Multistage Stage Sand Separator and Filter

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Abstract

Sand is need to construction, manufacturing and industry Sand need to be filtered and separated from unneeded particles, stones, different sizes 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 stepped pulley. The shaft is connected to a filter frame with mesh below and this frame enclosed on the sides. We use a rod connected from the shaft to the filter frame in a way such as to achieve the rotary motion to reciprocating motion. We will used this reciprocating motion to vibrate a separator. The separator is vibrate then sand fall down with proper size of separator and we will gate thee different sizes of sand in separate compartment of frame.

Keywords- Sand, Motor, Pulley, Shaft, Belt, Separator

I. INTRODUCTION

Multistage sand separator and filter is very efficient method for separating sand in three different sizes. Small size sand is use for plaster, medium size sand column and large size sand use making floor in building. In construction site or industry separating sand is very time consuming .save this time and complete all construction within given time period we can use multistage sand separator and filter.

Making of this Multistage sand separator and filter we use efficient mechanical tools such as V-belt, step pulley, electric motor, different material, different size separator and filter.

We view papers on V-belt, electric motor, step pulley and material selection.

Collecting information on belt conveyor

1) Konakalla Nagasriananth , Vaitlarakesh , Pothamsettykasi Visweswarao , April 2013/43-49 , "Design and selecting the proper conveyor-belt" ,IJAET , Vol.IV, Issue II

We understood from this paper Belt conveyor is used for the transportation of material from one location to another. Belt conveyor has high load carrying capacity, large length of conveying path, simple design, easy maintenance and high reliability of operation. Belt has made up of different types of material such as rubber, elastomer etc. for abrasive and dusty side belt power transmission is very useful. This paper provide to design the conveyor system used for which include belt speed, belt width, motor selection, belt specification, shaft diameter, pulley, gear box selection, with the help of standards model calculation.

We take information about electric motor from,

2) Saurabh Chauhan, August 2015,"Motor torque calculation for electric vehicle" , IJSTR,Vol.4,Issue08,

We learn electric motor is an electrical machine that converts electrical energy into mechanical energy. These reverse of this is the conversion of mechanical energy into electrical energy and is done by an electric generator, which has much in common with a motor.

3) We learn basic about step pulley into V.B.Bhandari "design of machine element."

We understood Step pulleys have two or more non-adjustable grooves which have different pitches located around the same shaft. Pulleys change the speed ratio of the transmission.

A step pulley is a system of pulleys made up of many different sizes. The typical step pulley consists of a two- to four-pulley configuration. This type of step pulley is found on equipment such as a drill press where different operational speeds can be produced simply by changing the belt to a different pulley size. The step pulley is always operated in pairs, and when the belt is changed on one pulley, it is also changed on the corresponding pulley on the other side of the belt.

4) Material selection the project constructed will multistage sand separator and filter; equipment for three different sand sizes. This will we can construct using a mild steel material. This is because of the excellent high qualities of mild steel such as; durability tensile strength, high corrosion resistance and also relative in cost compare to other special alloyed materials, like stainless steel.
5) Sugar filtration paper of Avinash Kumar Agarwal1#, Mukesh Sharma2# and L P Tewari 3#Departments of Mechanical1 and Civil2 Engineering Indian Institute of Technology Kanpur National Sugar Institute 3 Kanpur

The study on sugar filtration plan improvement in technology, which is simple, cost-effective and can be installed and operated by semi-skilled village level technicians and operators. The specific technological improvements recommended and adopted by Khandsari industry include improved suphitation process for juice clarification, usage of filter press for juice recovery from press mud, design of crystallizers for uniform crystal formations etc. These process modifications have led to significant improvements in sugar recovery, which has gone up to 7.5% from 5.5% as in the case of traditional Khandsari process. Enhanced recovery will make the industry more competitive and it is hoped that the historic Indian Khandsari industry.

6) Purification of Strom Water Using Sand Filter Culp, R., Wesner, G., & Culp, G. (1978). Advanced Waste-water Treatment. New York: Van Nostrand Reinhold Company.

We learn from this research paper to use other parameters in the investigation to better measure the percent removal achieved by sand filter such as (Metals, BOD, NH3…). It is recommended to apply the experiment in large scale for example using tank filled with media. Through the work of laboratory tests, we seemed the importance of the subject of maintenance for sand filter, it is recommended to giving this issue a priority by bodies which responsible to operation such treatment facility.

Using from this filter we purify runoff water without get polluted witin economical cost.this filter is get made from many laboratory test. This research results during three days of infiltration show that the sand filter can provide purified water with a concentration of suspended solids less than 20 mg / liter at a depth of 75 cm and completely removes fecal coliform bacteria at a depth of 150 cm. Finally, the research tested the increased concentration of suspended solids or fecal coliforms and found that no significant impact of that on the purification and the percentage of removal, but it is expected increase the occurrence of clogging in the filter.

7) We take information about different filter paper from Hahnemühle Fine Art GmbH internationally active company. ultrapure cotton linters and cellulose is make entirely without any additives to ensure that no interference will occur with the reagents and their detection reaction -Tested specifically like chromatographic and blotting papers to ensure high and uniform capillary actions and a homogenous dispersion of the impregnation solution -High consistency in thickness and capillary force over the whole paper roll and from lot to lot -High wet strength for safe handling during reel-to-reel impregnation Technical Data Grade Material Weight [g/m²] Thickness [mm] ,Absorbent materials for producing diagnostic tools as IVD's have to meet very specific characteristics. The Hahnemühle absorbent media guarantee both, high and consistent performance. Purest available raw materials are used to produce this media and assure that there is no cross contamination with the chemicals in the final test device. Hahnemühle offer a variety of cellulose, cotton linters and glass fibre filters that have been the first choice for device manufacturers of Lateral Flow and Flow Through assays, as well as dip sticks, such as a critical "Point of Care" urine test strips.

II. CONCLUSION

We have referred various research paper about this topic. There is many more work is done on this topic. By referring various paper we have to design one model of multistage sand separator and filter. It is three stage rectangular design. Which runs at three different speed with the help of stepped pulley and v-belt .We get sand in three different size. The also aims to make easy and simple model which can be used by small construction side also.

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Basic

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