

Solar Dryer

Prof. V.M.Heralge,
Mr. Kunal R. Manole¹, Mr. Krishna M. Kore², Mr. Arbaj N. Balekhan³, Mr. Manish D. Kamble⁴
, Mr. Aadarsh A. Kamble⁵

¹ Diploma, Electrical Engineering, DKTE's YCP Ichalkaranji, Maharashtra, India

² Diploma, Electrical Engineering, DKTE's YCP Ichalkaranji, Maharashtra, India

³ Diploma, Electrical Engineering, DKTE's YCP Ichalkaranji, Maharashtra, India

⁴ Diploma, Electrical Engineering, DKTE's YCP Ichalkaranji, Maharashtra, India

⁵ Diploma, Electrical Engineering, DKTE's YCP Ichalkaranji, Maharashtra, India

ABSTRACT

The development of nations depends on energy consumption, which is generally based on fossil fuels. This dependency produces irreversible and dramatic effects on the environment, e.g. large greenhouse gas emissions, which in turn cause global warming and climate changes, responsible for the rise of the sea level, floods, and other extreme weather events. For millions of years, mankind has been storing food materials after drying and salting process of drying usually involves sun as the source. For years this process of drying is also evolving and is being innovated at every level. This process of drying in the sun now includes Solar Dryer as its major equipment and requirement. The process includes harvesting and drying, two energy consuming steps, which are, therefore, expensive and unsustainable. The goal of this project was to develop a solar dryer for the food. The prototype includes a control system to ensure that the food is not destroyed during the drying process.

Keyword:- Solar dryer, Quality product, Arduino Uno, Automation, Multi-stacking

1. INTRODUCTION:

The development of nations depends on energy consumption, which is generally based on fossil fuels. This dependency produces irreversible and dramatic effects on the environment, e.g. large greenhouse gas emissions, which in turn cause global warming and climate changes, responsible for the rise of the sea level, floods, and other extreme weather events.

For millions of years, mankind has been storing food materials after drying and salting process of drying usually involves sun as the source. For years this process of drying is also evolving and is being innovated at every level.

This process of drying in the sun now includes Solar Dryer as its major equipment and requirement. The process includes harvesting and drying, two energy consuming steps, which are, therefore, expensive and unsustainable.

The goal of this project was to develop a solar dryer for the food. The prototype includes a control system to ensure that the food is not destroyed during the drying process.

2. METHODOLOGY:

- The chamber design needs the temperature controlled throughout the drying process.
- Under drying cases fungal inspection & bacterial action, thus main objective is design the solar dryer tunnel & design circuit to control various drying parameters inside it.

3. FUNCTIONAL BLOCK DIAGRAM:

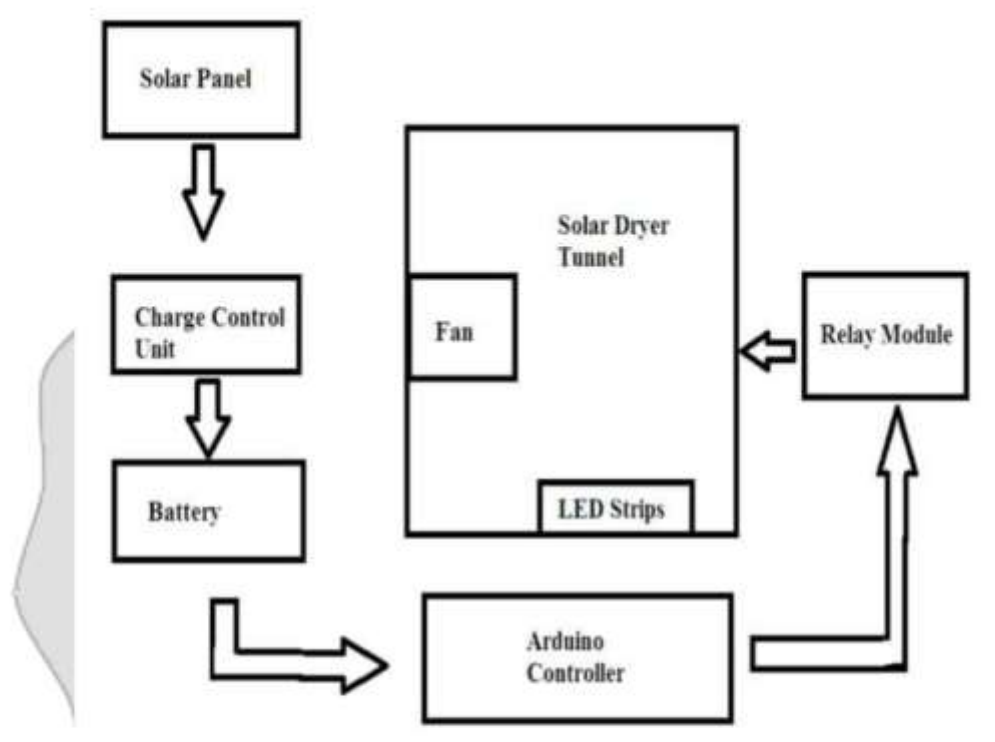


Fig -2: Functional Block Diagram

3.1 HARDWARE RESULTS:

The system is basically works on the principle of time management. The natural air is inserted in the system the fan can push air in heat chamber. The heat chamber consists of high voltage LED strips maintaining the air temperature for drying of agricultural products. Instead of time wastage we can perform the system with the help of ARDUINO configuration and coding.

From the usage of servo motor the system management of door of heat chamber open & close. With the basis of metallic tray the maintaining of products and getting simplicity. With the help of 12V LITHIUM ION battery for system supply. With the help of solar panel of 10Watt . The solar panel is electrically connected to battery. The charge controller is used to prevent the battery from the overcharging & over discharging. Variable sensors like IR sensor, humidity sensor (DHT 11) & LDR.

3.2 ADVANTAGES:

- To boost effectiveness.
- To speed up a worker's or farmer's drying process.
- To keep the stuff fresh for a long time.

4. CONCLUSIONS:

Solar drying is an affordable, cost-effective alternate way to fix the shortcomings of conventional open sun drying in low-income countries. Using solar drying for agricultural and marine products has tremendous technological and energy-saving potentials. It is essential to measure and promote the short-term and long-term cost benefits of solar dryers to owners.

5. ACKNOWLEDGEMENT:

We hereby would like to express our heartiest gratitude to our Head of the Department Prof. V. M. Heralge who is also our project mentor for giving us an opportunity to make this project. We would like to thank her for her constant assistance and encouragement throughout our project.

6. REFERENCES:

- [1]. Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, 4(11):8731-8740.
- [2]. Dangi, N., 2017. Review on Monitoring environmental parameters: humidity and temperature using Arduino based microcontroller and sensors.
- [3]. Hedge, V. N., Horus, V. S., Rathod, S. K., Harsoor, P. A. And Badari, N., 2015. Review on Design, fabrication and performance evaluation of solar dryer for banana. Energy, Sustainability and Society Journal.
- [4]. Moloney, C., 2016. India's major agricultural produce losses. [Online]. Available: <https://www.firstpost.com/business/indias-majoragricultural-produce-losses-estimated-at-rs-92000-cr2949002.html> [Accessed on 30-July-2018]