

MULTI-CROP SUSTAINABLE BASHER

Mrs. Sri Sangeetha R^[1], Mr. Kishore T^[2], Ms. Jeya Prashanthini R^[3], Ms. Nivitha R^[4], Mr. Manoharan M^[5]

^[1] Assistant Professor

^[2 to 5] UG Students

Department of Electrical and Electronics Engineering, Sri Eshwar College of Engineering, Coimbatore – 641202.

E-mail: sangeetha.r@sece.ac.in, kishore.t2016eee@gmail.com, jeyaprashanthinir@gmail.com, nivitharajendran@gmail.com, manoharanm110698@gmail.com

ABSTRACT:

In agriculture, the process of separating edible part from the chaff is the most important process and it is called as threshing. Traditional methods involves threshing by humans and animals but that causes low output leading to high cost of operation and time consumption is huge. And also traditional method involves separate measurement of weight. To solve this “Multi-crop sustainable basher machine” with quantity control brings in automation in agricultural field.

KEYWORDS—Automatic threshing and storing, Weight measurement.

I. INTRODUCTION

The world has completely been automated. The automation in agricultural field is a huge development and it is quite useful for farmers. As the traditional process of detaching seeds from the chaff consumes more time and man power, an alternative way to do the process is using a threshing machine.

This “Multi-crop sustainable basher” is used to separate the edible part automatically when crops are sent inside using a micro-controller. It is also used to measure the weight and that includes a load cell.

II. PROBLEM STATEMENT

The field of agriculture doesn't involve much development in the field of automation. So on beating the crops to separate the edible part from chaff causes losses and it is bad for the subsequent process. Traditional threshing involves more man power and the

Weight of crops sent inside and the separated edible part after threshing is weighed separately consuming more time. This problem can be overcome by using thresher machine with load cell for measuring the weight automatically.

III. SURVEY

Small survey was done in the fields in and around our city. When we went on examining those fields, we found individual people beating the crops to detach the edible part and some other separate machine to measure the weight of the seeds each and every time after threshing. This analysis made us to come out with designing a single machine for doing the both the task of detaching the seeds and measuring the weight in a continuous process.

IV. METHODOLOGY

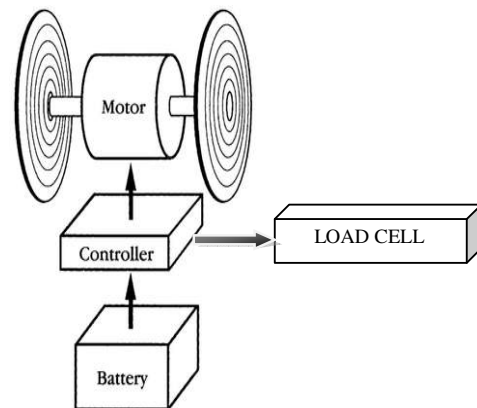


Fig 1: Block Diagram

The block diagram shows the overall working of the system. The required program for controller is created through software and are fed to the devices using cables. Then the micro-controller and the machine are connected, with this the process is made continuous. They are being interfaced with load cell to measure the output after separating the edible part from the chaff and the required production analysis can be done to take the next required action.

V. HARDWARE MODULES

In our project, multi crop sustainable basher, we have developed a mechanical setup for continuous process. The following are the hardware components used,

1. Power supply module
2. Threshing module
3. Weight scale module

1) **POWER SUPPLY MODULE:**

In this module, we are using solar energy to power up the machine. By using solar cells light energy is converted into electrical energy and energy of about 230V is taken and given to the inverter where it is converted from direct current voltage source into alternating current voltage source which is then fed into a battery[1].

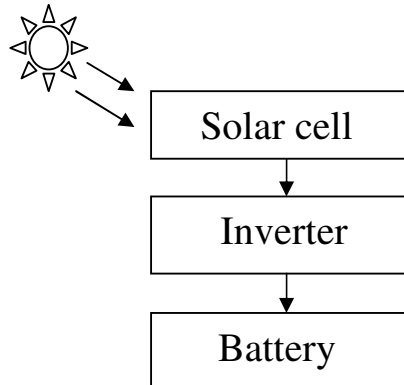


Fig 2: Block Diagram

This block diagram shows the overall working of power supply module.



Fig 3: Solar cell

Solar cell is used to obtain electricity from sun light by photovoltaic effect which is the chemical and physical phenomenon.

In addition of energy it can be used as a photo detector, detecting light or measuring light intensity. The specification of the solar cell used in our project is 20w[1].



Fig 4: Inverter

Inverter is a electronic device, it converts DC to AC.

This devices does not generate power, because it is generated using DC source[1].



Fig 5: Battery

A battery is a self-reliant, chemical power that produces a limited amount of electrical energy anywhere.

Battery gradually converts chemically packed inside it into an electrical energy. We are using a battery of 12V 7A.

2) **THRESHING MODULE:**

In this module, the crops are sent through the inlet and the threshing process is taken place by which the edible part from the chaff is separated and collected.

The grain-shovel part of the threshing module is powered and rotated by the DC motor to cut the grain from the chaff and the DC motor is supplied by the battery.

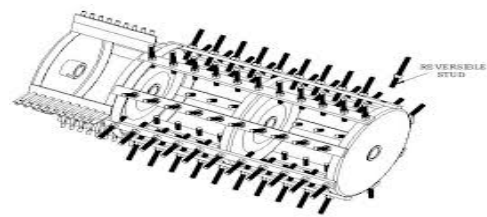


Fig 6:Thresher

In the first stage, the crop is inserted in to the feeder. By using the DC motor, it starts rotating and the crops get separated from the chaff.



Fig 7: DC motor

DC motor is an electrical machine which converts electrical energy to mechanical energy.

It is based on the principle of current carrying conductor placed in a magnetic field. A DC motor of 12V is used in our project which rotates the shaft to separate the grain from the chaff[1][2][4][5].

3) **WEIGHT SCALE MODULE:**

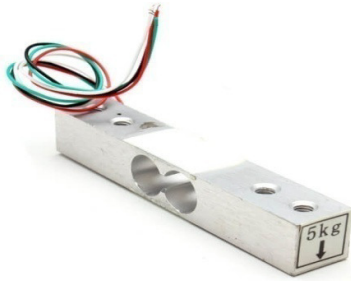


Fig 8: Load Cell

Load cell is a sensor or a transducer which converts load or force acting on it into an electronic signal.

In our project, load cell automatically plays its role in measuring the kilogram of crop which is being separated and it can measure up to 1-5kg.

VI. WORKING PRINCIPLE

The solar cell observes the solar energy from sun and it is converted into electrical energy. The electrical energy is stored in battery for further purposes.

Battery is charged using a electrical energy converted by a solar to drive DC motor.

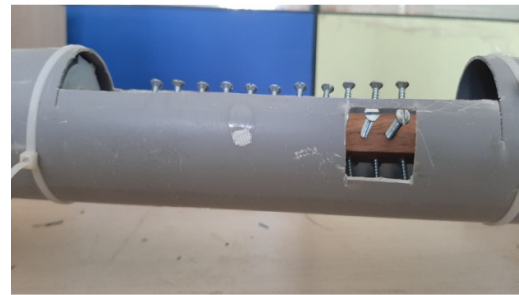
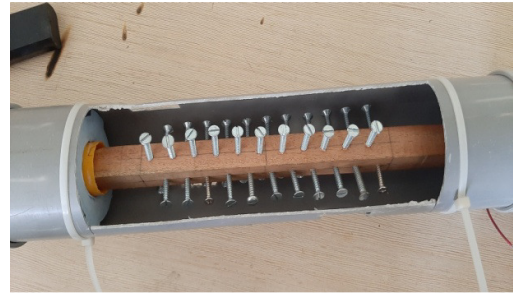
The DC motor starts rotating which makes threshing drum to rotate.

When DC motor rotates threshing drum attached to the shaft also starts to rotate and crops are get separated from chaff.

After separating, it gets collected in a container to measure the weight of the separated crops using load cell[1][2][4][5].

VII. DESIGN AND IMPLEMENTATION

The mechanical setup along with the function of the process are shown in the below figures,





VIII.CONCLUSION

The following results have been achieved through this work,

The design and fabrication of the threshing machine is successfully carried out. By using this machine, crops are separated, collected, and weighed easily. Automation technology has helped to reduce the man power and time consumption.

IX. Reference

- 1) Akshay R. Nandeshwar¹, Hitesh K. Bhajipale², Chetan P. Tambe³, Humedra B. Kumbhalwar⁴, Swapnil J. Patil⁵
^{1,2,3,4,5} Wainganga College of Engineering & Management, Nagpur, India
- 2) Chabrol, D.; Chimwala, M.; Cuffe, O.; Favre, B.; Hanyona, S.; Heijmans, E.; Marzin, C.; Osborn, P.; Design Fabrication of Solar Operated Thresher Machine (IJSRD/Vol. 6/Issue 01/2018/413) All rights reserved by www.ijred.com
1520 Sultan, J.; and Tissot, C. 1996. The Technical Centre for Agricultural and Rural Cooperation. ACP-EU Lome. 6: 12-15.
- 3) Volume 8, Issue 11, November 2017, pp. 1020–1028, Article ID: IJMET_08_11_104
Available online at <http://www.iaeme.com/IJMET/issues.asp?JType=IJMET&VType=8&IType=11>
ISSN Print: 0976-6340 and ISSN Online: 0976-6359
- 4) INACHIKET BARIYA,²DHRUVIT PATEL,³HARDIK PATEL,⁴RAJAN PATEL,⁵HEMANT PATEL¹ 2 3 4 4th
year mechanical students, lit sarigam 5M.E. (Thermal Engineering) Assistant Professor at LIT, Sarigam
- 5) Design and Fabrication of Agriculture Separator Machine Ravi S M Assistant Professor Department of Mechanical Engineering Srinivas Institute of Technology Mangaluru, Karnataka – India