

Design and Fabrication of Inclined Trommel Automatic Sand Sieve Machine

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Abstract – Now a days construction in our country has extremely grow and work needed to fast at that level decreases the manual work sand sieving machine has the function to sieve sand and stone that mixed together. It gives sand with different grade at high efficiency that manual work. Using machine mechanism driven by electricity power will reduce the time to sieve.

The purpose of this study is to design and fabricate an inclinable multi-layer trommel in sieve machine. That can resolve the problem integrated of flat screens. It now concept to arrange concentrated to trommel having different mesh sizes for each layer using inclination mechanism. The result to use machine obtained high sand feed rate flexibility and grade wise sand. also production of sieving sand increases with decreases the cost and bring many benefits, is positive and very good to continued.

Key Words: Sand, Sieve, Trommel, Sand Sieve, Machine. etc

1. INTRODUCTION

A sand sieve machine design to separate the particle according to their mesh size. Sieve are use for sifting flour has very small holes sand plays a vital role in building construction as it is one of the component so concrete a side from the water and cement. Sand is fragmented, loose, corals or shells naturally occurring material consisting of very small particles of decomposed rocks. From rock formation to a loose fragment, people have through of having much simple ways of acquiring fine sand that can be use for construction purpose. The traditional and common ways of sand screening is by using a wooden frame with screen and works through reciprocating motion. Being free from impurities and the right size of sand and other waste should be considered using point.

A) In order to achieve it undergoes in the process called screening.

B) Sand is made up of the fragment that result when rock is broken down by wind and rain.

Screening is a process using a screen mesh or sieve separation of solid particles of different size. On the basis of mechanism is user there are variety of machines use in screening sand. It can be vibratory are rotary motion and

reciprocating. Most common sieve machines used in small to medium scale construction sites are vibratory reciprocating and rotary. The increasing demand of screening sand for concrete mix is difficult to sustain by manual process so there is necessity to use sieve machine. The sand being screened using this tool depend on the screen mesh size. In order to determine the mesh size, the mesh number system is being utilized.

2. METHODOLOGY

The a compliment of the project as shown in figure involves a wide range of activity such as research, survey, problem and investigation analysis, conceptualization design phase, construction and fabrication, testing, evaluation and final modification.

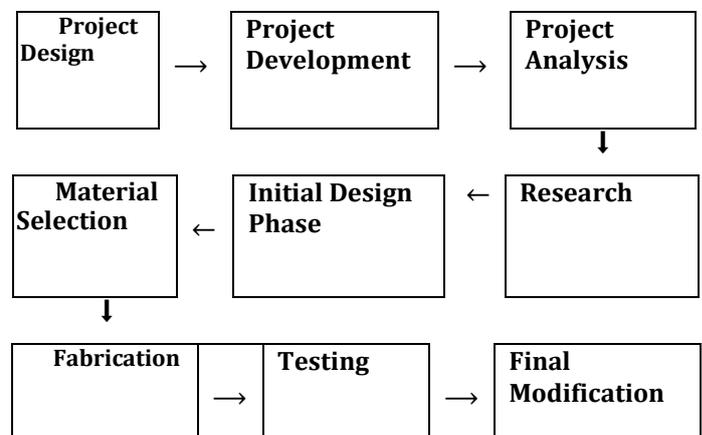


Figure 1. Project development flow diagram.

3. DESIGN;

A) Motor (power Rpm);

The motor use for the controlling the overall construction. In there are four motor are used first for adjustable trommel, second for two conveyor which are place with collision (one onto the another) and the last one for collective performance.

Specification Motor

No of Motor = 4
 DC Supply = 12 v to 24 v
 Torque = 50 Nm.
 Speed = 35 rpm to 55 rpm.

B) Conveyor;

The two conveyor are used and place one onto another in unidirectional, conveyor used to lift the sand from hopper to trommel.

Conveyor

length of conveyor = 30 inch = 762 mm
 length of small conveyor = 12 inch = 304.8 mm

C) Bucket ;

The bucket taking the sand from the sources and transfer the sand to the adjustable conveyor.

Specification Bucket

Hopper Diameter with Bucket = 12 inch
 Capacity of Bucket = 50 gm
 Production Rate = 5 kg/min

D) Hopper ;

Hopper is the structure on it bucket are mounted. Hopper the collect sand through bucket and transfer to a both conveyor.

Specification Hopper

Diameter = 8 inch = 203.2 mm
 Diameter with bucket 12 inch = 304.8 mm

E) Trommel;



Figure 2. Trommel Assembly.

In trommel three sieve were kept. There are screen three particles aggregate high grade, medium and fine. Grade to operate 1-12 degree (0) of inclination,

Specification Trommel

Length of trommel = 457.2 mm.
 Diameter of Trommel = 457.2 mm.
 = 355.6 mm.
 = 254 mm.

F) Switch;

It is used to control the path of machine.

Specification Sand Size

Coarse size = 2 mm to 0.5 mm.
 Medium sand = 0.5 mm to 0.25 mm.
 Fine sand = 0.25 mm to 0.06mm..

Specification Project Dimension

Height = 762 mm.
 Length = 914.4 mm.
 Width = 609.6 mm.

4. CONSTRUCTION & WORKING;



Fig,3



Fig, 3&4 Inclined Trommel Sand Sieve Machine.

It shows the fabrication of sand sieving machine to cover its part. Consisting trommel and conveyor as main part rotary screen i.e. trommel screen is the mechanical screening machine used to separate sand into different grades all components are connected to each other using proper mechanism.

In that machining mechanism to conveyor used one is attached to collective hopper to collect sand using 180° rotation and another attached to trommel at particular inclination. Number of buckets are mounted on conveyor to convey the sand, power is given from 4V motor to conveyor, inclined trommel are mounted on a shaft. Trommel has three stages: high grade stage, shaft receives power from motor and filters the sand into various grades. One end of the trommel is the gaining end and the other end is the discharging end (tail edge).

5. ADVANTAGES:

- 1) To save the time required for filtering sand.
- 2) To reduce the cost of labour.
- 3) For better filter quality of sand requires for work.
- 4) Saving waste of sand.

6. Application ;

A small size construction site, in bridge construction, dam construction, Collect sand from river, deserts, beach, to transfer sand from floor to floor.

7. Conclusion;

Based on the result of the study, the design and fabrication of inclinable sand sieving machine satisfied the requirement of the objective. and this is scoping in future basic object is to find various grades of sand to reduce the cost in filtering and work fast to maintain good quality of sand for lifting sand automatically.

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