

Sand Sieving Machine

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Abstract- *The sand sieving machine is a mechanical device designed to separate sand particles based on their size and remove unwanted materials such as stones, gravel, and impurities. In traditional methods, sand sieving is done manually using hand sieves, which requires more time, labor, and physical effort.*

The proposed sand sieving machine uses an electric motor, crank and slider mechanism (or rotary drum), shaft, bearings, and mesh screen to perform the sieving operation efficiently. The machine works by vibrating or rotating the sieve, allowing fine sand to pass through the mesh while larger particles remain on the screen.

This machine improves productivity, reduces human effort, and ensures uniform sand quality. It is simple in construction, cost-effective, and suitable for construction sites and small-scale industries

Keywords: Sand Sieving Machine, Vibratory Mechanism, Electric Motor, Mesh Screen, Shaft, Bearings, Construction Equipment, Material Separation, Labor Reduction, Efficiency Improvement.

I. INTRODUCTION

Sand is one of the most important materials used in construction work such as concrete preparation, plastering, and masonry. However, sand collected from natural sources contains impurities like stones, pebbles, and dust particles.

Traditionally, sand sieving is carried out manually using a mesh screen. This process is time-consuming, requires more labor, and reduces efficiency. To overcome these problems, a sand sieving machine is designed to automate the process and improve productivity.

II. PROBLEM IDENTIFICATION

In construction work, sand sieving is generally performed manually. This traditional method requires continuous human effort and is very slow. Workers need to shake the sieve repeatedly, which causes fatigue and reduces efficiency.

Another problem is that manual sieving cannot handle large quantities of sand, leading to delays in construction work. The quality of sieved sand is also inconsistent.

III. OBJECTIVE

The main objective of the sand sieving machine is to design and develop an efficient system to separate fine sand from impurities.

- To reduce manual labor
- To increase sieving efficiency
- To save time in construction work
- To obtain uniform sand quality
- To design a simple and low-cost machine

IV. WORKING PRINCIPLE

The sand sieving machine works on the principle of vibration or rotary motion.

When the electric motor is switched ON, it converts electrical energy into mechanical motion. This motion is transmitted to the shaft through a mechanism such as a crank and connecting rod or directly to a rotating drum.

Due to this motion, the sieve vibrates or rotates. Sand poured into the hopper moves over the mesh screen. Fine particles pass through the mesh, while larger particles remain on the surface and are separated.

Bearings are used to reduce friction and ensure smooth operation of the shaft.

V. ADVANTAGES

- Reduces manual labor required for sand sieving
- Saves time and increases productivity
- Produces uniform sand quality
- Easy to operate and maintain
- Low cost and portable design

VI. FOLLOWING ARE THE MAIN COMPONENTS OF AUTOMATED

- Electric Motor
- Shaft
- Bearings
- Mesh Screen (Sieve)
- Frame (Mild Steel)
- Hopper
- Crank and Connecting Rod (for vibration)
- Outlet Tray

1. Electric Motor

Provides power to operate the machine.

2. Shaft

Transmits motion from motor to sieve.

3. Bearings

Reduce friction and support smooth rotation.

4. Mesh Screen

Separates sand particles based on size.

5. Frame

Provides structural support to the machine.

6. Hopper

Used to feed sand into the machine.

VII. CONCLUSION

The sand sieving machine is an efficient and useful device that reduces manual effort and increases productivity in construction work. It provides better quality sand in less time and minimizes worker fatigue.

The machine is simple in construction, economical, and suitable for small and large-scale applications. Therefore, it is an effective solution for improving sand separation processes in construction industries.

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