

Solar Sand Separator And Sand Filter

M.Thippeswamy¹, Dr.M.Yohan²

¹Dept of Mechanical Engineering

²Professor, Dept of Mechanical Engineering

¹JNTUA College of Engineering, JNTUA, Ananthapuram, Andhra Pradesh, INDIA

²Faculty Development Cell, Jawaharlal Nehru Technological University, Ananthapur, Ananthapuramu, Andhra Pradesh, INDIA

Abstract- Sand filtration 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.

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 pillow bearings. The shaft is connected to a filter frame with mesh below and enclosed. We now have a connecting rods 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 solar energy, the system allows to operate the motor. This allows us to operate the sand filter motion for appropriate sand filtering needs.

Keywords- Solar Panel, DC Shunt Motor, Battery, Ball Bearing System, Mesh, Connecting Shaft, Sand.

I. INTRODUCTION

Sand filtration 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.

The main aim of the project is fabrication of solar sand separator and sand filter. It will work based on the energy provided by the solar panel. 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.

A solar cell or photovoltaic cell is a device that converts solar energy into electricity by the photovoltaic effect. Sometimes the term solar cell is reserved for devices intended specifically to capture energy from sunlight, while the term photovoltaic cell is used when the source is unspecified. Assemblies of cells are used to make solar panel, solar modules, or photovoltaic arrays.

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II. LITERATURE SURVEY

Heinrich Arnold1 November 2001: Rather long reinvestment cycles of about 15 years have created the notion that innovation in the machine tool industry happens incrementally. But looking at its recent history, the integration of digital controls technology and computers into machine tools have hit the industry in three waves of technology shocks. Most companies underestimated the impact of this new technology. This article gives an overview of the history of the machine tool industry since numerical controls were invented and introduced and analyses the disruptive character of this new technology on the market. About 100 interviews were conducted with decision-makers and industry experts who witnessed the development of the industry over the last forty years. The study establishes a connection between radical technological change, industry structure, and

competitive environment. It reveals a number of important occurrences and interrelations that have so far gone unnoticed.

Dr. Toshimichi Moriwaki (2006): Recent trends in the machine tool technologies are surveyed from the viewpoints of high speed and high performance machine tools, combined multifunctional machine tools, ultra precision machine tools and advanced and intelligent control technologies.

Frankfurt-am Main, 10 January 2011. : The crisis is over, but selling machinery remains a tough business. Machine tools nowadays have to be veritable “jack of all trades”, able to handle all kinds of materials, to manage without any process materials as far as possible, and be capable of adapting to new job profiles with maximized flexibility. Two highly respected experts on machining and forming from Dortmund and Chemnitz report on what’s in store for machine tool manufacturers and users.

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 are 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.

III. WORKING PRINCIPLE

The working of machine is describe as follow. The sand is dumped into the channel which is placed at the top of the machine and guides the sand to enter into the tapered cylindrical mesh. The channel is designed in such a way that it acts as a pathway to the sand so that there will be no spillage. When the sand enters the cylindrical mesh with the help of channel, the tapered cylindrical mesh draws power from the motor with the help of motor drives and starts rotating, this power comes from solar panel, as the tapered cylindrical mesh rotates the large size particles gets separated from the small size particles and the large size particles will remain inside the tapered cylindrical mesh. This fine particle of sand which is sieved enters the housing through the channel which is provided below the tapered cylindrical mesh. Remove the large particles from the sand. When the sieved sand enters the cylindrical shape of mesh is housing an opening is provided where the sand, sand mixer will push the mixture out of the housing with least possible time. In the frame is provided at

the bottom which provides mechanical support and reduces or minimizes the vibration problems. Bearings are used while mounting the shafts of ribbon mixer and cylindrical mesh onto the frame. These bearings provided will avoid friction between the moving parts and support radial or axial loads.

Working principle of vibrating screen are Vibrating screen use motor vibration as excitation source, to throw the materials on the screen, While forward by linear motion, the material from the feeder uniform enter feed mouth of screen. Through multi-storey screen to produce different size product on the sieving or under the sieve, then discharge from their output opening. Normally use in production line after crushing.



Figure 1: Sand Separator and Filter

IV. METHODOLOGY

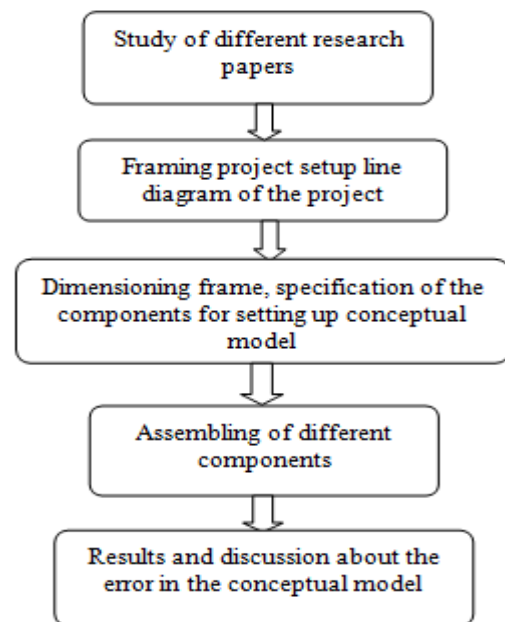


Figure 2: Flow Chart

V. SOLAR PANEL

A solar cell or photovoltaic cell is a device that converts solar energy into electricity by the photovoltaic effect. Sometimes the term solar cell is reserved for devices intended specifically to capture energy from sunlight, while the term photovoltaic cell is used when the source is unspecified. Assemblies of cells are used to make solar panel, solar modules, or photovoltaic arrays. Photovoltaic is the field of technology and research related to the application of solar cells for solar energy. Solar cells can also be applied to other electronics devices to make it self-power sustainable in the sun. There are solar cell phone chargers, solar bike light and solar camping lanterns that people can adopt for daily use.



Figure 3: Solar Panel

VI. BATTERY

A rechargeable battery, storage battery, or accumulator is a type of electrical battery. It comprises one or more electrochemical cells, and is a type of energy accumulator. It is known as a secondary cell because its electrochemical reactions are electrically reversible. Rechargeable batteries come in many different shapes and sizes, ranging from button cells to megawatt systems connected to stabilize an electrical distribution network. Several different combinations of chemicals are commonly used, including: lead acid, nickel cadmium (NiCd), nickel metal hydride (NiMH), lithium ion(Li-ion), and lithium ion polymer (Li-ion polymer).



Figure 4: Battery

VII. IMPLEMENTATION

SOLAR SAND SEPARATOR AND SAND FILTER

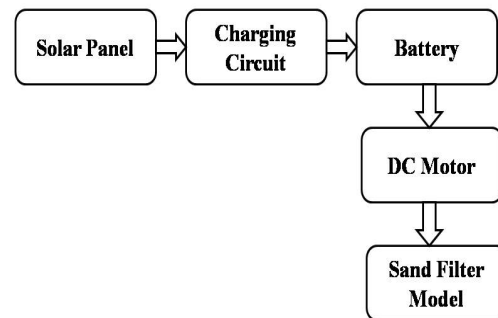


Figure 5: Block diagram of Fabrication of Solar sand separator and sand filter

From the above figure, we can see that the device which is able to perform the task is based on solar energy.

VIII. CONCLUSION

The solar sand separator is easily accessible, safe and practical with limited maintenance requirements because of few mechanical parts. It is ideal not only for the experienced cyclists but also for those non-athletes, the elderly and individuals with health problems. This is the best source to replace the fuel which is exhausting day by day and becoming more costly

This design has a short range of stand which is so flexible to support the project from failing Down during process. This use a light material and easy to carry and store. The advantage is this design is easy to fabricate because less the core material used and the design is simple only consist few part. The disadvantages of this design is it unbalance due to single rod to hold the casing.

IX. ACKNOWLEDGEMENT

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