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Fabrication of Grain Refining Machine

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ABSTRACT

Food grains are the primary need of living beings. To obtain grain in the purest form i.e. (Without any impurities). The food grains which comes after threshing contains lot of impurities such as ferrous materials, straw, dust and dirt. We are designed a machine which can segregate these impurities from the grains with the help of magnetic roller and blower. The hopper is especially design to control the flow rate of grains. The variable type motor is used to rotate the magnetic roller or conveyor belt and also increase and decrease the mass flow rate of grains. In addition to motor a separate blower is used to remove the light density particles such as straw, dust etc. As it is relevant from the research facility that the grains impurities are more ferrous in nature which is easily attracted by magnetic field.

Keywords : Food Grains, Magnetic Roller, Motor, Blower, Impurities Segregate.

I. INTRODUCTION

The process of segregation of magnetically attracted particle from the non-magnetic particle is achieved by creating a magnetic field and passing the mixture over magnetic roller. As the grain coming out from hopper to conveyor belt through the adjustable feeder, which can control the flow rate. The conveyor system and magnetic roller is run by variable type electric motor which can control the velocity gain by grain or discharge rate. The magnetic nature particle will get attracted by magnetic roller and this particle will get demagnetized as it pass away from magnetic roller. The velocity gain by non-magnetic particle help it to flow away from magnetic roller. This is the process of separation of ferrous and non-ferrous material from their mixture, but in addition to this there is a special arrangement provided to segregate the light density impurities with the help of blower. The flow rate is so adjusted to provide the best outcomes. The flow rate is so adjusted to provide the best outcomes. The

blower is run by the arrangement of reduction gear box in the motor or separate power connection is incorporated.

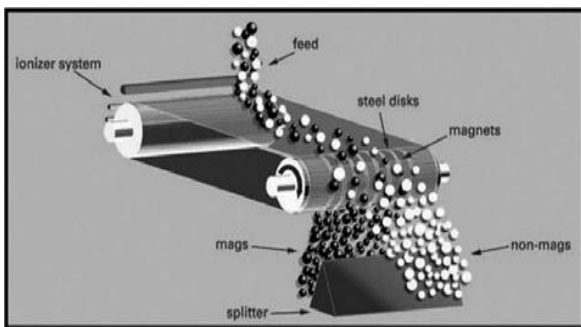
II. OBJECTIVE

To design and fabricate the machine which is capable of segregating the impurities in grain and is also suitable for the consumer to buy this product in a very reasonable cost and also for domestic as well as industrial purpose. The machine is a magnetic bed specially designed to separate under constraints operational and environment conditions. An innovative addition to the setup will be a blower to take care of any residues with light density along the bed. The speed of the blower will be potentially controlled accordingly. The already machine available in market for this purpose has too much cost and can be able to segregate only magnetic impurities but our project machine has the capability of

segregating both magnetic and light density impurities with minimum cost.

III. PRINCIPLE OF OPERATION

The principle of segregation of magnetic and non-magnetic particle from their mixture by creating field and mass flow rate of air. This is achieved by gravity feed hopper which has adjustable discharge area, through the conveyor belt and magnetic roller which is driven by electric motor of variable speed controller to adjust the discharge flow. Also the blower take care of light density particles to provide the grains in purest form



IV. APPLICATION

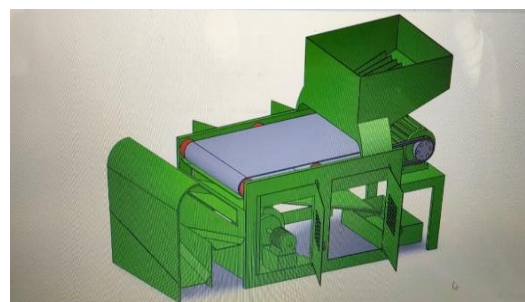
As grains are staple food for the human being and can be used in a daily basis. There is huge demand to obtain this product in the purest form and with minimum cost and time. To satisfy this need our machine will play a vital role for various domestic as well as industrial potential buyer. The product has enough demand in farming industries and the major wheat, rice, cereals, and mustard producing area are Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Tamil Nadu, Maharashtra, etc.

V. FABRICATION PROCESS

The various processes involved in fabrication of this machine are:

- 1) Cutting of sheets and pipes
- 2) Drilling
- 3) Welding
- 4) Grinding
- 5) Fastening
- 6) Coating
- 7) Assembly

According to the design of hopper, the G.I. sheet are to be cut and welded to form the hopper. The base of the machine is to be made from cast iron as it is hard and capable of handling vibration and load. The rigid structure is to be welded and motor, blower, are to be fastened to get easy removal if needed. The conveyor belt, roller are to be aligned properly with the motor for proper flow of material. The blower is mounted below and slightly backward to magnetic roller for proper and efficient working. Effective partition is to be done between purified grains, light density impurities and ferrous material, for segregation and handling of grains and impurities.



The various components used in fabrication are

- 1) Hopper
- 2) Motor
- 3) Magnet

- 4) Conveyor belt
- 5) Bearing
- 6) Roller
- 7) Blower

VI. RESULT

The fabrication of grain refining machine has been done which enables the segregation of impurities from the grains in the most efficient and well organized manner. The machine is capable for using in domestic as well as industrial based by varying its size. The speed of motor and discharge rate from hopper is controlled as per need. All the process of fabrication has been done efficiently to get the best result.

VII. CONCLUSION

Grain refining machine play a vital role in present as well as in future, to meet the ever increasing demand of obtaining the grains in purified form. Also this machine is asset for domestic as well as farming industry.

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