



Review On Motorized Sand Filtering Machine

Prof. Tanuja Hulavale¹, Abhisek Mishra², Rushikesh Pardeshi³, Anuz Zuzam⁴, Vishal Erande⁵,
Sadanand Gawade⁶

¹ Assistant Professor Mechanical Engineering Vidya Prasarini Sabha's College of
Engineering and Technology ,Lonavala

²³⁴⁵⁶ Student Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and
Technology ,Lonavala

Abstract

A demonstration of design and fabrication of motorized sand filter system is done. As sand is used in construction, manufacturing and many industrial purposes, it needs to be filtered and separated from unneeded particles, stones and other large particles before put to use. This system puts forward a fully automated sand filtering and separator that automatically filters the sand poured on it. For this a motorized shaft is mounted horizontally on the mounts. The shaft is connected to a filter frame with a mesh below and enclosed frame on sides which operates the motor when switched on.

1.Introduction

Sieving machine serves is to remove large grains with a small grain through a sieve. Separation occurs when the sand is placed on top of a filter having holes size. The first sieving is done to get rid of the sand with a larger than standard withholding sand filter and the second sieving is done to get rid of the sand with a size too small means that the sand filter is ignored. A 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. Sand substance is one of the most important thing in industrial world. Nowadays the industry need the sand sub stand that are already been process known as sand product. As we know the sand sub stand is mixture with variety other component such as dirt and metal. As we know the way sand is been collected still used the conversional way such as sieving using hand or machine. And human energy is needed to run the process. So to make the process more efficient new technology is needed to help increase the productivity so the human power can be reduce and also can cut the cost of the process. Sand is used in construction, manufacturing and many industries. Sand needs to be filtered and separated from unneeded particles, stones and other large particles before it is put to use. Our system puts forward a fully automated sand filtering and separator system that

automatically filters sand poured on it. Here we use a motorized shaft that is mounted horizontally using mounts. The shaft is connected to a filter frame with mesh below and enclosing frame on the sides. We now have a rod connected from the shaft to the filter frame in a way such as to achieve the best horizontal motion. Also we have a frame to hold the filter frame in place while ensuring proper horizontal motion at the same time. On switching on the motor using our motor controller circuit, the system allows to operate the motor. This allows us to operate the sand filter motion for appropriate sand filtering needs.

1.2 Objective

- To Get the good quality of sands
- Reduce workload
- To Easy to moving at construction area
- To reduce time spent on this activity.
- To analyze the technology according to needs and capabilities.

1.3 Problem Definition

- 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 day's 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. This might be 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 is comfortable and easy use.
- Traditional method give low efficiency as it is operated manually but the automated sand sieving machines have higher efficiency.
- Traditional method requires more labour.
- Traditional method is more time consumed during the process of preparing the concrete.
- The cost of highly sophisticated machine is very high which is not affordable for small scale foundries and low-level contractors.
- Modern machineries require high skill to operate

2. Literature Review

As per Mr. Pranit S. Patil, the experimental effort involved in the modification of a concept element of an apparatus this is suitable of conducting more than one process in sequence, in the common time span the apparatus is showing in excel in production but maintaining the minimum cost .The authors used an inversion of double slider mechanism (scotch yoke technique) with 2 intersecting gears of bevel pair for motion of power at 2 places. This apparatus in sequence working 2 shafts from a 1 media with the output

to conserve power transmission, minimize the amount, increase the output, decrease space of floor required by the equipment.

As per Mr. Nachimuthu A.K , for characterizing the size of particle transformation of a common sieve is a device for filtering required parts from unwanted things this uses a woven screen they are a mesh or net. Authors are concentrated in their modification on, assembly of the mechanical elements of equipment and the instrument of the sieve equipment. Criteria such as strength, safety and mechanical system needs to concern some other ergonomic design were used to obtain fully working sieve equipment body shape.

Puthineedi Pawan Kalyan Babji and et al., Sand is widely used in construction, production of bricks and many ceramic industries. Sand requires be filtering and separating from unneeded elements like stones and other large objects before it is put into the working. Here we are demonstrating the fabrication Screening machine. Our proposed model is a semi-automated sand filtering and it separates the unwanted elements in 3 different sized meshes and stored at the bottom through the specified path. Here we use a motorized shaft that is attached horizontally using mounts. The shafts are assembled to each filter structure with mesh below and coved with frame on the sides. We are connected cylindrical rod from the shaft to the filter frame in a way such as to achieve the best horizontal motion. Also we have a frame to hold the filters frame in place while ensuring required horizontal motion at the common time. Solar plates are used for charging the batteries & that stored energy is used to run the motors. Switching on the motors, allows us to operate the three different sized sand filters at same time for appropriate sand filtering needs and filtered sand is collected at output.

Prof. Praful Randhive and et al., 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

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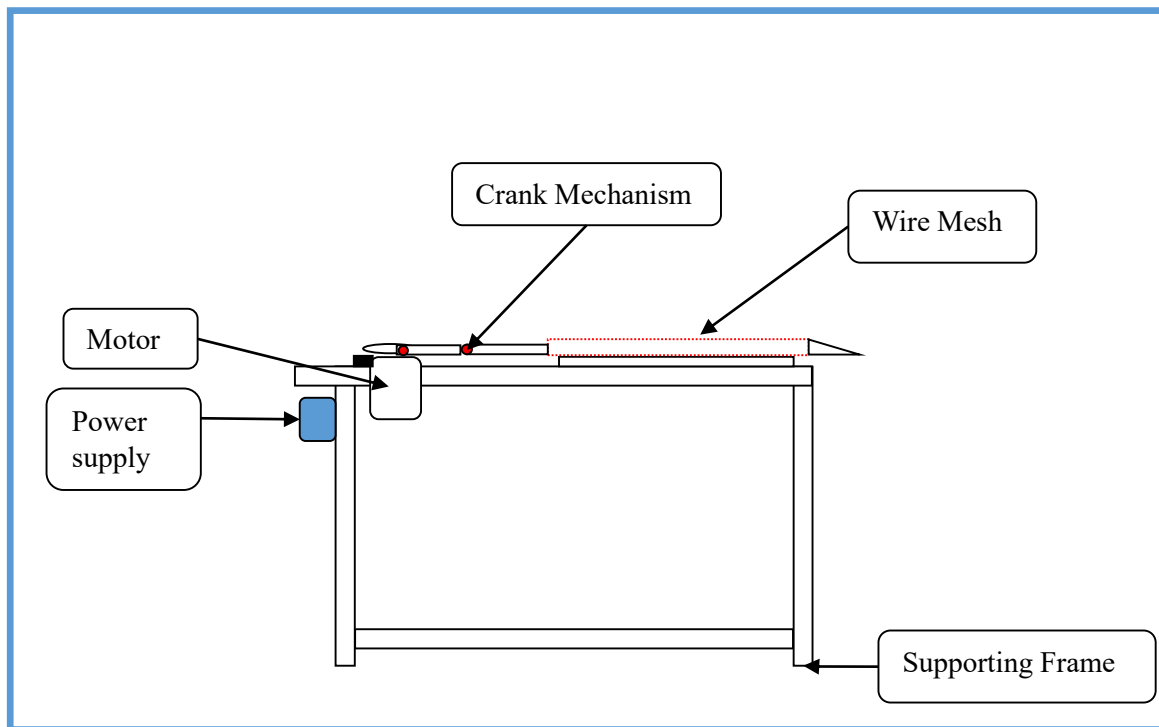
There are different machines that are being used for sand sieving processes. In our project the process will takes place automatically? Thus the time consumed during the whole process of preparing the concrete is reduced.

Md. Shahezad Khan and et al., demonstrate the design & fabrication system. Sand is used in construction, manufacturing and many industries. Sand needs to be filtered and separated from unneeded particles, stones and other large particles before it is put to use. Our system puts forward a fully automated sand filtering and separator system that automatically filters sand poured on it. Here we use a motorized shaft that is mounted horizontally using mounts. The shaft is connected to a filter frame with mesh below and enclosing frame on the sides. We now have a rod connected from the shaft to the filter frame in a way such as to achieve the best horizontal motion. Also we have a frame to hold the filter frame in place while ensuring proper horizontal motion at the same time. On switching on the motor using our motor controller circuit, the system allows to operate the motor. This allows us to operate the sand filter motion for appropriate sand filtering needs.

Parts used in the project

Sr. No.	Name of Resource	Specification	Quantity
1	Wire mesh	-	2
2	Mild steel pipes	25mm Square	20 ft.
3	DC Motor	40-watt, 50 RPM	1
4	Battery	3A, 12vdc	1

3. Diagram of the project



3.1 Working of the project:

The Horizontal sieving 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, crank and slider link mechanism, bearing, caster wheels, sieving box. The horizontal sieving machine is worked on the basis of crank and slider mechanism. Here crank 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 is reciprocated. The sieving box is placed inside the rail track and the machine is started. When the sieving box moves in the reciprocating motion the sieving process is performed.

3.2 Design consideration of the project

Project design may be defined as the iterative decision-making activity to create a plan or plans by which the available resources are converted, preferably optimally, into systems, processes or devices to perform the desired functions and to meet human needs. In fact project design has been defined in many ways but the simplest ways to define project design as “An iterative decision-making process to conceive and implement optimum systems to solve society’s problems and needs.” Project design is practical in nature and must be concerned with physical reliability, or economic and financial feasibility Design is essentially a decision-making process. If we have a problem, we need to design a solution. In other words, to design is to formulate a plan to satisfy a particular need and to create something with a physical reality. **3.2.1 Basic concept of project design:**

Decision making comes in every stage of design. Consider two cars of different makes. They may both be reasonable cars and serve the same purpose but the designs are different. The designers consider different factors and come to certain conclusions leading to an optimum design. Market survey gives an

indication of what people want. Existing norms play an important role. Once a critical decision is made, the rest of the design features follow. For example, once we decide the engine capacity, the shape and size, then the subsequent course of the design would follow. A bad decision leads to a bad design and a bad product.

3.2 TYPES OF PRODUCT DESIGN

There may be several types of design such as

1. Adaptive design

This is based on existing design, for example, standard products or systems adopted for a new application. Conveyor belts, control system of projects and mechanisms or haulage systems are some of the examples where existing design systems are adapted for a particular use.

2. Developmental designs

Here we start with an existing design but finally a modified design is obtained. A new model of a car is a typical example of a developmental design.

3. New design

This type of design is an entirely new one but based on existing scientific principles. No scientific invention is involved but requires creative thinking to solve a problem. Examples of this type of design may include designing a small vehicle for transportation of men and material on board a ship or in a desert. Some research activity may be necessary.

3.2.1 Factors to be considered in project design

There are many factors to be considered while attacking a design problem. In many cases these are a common-sense approach to solving a problem. Some of these factors are as follows:

- (a) What device or mechanism to be used? This would decide the relative arrangement of the constituent elements.
- (b) Material
- (c) Forces on the elements
- (d) Size, shape and space requirements. The final weight of the product is also a major concern.
- (e) The method of manufacturing the components and their assembly.
- (f) How will it operate?
- (g) Reliability and safety aspects
- (h) Inspectibility

3.2.2 Product development process

A product development has to go through the following concepts of product engineering which are given as under.

- Product functions
- Product specifications
- Conceptual design
- Ergonomics and aesthetics
- Standards
- Detailed design
- Prototype development
- Testing
- Simulation
- Design for manufacture
- Design for assembly
- Drafting

Advantages of the project

Advantages of the project as per following like as:

- Simple to construct
- Automatic Filtering
- Easy maintenance
- Fast Filtering
- Human safe
- Easy to Dispose of Unneeded Objects

Disadvantages of the project

Dis-advantages of the project as per following like as:

- High installation cost

Application of the project

Our project should use for following various applications like as:

- Very simple to operate
- It is applicable on all construction sides
- Applicable in dal mill machines

Future scope

The project has covered almost all the requirements. Further requirements and improvements can easily be done since the as per requirements is mainly structured or modular in nature. Improvements can be appended by changing the existing modules

Conclusion

To sum up the project thus far, after doing research, many types of sieving machines were imagined in order to select the best one, considering all factors in order to make it more efficient, portable, and easy to operate, as well as having a high safety factor. This craft was created with locally sourced materials and simple workshop techniques. A market study was used to choose the essential materials. This paper also offers a construction approach and a research design. This type of sieving machine, according to the design concept, will be efficient and simple to operate, allowing workers and contractors to learn a modern technique of screening sand.

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