

DESIGN AND FABRICATION OF SAND SAPERATOR

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Abstract: Construction of buildings requires sand as an important ingredient Sand is used at different stages in construction right from the foundation to the finishing work i.e. plaster. This sand is needs to be screened properly for various stages in construction, i.e. size of sand for construction work is slightly coarse whereas that used for plaster work is fine. Conventionally screening is normally done manually using fixed screens or machines. This manual process time consuming and laborious takes a lot of time and cost. It is also observed that the conventional machine prove of no or little help as the sand needs to be manually transported and material handling takes place twice to get different sizes of sand.

These processes are carried out manually. Sieving of sand is carried out using rectangular mesh which is inclined at certain angle. This causes a relative motion between the particles and the sieve. Depending on their size the individual particles either pass through the sieve mesh or retained on the sieve surface. There are different machines that are being used for sand sieving processes. In our project the process will takes place automatically. Thus the time consumed during the whole process of preparing the concrete is reduced.

INTRODUCTION:

Generally while preparing the concrete for construction purpose, the process of sieving are carried out manually. Sieving of sand is carried out using rectangular mesh which is inclined at certain angle. In the present sand sieving method, the sample is subjected to horizontal movement in accordance with the chosen method. This causes a relative motion between the particles and the sieve. Depending on their size the individual particles either pass through the sieve mesh or retained on the sieve surface. There are different machines that are being used for sand Sieving, but we demonstrate the design & fabrication of automatically driven sand sieving machine which have low cost and simple in operation.

This project focuses in design, fabrication of the mechanical part of machine and the system of the sieve machine. To achieve this project objective, this sieve machine body structure and mechanical system needs to concern some other criteria such as strength, safety and ergonomic design. This project flow must start from design, analysis, and lastly fabrication process before develop the sieve machine, it must compare with other product in market. It is because to study the customer need and to create a new design with new feature.

LITERATURE REVIEW:

From years sand has been the most important thing in human community. Most sediments, including sand, are made up of the fragments that result when rock is broken down by wind and rain (weathering). Generally, they start as larger fragments (gravel), which are broken down as rivers carry them down stream; the finer the particle, the further it has traveled. In other words, large bits of gravel are plentiful on the banks close to the head of a river. As you travel downstream, gravel becomes finer into cobble, pebble, granule, and eventually turning into sand, and finally flowing into the ocean, where these sediments deposit.

Most sediments, once formed in the ocean, subduct to the Earth's interior (mantle) from trench with a subducting tectonic plate. However, some pieces tear loose from the whole, and accreted to the hanging wall continental plate, once again becoming part a continent. Geological structures formed in this way are called accretionary bodies (prisms). Accretionary bodies are characteristic to the subduction zone like Japan, which make up a large part of the Japanese islands.

As the sand is basic element of every construction work and usually available in mixture (gravel), many ideas have been developing to separate the sand from mixture.

PROJECT PROBLEM STATEMENT:

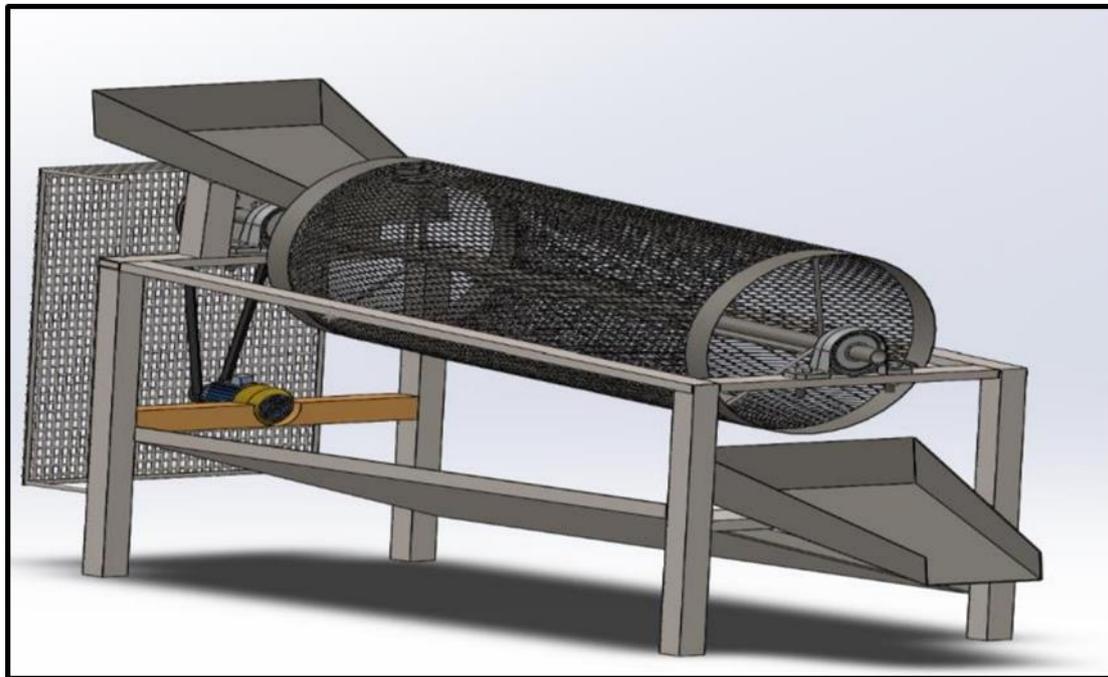
- The problem of size of sand in the market available. Need to spend more money if we want the sand in specific size or category it will increase the budget and time to wait the supplier preparing the goods.
- Now days people always prefer the most suitable way to cut their cost and time. Example in a construction where they have to finish the work before the due date. His might be a problems. Since we have waiting long waiting for the good to arrive.
- However, sometime in big company there are high tech machine that can do this work sieving any sub stand or mixture. But sometime in construction required a special sieve machine that are comfortable and easy to use.
- Traditional method give low efficiency as it is operated manually but the automated sand sieving machine have higher efficiency.
- Traditional method require more labour. Modern machineries require high skill to operate
- Traditional method is more time consumed during the process of preparing the concrete.

WORKING PRINCIPLE:

The sand saperator machine is very easy to construct and can be operated easily. It is very economic among this kind of machines. This project is fabricated with the help of parts like a motor, bearing, caster wheels, sieving box. The sand saperator machine is worked on the basis rotary mechanism. Here it is attached to the sieve box the power is given by motor through pulley belt arrangement. The rail track is attached at the base in which the sieving box moves in it. The sieving box fixed with the crank shaft

in order to move when the crank shaft rotary. The sieving box is placed inside the rail track and the machine is started. When the sieving box moves in the rotary motion the sieving process is performed.

Sieving is a physical mechanism of particle removal, where a particle is denied access through a pore or passageway that is smaller than the particle itself. The fine mesh strainer, also known as the sift/sieve, is a device for separating wanted elements from unwanted material or for characterizing the particle size distribution of a sample, typically using a woven screen such as a mesh or net or metal. In this process, rotary motion produced by DC motor is transmitted to shaft fitted with sieve net using belt drive. Shaft is fitted to framework with the help of bearing. The homogeneous mixture of sand and pebbles are fed from the slider which falls on the sieve net fixed on the rotating shaft. Then due to relative motion between particles and rotating sieve, the particles smaller are passed through the net and remaining particles falls on the other side



Sand Saperater Machine

SCOPE FOR FUTURE WORK:

The project can be made for higher capacities by increasing the dimension and improving the design aspects. Based on the required sand particle size, the mesh can be changed. The machine can be operated using solar energy also which is economically useful

CONCLUSION:

Concluding the project up to now after research four different types of sieving machine was conceptualized to select the best considering every factor to make it more efficient, portable and easily operable. Then the required materials were selected by market study although the fabrication process was undoable due to condition occurred we continued the design process in Solid works and some preliminary calculations. This report also includes to do method of construction and research design flowchart and the Gantt chart. According to calculations and assumptions, this type of sieving machine will be efficient and easily operable, which can help society to learn new way of sieving sand.

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