fulfillment of the requirements for the award of a diploma in electrical and electronics engineering.

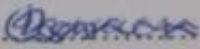
DECLARATION

DECLARATION

I Okuku Barack honestly declare that the work described in this project report is, except for citation and quotations, entirely my own work and has not been submitted as an exercise for a diploma at this or any other institute of higher learning.

Okuku Barack

BU/UP/2022/1194

Signature... 

APPROVAL

APPROVAL

This is to approve that this project report is submitted by Okuku Barack to the department of electrical engineering, Busitema University, in partial fulfillment of the requirements for the award of the Diploma in electrical and electronic engineering under my supervision:

Ms. Mugume Patience

Signature.....

Date.....



ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my guide and mentor Mrs. Mugume Patience for her support and guidance in completing my project. I'm also grateful to the university staff for their consistent support and assistance. Finally, last but not least, I appreciate all the support by all my friends and family who constantly supported me and kept my hopes high even in the difficult times that we could go through. I'm also thankful to my classmates for their valuable suggestions which helped me in many phases of the completion of this project. I'm doing this project not just because of marks but also for knowledge and skill set. This project has proven to be a good explanation on how Solar Energy can be a best alternative to other energies in the near future. It has given me some very valuable information and in-depth knowledge of solar energy. So, I'm very thankful that my mentor has chosen me for this project. Above all the Almighty God, you are the master of everything, may you continue blessing me in all my way.

ABSTRACT

In Uganda, due to the high price of cooking gases and electricity, people still cook with noncommercial fuels like charcoal and firewood. These cause a lot of health problems and also harm the environment. A clean solution to this problem is to use a solar cooker. As solar cooker uses solar energy for its operation and provides an effective solution for the energy crisis, which is a major problem. Besides being safe it is also environmentally sustainable as there is no carbon emission. Firewood and charcoal have been the main backbone of cooking energy in Uganda. However, firewood is got from cutting down trees which has led to rapid rate of deforestation and desertification. This project describes the performance evaluation of a box-type solar cooker with reflector fabricated using locally available materials, size of the box is 635 mm $\times$ 635 mm. The experimental solar cooker consists of an aluminum absorber plate (1 mm) painted matt black and a double-glazed lid. The bottom and sides are lagged with wool insulator, thickness = 100 mm. The reflector consists of a metallic-framed cover for the box when not in use.

Thermal performance experiments were conducted in order to determine the output energy

(E_{out}) of the box type solar cooker by calculating the temperature difference. Finally, the results illustrated that the cooker has a good reliability for cooking food and boiling water.

Table of content

APPROVAL	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	
v CHAPTER ONE	
.....	1
1.1 INTRODUCTION	1
Background	2
Working principle of a metallic box solar cooker	2
1.3.1 Description:	3
An oven thermometer	4
A Water Pasteurization Indicator (WAPI)	5
It is a simple thermometer that indicates when water has reached pasteurization temperature and is safe to drink. It consists of a small polycarbonate tube that contains a soybean wax that melt when water or milk is heated enough to be pasteurized (65°C/149°F).	5
Diagram of WAPI	6
Problem statement	7
To conserve the environment by using solar cooker as a means of cooking energy, currently the existing solar cookers are constructed using wood and other cooking cookers are using wood as fuel sources which has led to cutting down of trees. To conserve the environment, I have designed a metallic box solar cooker.	
7 Main Objectives:	7
Justification	7
PURPOSE OF THE PROJECT	8
Many solar cookers presently in use are relatively inexpensive, low-tech devices, although some are as powerful or as expensive as traditional stoves and advanced, large-scale solar cookers can cook and	

pasteurize drink for hundreds of people. Some of the salient features are as follows:	8
1.6.1 Importance of Solar Cookers for Purifying Water.....	8
Many parts of the world in which fuel is scarce have high temperatures and humidity, which are ideal conditions for micro-organisms and pathogens that pollute the waterways. Even water drawn from wells quickly becomes contaminated in such conditions, and diseases such as typhoid and cholera pose serious health hazards. The Solar Cookers International Network noted that pasteurizing water in a solar cooker before consumption by raising the temperature to 151 degrees Fahrenheit (66 degrees Celsius) is an effective way to purify it (as opposed to heating to 212 F/100 C as you would in a kettle on a stove), and every type of solar oven can achieve sufficient temperatures for this under the right conditions.	
1.6.2 Sterilizing Medical Equipment with the Sun	8
9	
1.6.3 Solar Cookers Keep the Air Clean.....	9
9	
SCOPE OF THE PROJECT	9
9	
1.7.1 Roasting Coffee and Peanut for commercial purposes:	10
1.7.2 Grain Sterilization:.....	10
1.7.3 Ironing:	10
2.1 LITERATURE REVIEW	11
11	
METHODOLOGY	11
11	
2.2.1 Construction of box type solar cooker.	12
3.3 CALCULATION OF ENERGY OUTPUT	13
13	
4. EXPERIMENTAL DETAILS	13
13	
4.1 Time interval	14
14	
2.4.2 Angle of reflector	16
16	
2.5 LIST OF COMPONENTS NEEDED	17
17	
2.6 PROPOSED BUDGET	17
17	
PROPOSED WORKPLAN	18
18	

2.7 EXPECTED RESULTS OF A METALLIC BOX SOLAR COOKER	18
2.7 advantages of a metallic box cooker	19
2.8 Disadvantages of a solar cooker	20
References:	20
Appendix	21
.....	21

LIST OF TABLES

Table 1: proposed budget.....	18
Table 2: proposed workplan.....	19

LIST OF FIGURES	
Figure 1 Dimensions of a box solar cooker	Error! Bookmark not defined.
Figure 2: oven thermometer.....	5
Figure 3: WAPI	6
Figure 4: box solar cooker	12