International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 03 Issue: 04 | Apr-2016 www.irjet.net p-ISSN: 2395-0072

DESIGN AND FABRICATION OF GRAVITY SEPARATOR FOR SOYABIN SCREENING

Ankush P. Borkar[1], Aniket S. Shrawankar[2], Ashwin P.Nandanwar[3] ,Gaurav P. Meshram[4]

Suhas V. Kale[5]

[1234]Student(VIII sem), Dept.of mechanical engineering, Priyadarshini Bhagwati College of Engineering Maharashtra india

[5]Professor, Dept.of mechanical engineering, Priyadarshini Bhagwati College of Engineering Maharashtra india

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Abstract- Agriculture plays a vital role in the Indian economy. Indian agriculture is at crossroads and one of the major challenges is to reverse deceleration in agricultural growth. The grains on handling after harvest contain various proportions of material other than grains (MOG) such as stone, pod, stem and dirt. Separation of the MOG is essential to upgrade the quality of food material.

The development of a grain separation machine presents a review of former needs/approaches. The Available evidence suggests that the grain separation machine in the rural areas by the traditional use of hand beating/ separation of the grains. This method reduces for time wasting, energy sapping and more labor.

The objective of this work is to decrease the time required for dust separation thus it will be supportive for agriculture field.

This paper describes an overview of grain separator machine with its different components, principle of operation and applications.

I. INTRODUCTION

Agriculture is the backbone of Indian Economy. Agriculture is basically an energy conversion industry. A is available. India has a major agribusiness sector, which farm is an energy consumer and a producer, because with the use of the different energy inputs, energy output as a crop production has achieved remarkable successes over the last three and a half decades. Unprocessed foods are susceptible to spoilage by biochemical processes, microbial attack and infestation. The right post harvest practices such as food processing techniques play a significant role in reducing spoilage and extending shelf life.

VARIOUS COMPONENT OF SYSTEM

1)**supporting plates** : A frame is a structural system that supports other components of a physical construction and designed to bear a load in a lightweight economical manner

2)**Crank mechanism**:.

3)**Filtering tray**: Tray is the rectangular or square shaped one sided open chamber, used for collecting and storing the materials.

4) **Motor** :An electric motor is a motor that uses electrical energy to produce mechanical energy, usually through the interaction of magnetic fields and current-carrying conductors. The reverse process, producing electrical energy from mechanical energy, is accomplished by a generator or dynamo. Traction motors used on vehicles often perform both tasks. Electric motors can be run as generators and vice versa, although this is not always practical. Electric motors are ubiquitous, being found in applications as diverse as industrial fans, blowers and pumps, machine tools, household appliances, power tools, and disk drives. In our prototype model we utilized 12 volt dc motor having 300rpm

5) **Cable** : cable is two or more wires running side by side and bonded, twisted or braided together to form a single assembly. In mechanics cables, otherwise known as wire ropes, are used for lifting, hauling and towing or conveying force through tension. In electrical engineering cables used to carry electric currents. An optical cable contains one or more optical fibers in a protective jacket that supports the fibers

CONSTRUCTIONAL FEATURES

Material

Material are the dominated factor in culture advancing civilization anthropologist and historian have identified the significant material by giving the name such as stone edge , bronze edge or iron edge .after this material make the crucial role for industrial revaluation and they have major role in modern high technology.

The engineering material substance rather used to produce technical product .they include ceramic, metals, polymers, semi conductor, rubber and composites selection of proper material is one of the important stages in the process of machine design .the best material is one which will have served the desired purpose at minimum cost.

Availability

the material should be such that it is easily available in the market in a larger quantity and at minimum cost.

Cost

The cost of material should be less so that it will reduce the total cost of the product.

Mechanical properties

Mechanical properties of material are the most important technical factors. It is used for making the machine component. They include strength under static and fluctuating load. Elasticity, plasticity, stiffness, resilience, toughness, ductility, manufacturing consideration, etc

Selection of different parts

By considering the above factor for selection, the following parts are selected. they are—

Fine filter tray

Angles for the framework

Mechanical Link

Motor

cable

The model which we have fabricated one model

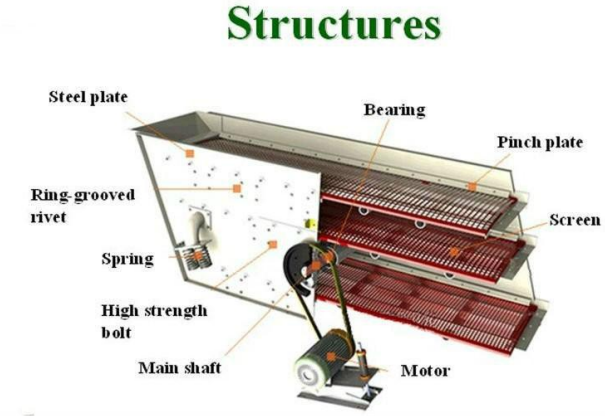
The parts in the fabricated model are:-

Crank mechanism -- 1 Nos

Filtering tray -- 3 Nos

Motor -- 1 Nos

SCREENING PROCESS



A screening machine consist of a drive that induces vibration, a screen media that causes particle separation, and a deck which holds the screen media and the drive and is the mode of transport for the vibration.

There are physical factors that makes screening practical. For example, vibration, g force, bed density, and material shape all facilitate the rate or cut. Electrostatic forces can also hinder screening efficiency in way of water attraction causing sticking or plugging, or very dry material generate a charge that causes it to attract to the screen itself.

As with any industrial process there is a group of terms that identify and define what screening is. Terms like blinding, contamination, frequency, amplitude, and others describe the basic characteristics of screening, and those characteristics in turn shape the overall method of dry or wet screening.

In addition, the way a deck is vibrated differentiates screens. Different types of motion have their advantages and disadvantages. In addition media types also have their different properties that lead to advantages and disadvantages.

Finally, there are issues and problems associated with screening. Screen tearing, contamination, blinding, and dampening all affect screening efficiency.

APPLICATIONS

- IN FOOD INDUSTRIES
- IN AGRICULTURE
- IN OIL INDUSTRIES
- IN DOMASTIC PURPOSE

ADVANTAGES

1)getting more out put

2)required less time

3)required less manpower

4)more reliable

5)required less electric consumption

6)unit is portable

7)technology is simple

CONCLUSION

Conclusion of the project work is that it helps the students to their imagination, engineering skills and fundamental knowledge.

The project includes the studies the basic knowledge of manufacturing, design, metrology and quality control and production engineering. This project helps the students to improve their theoretical as well as practical knowledge.

This semi automatic machine is developed to reduce the time and effort required for production up to the great extent .also this machine manufacturing cost is less as compared to other

It is not tough so the machine can be manufactured in a college workshop and the model is in working condition

The project also teaches the way of working as a unity proper co ordination is to be established with student in the project group. It enhance the thinking or filling of mutual co operation in the project

Also the projects learn to fabricate any model according to its requirements. All the manufacturing processes are carried out with a great

SCOPE OF PROJECT

In today modern life, every industry want to improve production by reducing time required and the total cost for it. For this purpose, generally, automation is done in every activity in every industry.

The sand filtering machine want to placed in place where continuous production will getting through conveyor machine will placed in between conveyor for improvement in semi automatic to fully automatic system

ADVANTAGES

1)Work is easy.

2)Time saving and Maintenance is less.

3)Portable unit

4)Transportable over long distances

5)Technology can be easily learned

6)High speed operation

COST ANALYSIS

Cost analysis is the process of forecasting the expenses to produce a product in related area of manufacturing. Cost analysis is necessary to know the capability of the product with other existing in the market.

SR NO	PARTICULAR	QTY	COST (Rs)
	Supporting main frame	1NOS	2200/-
	Hanging frame	1 NOS	1600/-
	Crank mechanisms	1NOS	2000/-
	Filtering tray	3NOS	2000/-
	Bottom guide roller	4 NOS	600/-
	Motor 1 PH , 230VOLT ,2800 RPM	1NOS	4550/-
	Cable	10 FT	500/-
	Fabrication	-------	3500/-
	Miscellaneous	------	2000/-
	TOTAL		16,950/-

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