

Design And Fabrication Of Portable Concrete Mixture Machine

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Abstract

The aim of our paper is design and fabrication of portable concrete mixture machine. Mixer widely used to make a concrete mixture which used to building construction and other industrial application such as concrete block, pipe, sheets, etc. As for all materials, the performance of concrete is determined by its microstructure. To determine the mixing method best suited for a specific application, factors to be considered include: location of the construction site. The concrete mixture machines which are currently available in the market is heavy and having big capacity of concrete mixing. Continuously and easy handling, we have fabricated this concrete mixture machine.

Keywords: portable mixer, design model.

Introduction:

A concrete mixer is also commonly called a cement mixer, is a device that homogeneously combines cement, aggregate such as sand or gravel, and water to form concrete. A typical concrete mixer uses a revolving drum to mix the components. Today's market increasingly requires consistent homogeneity and short mixing times for the industrial production of ready mix concrete, and more so for precast concrete. portable concrete mixer sometimes called a mini mixer. A concrete mixer is compressed primarily of a motor, rotating drum. Inside the drum of material use to make concrete mixing together evenly and remaining soft application and forming. To supply continuously the ready mix its necessary that the concrete mixer should be in good condition of working, but it has been observed that the shaft and blade of mixer get failed after some uses of time. So in this project I am trying to identify the different causes of blade and shaft failure. In this project with the title "design and fabrication of portable concrete mixer machine", we were planning for design and fabrication of a concrete mixer. This project brought advantages over manual mixing and expensive mechanized concrete mixer. In this project Drum is stationary and blade is revolving inside the drum. We used 0.5 HP motor to blend the Concrete properly. We used a pulley and belt arrangement to transmit the power from a motor to shaft on which blades are fixed and this shaft is revolving inside the stationary drum. concrete mixer. It mixes the cement, aggregate and sand properly and increases the productivity. It takes a less time to mix the concrete. Also it produces quality and homogeneous mixture in less time and effort.

Literature review:

"Concrete Mixing Methods and Concrete Mixers: State of the Art Journal of Research of the National Institute of Standards and Technology. By Chiara F. Ferraris". States that, The efficiency parameter of a mixer are affected by the order in which the various constituents of the concrete are introduced into the mixer, the type of mixer, and

the type and magnitude of forces on the shaft and the direction they acted in. and used to improve the mixing quality, to reduce the stirring resistance, to reduce the failure of shaft and blades and power consumption

Methodology:

Design

1) Pre-models

2) Main design

Raw material selection as specification of machine.

Motor selection according to specification.

Fabrication of individual parts and assembly.

Trial and Error finding.

Rectification.

Result and conclusion.

Design:

Drum:

A concrete mixer is a device that homogeneously combines cement, conglomeration such as sand or gravel, and water to form concrete. A typical concrete mixer uses a revolving drum to mix the components. Cement, sand and other aggregates are loaded in a hydraulically operated hopper and then poured in the mixing drum for final mixing and then can be unloaded by tilting the drum.

Specification:

Parameter : Drum

Quantity= 1

Material type= MS

Dimension=:D-610mm,

H-880mm

Motor specification:

Electric motor=0.5 HP

RPM of motor =400

Shaft dia= 20mm

Pulley dia= 8.89mm

Shaft:*Shaft of concrete mixer is mounted concentrically at the center of the Drum. Electric Motor, Metal Bucket/ the mixing trough, Shaft Pulley, Motor Pulley, Set of blades mounted on the shaft, Bearings, Shaft, Supporting flat belt.*

Pulley:*A pulley is wheel on axle or shaft that is design to support moment and change of direction of belt. A pulley is a simple machine that is used to lift heavy objects.*

specification:

Parameter= Pulley

Quantity=3

Material type=MS

Dimension=3inch,5inch,9inch

Chain:A series of linked metal rings use for fastening sequencing of atoms of the same type .A chain type of ring connected to fitted into one another and use for various purpose.

Specification:

Parameter =Chain

Quantity = 1

Material type =Cast iron

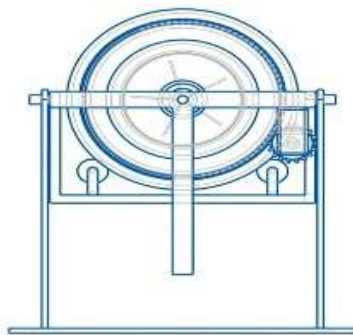
Dimension= 1916mm

Blade: The blade is flat cutting edge of knife saw, or other tool the flat wide section of an implement or device such an propeller a long, narrow leaf of grass or another similar plant

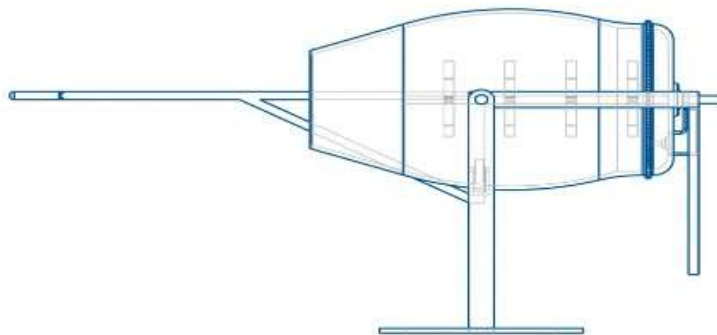
Fabrication:



Different views of model



Front View



Side View

Working: A portable concrete mixer is a device that homogeneously combine concrete , aggregate such as sand or gravel , and water to form concrete a powered device that mixer concrete with water and aggregate, such as sand or pea gravel, to make concrete. Concrete mixers range from the very large commercial mixing truck to the smaller, portable concrete mixer sometimes called a mini mixer. A concrete mixer is comprised primary of motor, a rotating drum, and the materials used to make concrete spin around, mixing together evenly and remaining soft for application and forming. Today's market increasingly requires consistent homogeneity and short mixing times for the industrial production of ready –mix concrete, and more so for precast concrete. This has resulted in new technology for concrete production. They are easily carried from slab to slab and used in making cement for column construction and plastering. Composition of material in proper to use construction, small slab, flooring. Mini concrete mixer features:

1. 360 degree for easy and complete discharge.
2. Easy to tow
3. Easy to carry from slab to slab
4. Heavy duty drum & heavy duty M. S. BLADES

Our machines are designed keeping in the current labor problem. The rising labor costs and unavailability is hindering you to meet your goals & timelines. Let's clarify the difference between cement and concrete. Concrete is made by combining the three ingredients in a mixer, whether that mixer is stationary or driving down the road, and water is absorbed by the cement, which then binds the aggregate together, creating concrete. Batch mixers are becoming more important for high quality concrete production. They introduce very high turbulence into the mix and achieve about 95% homogeneity at only around 30 seconds mixing time per batch.

Future scope:

We can add steel sheet, as a coat to the inside portion of the mixing drum to avoid it from corrosion and improve its life.

Conclusion:

1. Mixing is a complicated process that is affected by the type of mixer, the mixing cycle as defined by the duration, the loading method, and the energy of mixing.
2. For most machine shafts, however, analysis should be relatively straightforward. That's because the failure typically provides strong clues to the type and magnitude of forces on the shaft and the direction they acted in. The failed parts will tell exactly what happened.

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