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Design and Fabrication of Multipurpose Semi-Automatic Bag Filling Machine for Agricultural Cereals in Mills

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Abstract: ***In mills and agricultural fields grains are collected by means of number of labors and more time consumption. In order to limit the time and work wages a simple mechanical heaping machine is been constructed to handle with less labors. The main objective of this project is to heap the paddy and also to clean the garden in an effective manner with simple adjustments and less remuneration. In this machine the driving shaft of the wheel is welded with sprockets on either side of the shaft. Grain collecting machines it is operated fully in a mechanical means. In modern grain handling machines, the grains are collected by means of vacuum suction and it requires external power supply.***

I. INTRODUCTION

We all know that Agriculture is the back bone of India. In this modern world however the technologies are improved and new modes of business types has emerged Agriculture has its own forms of development through evolution of new machineries and new varieties of crop yield is been employed. Industrial Revolution and the development of more complicated machines, farming methods took a great leap forward Instead of harvesting by hand with a sharp blade, wheeled machines cut a continuous swath. Instead of threshing the grain by beating it with objects such as rods, threshing machines separated the seeds from the heads and stalks.By following this process, the grains are being collected and dried by means of large number of labors. In order to cut short, the labor usages and to reduce time consumptions, manually operated heaping machine is employed in order to reduce the labor usage and reduce time consumption. Separating the grains from the soil and collecting them from the ground and in the groove of the land by hand and by holders is a hard work and time consuming to that is not precisely done. Hence the need for a machine to collect the grains in the field has been identified. The development of a growing population increases the need of food day by day. There are several solutions to increase the production of cereals.This study aims to determine the exact losses grains that are wasted on the ground and loss in the operation of harvesting and design and evaluate a collector capable of collecting the grains shattered in the field due to harvesting.This project aims to design and fabrication of collecting and storing of grains by manually. Main objective behind designing and fabricating the bagging and collecting of grains is to reduce the human effort and also reduce time taken for storing. This project mainly helpful to the former the problems faced by small scale farmers relating with availability of labors and cost of collecting and storing finally It is also capable of reducing time wastage, reduction in breakage of the grains. Problems faced by small scale farmers relating with availability of labors and cost of collecting. Automation can be achieved through computers, hydraulics, pneumatics, robotics, etc., of these sources; electronics form an attractive medium for low cost automation. Automation plays an important role in automobile. Nowadays almost all the automobile vehicle is being atomized in order to product the human being. The automobile vehicle is being atomized for the following reasons.

II. OBJECTIVE

In agricultural field, the by-product from the plants such as wheat, paddy, groundnut, etc are dried for removing the moisture in it. The collection of cereals done by workers by using their hands .In order to overcome the problems faced by the agricultural workers, we made a small solution in the form of a machine. This machine will make the work easier

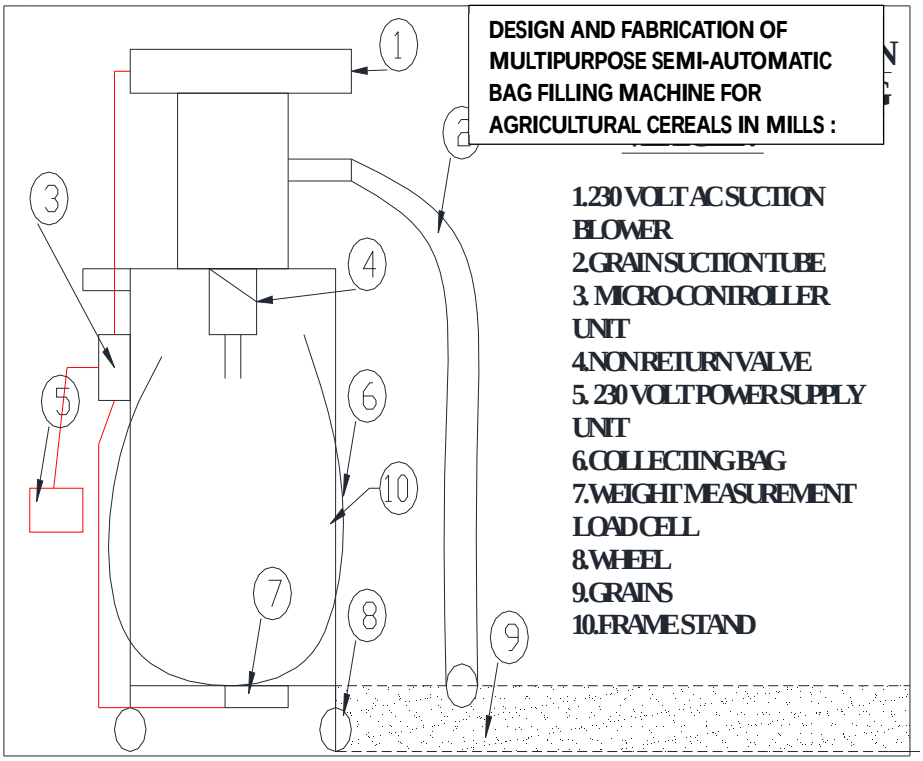
III. WORKING PRINCIPLE

Load cell is fixed to the bottom of the grain collecting vehicle as shown in diagram. The strain gauge sensor is used to detect the load of the vehicle. The microcontroller unit is receiving the supply from the load cell. The display unit is interfaced to the microcontroller unit.

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The vehicle load is displayed in the LED or LCD display.A vacuum based grain collector which collects the grains from concrete area or ground by suction process. The important components are Frame, V-plate, vacuum cleaner, load cell and wheel. Machine is electrically operated. As the machine is moved, grains are collected by V-plate. Due to vacuum, hose sucks the collected grains and is filled in the dustpan. When the machine is switched off, valve fixed below the dustpan gets (NRV) opened and grains directly fall into the collecting bag. Load cell fixed below the load bag will determine the weight and displayed automatically in the LED display.

IV. BLOCK DIAGRAM



V. LITRATURE REVIEW

1.Novateur Publications International Journal Of Innovations In Engineering Research And Technology [IJIERT] ISSN: 2394-3696 Website: ijiert.org Mayuri B. Thete,Madhuri S. DaleTejaswi B. TheteVaccum Grain Collector Bagging And Weighing Machine7, July. -2021 To fabricate a machine which can collect, bag and weigh the food grain simultaneously at a time.

2.International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET) | e-ISSN: 2319-8753, p-ISSN: 2320-6710| www.ijirset.com | Impact Factor: 7.512 Thachery Dhaxith , Vignesh PS , Vineeth R Shetty, Vishal S, K.V.Suresh , Hemanth Suvarna Grain Collector Technology 6, June- 2021 All of the different types of grain collectors designed and fabricate have been able to collect grains in an effective way, which could be viewed as the goal of reducing human effort and saving time has been achieved.

3.International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Santosh M B Sunilkumara H Design and Fabrication of Grain Collector 2019 Conference Proceedings A manual grain bagging machine that collects grains from the concrete pavement floor through the collecting bin and made to fall into the bag placed adjacent to it. This machine has vast application in India due to lack of electricity and investment for the poor formers. This machine reduces the grain collecting time and labour cost.

4.Turkish Journal of Computer and Mathematics Education K.SATHISH, P.MAHESH BABU, B.SURESH RAM, K.NAGA TEJA, K.PRUDVI RAJ Vol.13 No.01 (2022) It has considerable potential to greatly increase the efficiency of collecting seeds with comparison of other traditional available techniques. Machine can be operated manually when at rest position of the hopper the machine is moved the grains which is presented on the floor is to be collected in the hopper up to 4 to 5 kgs of grains

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VI. COMPONENT AND DISCRIPTION

A. Non Return Valve(NRV)

The Non-return valves are used to ensure the right direction of the flows of the medium through a pipe, as pressure conditions may otherwise cause reversed flow.



1 ½ inch cast iron (NRV)

B. Vacuum Blower

Wet and dry vacuum cleaner is known for cleaning both wet spills and dry dust from various surfaces



Capacity :20L

C. Wheel

The wheels made of the popular Non-marking nylon type absorbs shock and vibrations .Ideal as replacement castors for office chairs,Sofa,cabinets ,coffee table ,plant stands, tables ,house hold furniture ,washing machine stands ect



Material :Nylon Wheel includes 4 piece swivel and 4 fix caster wheel Rotate 360°

D. Load Cell

A load cell usually is in the form of a properly shaped and sized piece of material, often a form of metal, to which the force is applied. The distortions to this material caused by the force may be measured by attached strain gauges, piezoelectric elements, or other methods.

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Capacity :200kg

E. Suction Tube

The main purpoud of a vacuum cleaner house is to make cleaning certain areas easier



Material –PVC

F. Stand (Frame)

Mild steel has high strength and resistance for breakage. It has good mechanical properties which is useful for many engineering applications.



Size – 25x 25(mm x mm)Thickness -3.0mm

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G. Jumper Wire

Jumper wires are electrical wires with connector pins at each end. They are used to connect two points in a circuit without soldering



Feamle to female Material : Plastic

H. Step Down Transformer

Step down transformer are used to decrease the voltage incoming to the site by increasing the electrical current It dose this by converting the incoming voltage in the primary winding to necessary lower voltage in the secondary winding.



Input voltage -230volt Output voltage-15volt

VII. RESULTS



VIII. CONCLUSION

This project work has provided us an excellent opportunity and experience, to use our limited knowledge. We gained a lot of practical knowledge regarding, planning, purchasing, assembling and machining while doing this project work. We feel that the project work is a good solution to bridge the gates between institution and industries.

We are proud that we have completed the work with the limited time successfully. The "DESIGN AND FABRICATION OF MULTIPURPOSE SEMI-AUTOMATIC BAG FILLING MACHINE FOR AGRICULTURAL CEREALS IN MILLS " is working with satisfactory conditions. We are able to understand the difficulties in maintaining the tolerances and also quality. We have done to our ability and skill making maximum use of available facilities.In conclusion remarks of our project work, let us add a few more lines about our impression project work.

Thus we have developed a "DESIGN AND FABRICATION OF MULTIPURPOSE SEMI-AUTOMATIC BAG FILLING MACHINE FOR AGRICULTURAL CEREALS IN MILLS " which helps to know how to achieve low cost automation. The operating procedure of this system is very simple, so any person can operate. By using more techniques, they can be modified and developed according to the applications.

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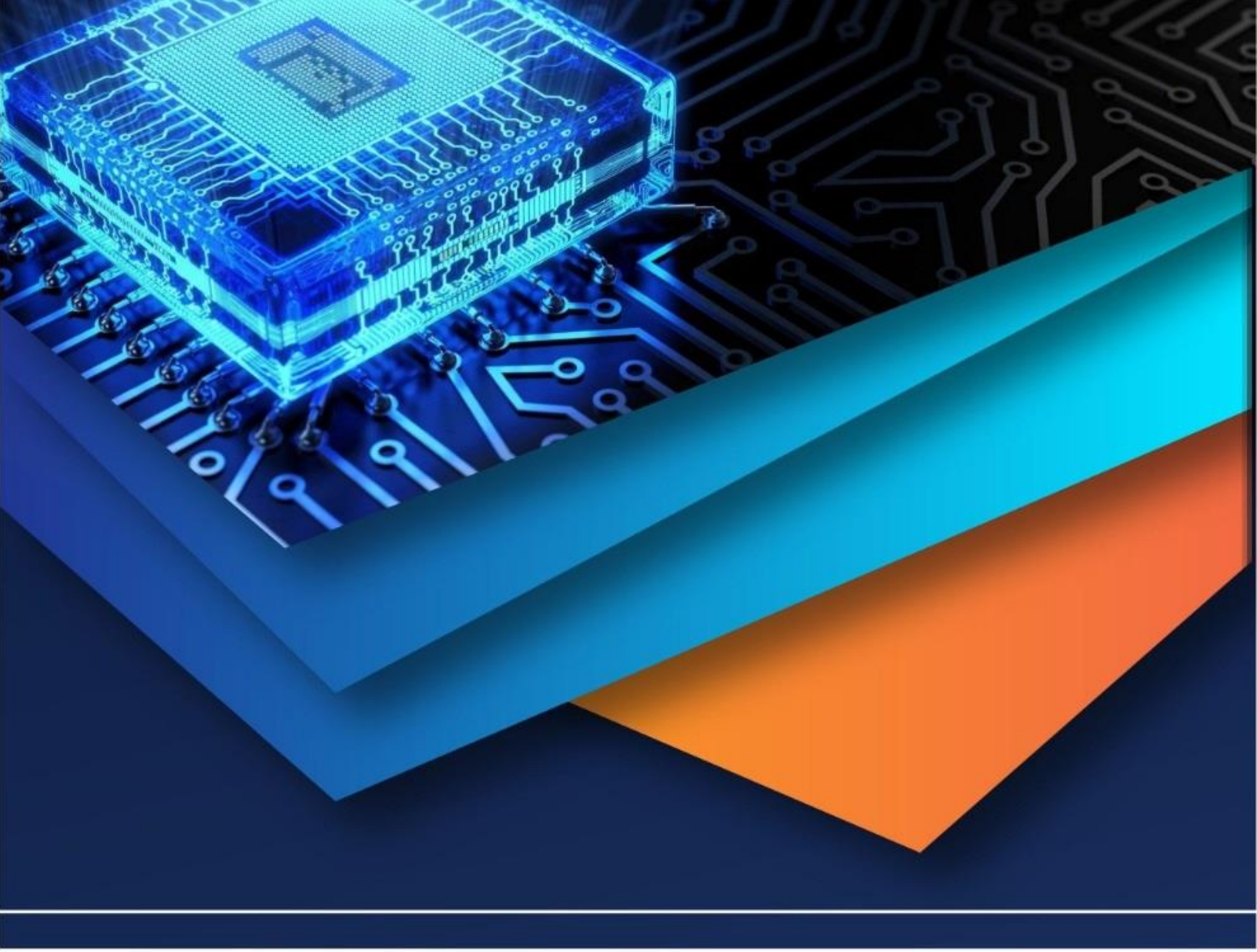
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