

Design and Fabrication of Polythene Bag Sealing Machine

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Name of Guide: Mr. Mahesh Kale

Abstract

To satisfy requirements for productivity, versatility and flexibility, the continuous sealing machine was specified. A continuous bag sealing machine for heat sealable bags is provided. There are a number of heat sealing techniques which are used to produce flexible pouch or bag using the laminate films. Compared to the others, plate sealing uses the least expensive equipment hence it is the most preferred technique. Heat seal is formed by bonding together two polymer surfaces in the way that the surfaces are forced into intimate contact while they are in at least a partially molten state. A single DC motor operates the rotation of the sealing bands as well as the conveyor unit. The machine includes a conveyor belt upon which the bag to be sealed is moved. The upper portion of the bag is gripped by a double pair of Teflon coated belts and is moved through the machine to a heating bar which heat and seals the top of the bag. After the sealing bar, the bag is then pressed through and adjustable pressure wheel to give a tight air/water tight seal. Adjustable pressure wheel is attached by spring mechanism to avoid obstacle of pressure adjusting knob. Polyethylene is a plastic. Some of its properties include burning well, not conducting electricity, and being insoluble in water and the majority of organic solvents. Polyethylene is a thermoplastic. This means that it melts when heated, so it can be reshaped. This material is produced by decomposing petroleum distillates into small ethane molecules that are reactive and can be rearranged. The two main groups of polyethylene are HDPE, or high-density polyethylene, and LDPE, or low-density polyethylene.

Bidirectional Floating Hydro-turbine

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Guide: Mr. Prasad V. Bapat

Abstract

Electricity generation using Floating Hydro-Turbine works on the basic principle of Hydroelectric Generator. Waterpower is the combination of HEAD and FLOW. Head and Flow are the two most important things you need to know about the site. Every aspect of a hydro system revolves around Head and Flow. The generation of electricity is simply the conversion of one form of power to another. The turbine converts water power into rotational power at its shaft, which is then converted to electrical power by the generator. Hydropower converts the energy in flowing water into electricity. The volume of water flow determines the quantity of electricity generated and the amount of "head" (the height from turbines in the power plant to the water surface) created by the dam. The greater the flow and head, the more electricity produced. A typical hydropower plant includes a dam, reservoir, penstocks (pipes), a powerhouse and an electrical power substation. The dam stores water and creates the head; penstocks carry water from the reservoir to turbines inside the powerhouse; the water rotates the turbines, which drive generators that produce electricity. The electricity is then transmitted to a substation where transformers increase voltage to allow transmission to homes, businesses and factories.

Design and Development of Condensation System for a Steam of Distillation Plant

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Guide: Mr. Ashish Chaudhari

Abstract

Condenser is a type of heat exchanger, in which the vapor undergoes phase change. It is heat rejecting equipment. There are three types of condenser: Air cooled, water cooled and evaporative. In this model we used water cooled shell and tube type of condenser. The cooling water remove the heat form steam generated from distillation plant. Working principle: steam at temperature T_1 rejects heat at constant pressure up to saturated vapor line and temperature goes decreasing up to T_2 . Then vapor starts changing its phase from vapor to liquid at constant temperature up to liquid line.

Our objectives are to build the condensation system for distillation plant and convert it into pure potable water and also to increase the rate of condensation. To convert sewage water into potable water distillation plant is constructed. By using external heat from parabolic solar collector steam is generated in distiller using sewage water. Sewage water primarily filtered through sedimentation tank. Sedimentation tank consist of natural filters like charcoal, pebbles, sand, cotton etc. Then sewage water is used as cooling water in condenser which flows through shell. Steam flows through tubes. The Flow of sewage water from condenser to distiller is controlled by float valve. Steam rejects the heat to cooling water, and changes the phase from vapor to liquid.

Design and Development of Solar Water Distillation Plant

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Abstract

We have design a model which will convert the sewage/saline water into pure or portable water by using the renewable source of energy. Solar energy has been utilized for sewage water vapourisation in the distillation box. Solar energy is a clean source of energy. Solar distillation plants are easy to construct, simple in operation, less maintenance and the output depends upon the amount of solar radiations. Solar distillation plant are used for supplying desalination water to small communities nearby costal remote areas. Water desalination using solar energy is an alternative for countries like India, Oman, Saudi Arabia which has a sunny weather all around year and where the length of the day time range between 11-14 hours. The aim of present study is to design and test the solar water still for Indian climate and to investigate the effect of different design parameters on the still thermal performance. The result are obtained by evaporation of the sewage/ saline water and fetching it out as pure drinkable water.

Design and development of parabolic trough collector for heating water in distillation plant

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Abstract

Solar energy is abundant in nature and which otherwise get wasted due to improper utilization and storage. Concentrated solar power technologies are gaining interest in various sectors including power plants, purification plants and many more due to good potential for scaling up renewable energy at utility level. The motivation for this project is the scarcity of pure water resources and enormous availability of impure water which can be processed into potable water. Therefore the solar collector has been used to utilize the solar energy efficiently. This report contains the detailed design and modelling of solar collector for heat generation for evaporating sewage water from distillation chamber. To achieve such goals the concentrating collector namely parabolic trough collector has been used. Due to the fantastic performance of parabolic trough collector, it has been an alternative sources for power generation sectors in compared with other conventional power generation plants. In addition to the parabolic trough collector the project consists of an evacuated tube which helps to improve the heating effect which results in more efficient performance of the project. The actual model which is made up of reflecting material, foundation or base structure material, receiver pipe were fabricated using locally sourced material for rural applications point of view. The incoming solar ray or radiation from our sun is focused and concentrated on receiver pipe which result in generation of steam and heat which will be efficiently utilized by distillation chamber. The parabolic trough collector has been tested for the temperature gained and amount of steam generated in the span of ten hours. The steam generated has gained the average maximum temperature of 102°C. Also the maximum thermal efficiency achieved by the collector is 78%. The future scope for this project includes fabrications, precise solar tracking mechanism and optimum material research.

Design and Fabrication of Mechanical Incubator

Mr. Zaid A. M. Kazi

Mr. Rakesh A. Lolam

Mr. Akshay A. Kamble

Mr. Sourabh S. Mahadik

Guide : Mr. Balagouda Patil

Abstract

An incubator is a device which artificially creates environment and conditions which are required for hatching of egg. Four factors are of major importance in incubating egg artificially: temperature, humidity, ventilation and turning. In modification to regular mechanical incubator, we can use incubator which works solar energy. Since, solar energy is available in large scale so it is convenient to use it as a source of power for incubator. Many regions in India for example some places in Marathwada have shortage of electricity so here we can use solar incubator on large scale. Development of solar incubator will be of great use of society. In this study, a solar powered chicken egg incubator was designed, fabricated and its performance was to be checked. The major components of this incubator are incubation unit, temperature controller and solar PV system. The incubator was generally designed to maintain constant temperature of 40 °C and humidity between 50% to 60% throughout 21 days period. Engineering equations regarding heat, mass and other factors regarding temperature were used to design the different components of mechanical incubator

Optimization of idle time in disc brake manufacturing

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Mr. Suraj S. Shinde

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Guide Name:

Mr. Prasad V. Bapat.

Abstract

Multi-spindle drilling head is designed and manufactured for specific jobs and such a never produced in bulk such heads are finding increasing use in industries the techniques for designing such machine heads would obviously be quite different from those used for mass produced machine head. A very keen judgment is essential for success of such machine heads. Broadly the special purpose machine head could be classified as those in which machine remain fixed in one position and those in which job moves from one station to another. Multi-spindle drilling head is using for drill the three hole on circular plate. Which is having uniform profile diameter same as the profile diameter of multi-spindle drilling head. For multi-spindle drilling head we are using radial drilling machine. The main advantage of multi-spindle drilling head is reduce holding time in drilling operation and drilling cost of the disc brake manufacturing. This multi-spindle drilling head is useful for mass production.

Design And Fabrication of agriculture Weeder

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Abstract

Every year in INDIA, an average of 1980 Cr of rupees is wasted due to weeds. Our country faces the total loss of 33% of its economy from Weeds. The Losses are due to some of the following reasons, total loss of 26% from Crop Diseases, total loss of 20% from Insects and Worms, total loss of 6% from Rats. Has been Surveyed. Shrinking farm lands, acute labour shortage, decreasing income per acre of cultivation, and economic frustration are some of the key factors hurting a farmer's confidence in continuing farming. It has always been a problem to successfully and completely remove weeds and other innocuous plants. This work involved the design and construction of mechanical weeder,. As a solution to these problems, mechanical weeder was designed and constructed. The mechanical weeder was made of two implements attachment i.e. the primary cutting edge which is in front to loose soil above and the secondary cutting edge which is behind to do cutting and lifting of weeds. The overall machine field efficiency was 98.67%. The Single Wheel Weeder being manufactured is the equipment, which is used for very special purpose when the weeding is required at narrow places or between rows. The blade is thin but very sturdy and tough besides, it is very safe to use and offers zero threat of hurting to the user, Other than the wheel, there is nothing mechanical in this single wheel weeder but, it works wonderfully under the condition where it is put into. This hassle free equipment requires no special maintenance. It is necessary to design the weeder which minimize the human effort and provide efficient work output. The tool which is designed is able to fulfill the present requirement for the weed control. The present design is directed to an improved manual tilling, mulching and weeding tool.

Optimization of idle time in disc brake manufacturing

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Abstract

Multi-spindle drilling head is designed and manufactured for specific jobs and such a never produced in bulk. Such heads are finding increasing use in industries. The techniques for designing such machine heads would obviously be quite different from those used for mass produced machine head. A very keen judgment is essential for success of such machine heads.

Broadly the special purpose machine head could be classified as those in which machine remain fixed in one position and those in which job moves from one station to another. Multi-spindle drilling head is using for drill the three hole on workpiece. Which is having uniform profile diameter same as the profile diameter of multi-spindle drilling head. For multi-spindle drilling head, we are using radial drilling machine.

The main advantage of multi-spindle drilling head is reducing holding time in drilling operation and drilling cost of the disc brake manufacturing. This multi-spindle drilling head is useful for mass production.

Keywords: Multi-spindle drilling head, special purpose machine.

Mechanical Property Analysis of Aluminum Alumina Composite by Varying The Percentage of Alumina

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Guide:

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ABSTRACT

Composite materials are known for their weight to strength ratio. In this work detailed literature review is done for manufacturing and selecting the composition of composite material. Aluminium is selected as matrix material and Alumina as reinforcement composition of these materials is based on literature review. Manufacturing of this composite is done by stir casting method. Once the composite is manufactured, specimens are formed using ASTM Standards for Tensile and Hardness test. Test result and microstructure analysis reveals that mechanical property of the composite is increased by adding the percentage of the reinforcement Alumina and distribution of Alumina is uniform in the composite material. Which enhances the mechanical property of composite materials.

Keywords - Aluminium, Alumina, Stir casting, Composite, Mechanical Property

Design and Fabrication of Mechanical Incubator

Submitted in partial fulfilment of the requirements

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Bachelor of Engineering

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ABSTRACT

An incubator is a device which artificially creates environment and conditions which are required for hatching of egg. Four factors are of major importance in incubating egg artificially: temperature, humidity, ventilation and turning. In modification to regular mechanical incubator, we can use incubator which works solar energy. Since, solar energy is available in large scale so it is convenient to use it as a source of power for incubator. Many regions in India for example some places in Marathwada have shortage of electricity so here we can use solar incubator on large scale. Development of solar incubator will be of great use of society. In this study, a solar powered chicken egg incubator was designed, fabricated and its performance was to be checked. The major components of this incubator are incubation unit, temperature controller and solar PV system. The incubator was generally designed to maintain constant temperature of 40°C and humidity between 50% to 60% throughout 21 days period. Engineering equations regarding heat, mass and other factors regarding temperature were used to design the different components of mechanical incubator.

Keywords - Eggs, fertility, hatchability, Incubator, solar energy

Design and Fabrication of Square hole Drilling Accessory

Submitted in partial fulfillment of the requirements
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Abstract

This concept discusses the mechanical design and simulation of a square hole producing tool based on Reuleaux Triangle. The main aim of this paper is to investigate how a circular motion can be converted into a square motion by purely a mechanical linkage; an application of which is to construct a special tool that drills exact square hole. A geometrical construction that fulfills the laid objective is Reuleaux Triangle. Additionally, for this geometry to work from a rotating drive (such as a drill press) one must force the Reuleaux triangle to rotate inside a square, and that requires a square template to constrain the Reuleaux triangle as well as a special coupling to address the fact that the center of rotation also moves. The practical importance of this enhancement is that the driving end can be placed in a standard drill press; the other end, when restricted to stay inside the ambient square, will yield a perfectly square locus and this can be turned into a working square-hole drill. The developed design had a success rate of 98% i.e it removed approximately 98% area of the desired square. The fabrication of the developed design in this paper has been done on wood that is ideal for soft surfaces but if harder materials are used, hard surfaces application is also possible.

Keywords: Reuleaux Triangle, Square-hole

**Design and fabrication of multinut opener and tightner for
the wheel with PCD 114**

Submitted in partial fulfilment of the requirements

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Bachelor of Engineering

by

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Abstract

Vehicle is an important machine in human daily life. Nowadays, each family has at least one car to make the transportation easy and faster. For a car, the tool set-up for each vehicle is a T-nut wrench and car jack which is hard to use for any human beings to open their car's nut.

As the standard of living in India has increased, most of the families have at least one vehicle, typically a car to move easily and quickly. With the increment of the number of cars in the road, the number of cars problem due to tyre failure has increased. Often, the car is provided with tyre wheel nuts remover and jack for instance spare tyre replacement. Nevertheless, due to the difficulty in applying the required torque to remove the nuts, most of the time, driver rely on the tow truck and available nearest mechanic to solve the problem. This always happen to the elderly or female drivers. Based on the capability of torque application by these drivers, a vehicle all-wheel-nuts remover is designed. The remover is designed to be ergonomic to be used, easy maintenance, easy storage, easy to handle and able to remove all nuts at once. The design of the remover is based on standard pitch circle diameter (PCD) of 114 mm and 4 numbers of nuts for most of the cars available

The main advantage of multi nut remover is it reduces torque required to remove nuts and saves time required to remove the nuts of wheel

Design and Fabrication of Hydraulic Ram Pump

Submitted in partial fulfillment of the requirements

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Abstract

An engineer is always focused towards challenges of bringing ideas and concepts to life. Therefore, sophisticated machines and modern techniques have to be constantly developed and implemented for economical manufacturing of products. At the same time, we should take care that there has been no compromise made with quality and accuracy.

To pump water requires an energy, so energy saving is one of the key matters from view point of power consumption and for protection of global environment. So it is necessary that a significant and concrete effort should be made for conserving energy through making use of potential energy of water.

The main objective of this project Hydraulic Ram Pump is to pump the water without any power supply. This water can be used for number of domestic purpose. In minimum constructional, maintenance and running cost, this system is much useful for domestic purpose. It is valuable alternative approach to improve overall efficiency and use the running water of river, stream. The study has shown that the system is technically feasible and economically viable.

Keywords : Water Hammer Effect, Hydram, Volume Flow Rate, Power, Efficiency, Impulse Valve, Delivery Valve.

Design and Fabrication of Pedal Operated Multipurpose Machine

Submitted in partial fulfilment of the requirements

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Abstract

The objective of this project was to design and fabricate a pedal operated machine which could be utilized by small scale workshops and household operations for getting the maximum efficiency of human power dispensed. Accordingly, a pedal driven hacksaw and a pedal powered water pump/fluid pump were designed to meet the necessary requirements. The considerations made for fabrication included ready availability of raw materials for fabrication at remote places. The pedal powered hacksaw works on the principle of conversion of rotational energy into translational energy with the means of a slider crank mechanism. The pedal powered water pump operates on the principle of forcing of water into a closed chamber, which here used is a rotary vane pump's casing, to increase its pressure and allowing it to exit through an opening at higher pressure which is the Bernoulli's Principle. The experimental results showed that a higher efficiency rate is achieved and the demand is meet.

Keywords: Pedal Powered Hacksaw, Slider Crank Mechanism, Hacksaw, Rotary Vane Pump, Bernoulli's Principle.

Design and Fabrication of Profile Gas Cutting Machine

Submitted in partial fulfillment of the requirements

of the degree of

Bachelor of Engineering

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Mr. Vishal B. Dhumal	(M817)
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Guide Name:

Mr. Pradip P. Sharma

Abstract

To cut the various profile accurately, it is necessary to use gas cutter. In every industry to cut the profile of sheet metal, M.S. plate, etc. this gas cutter is used. For that we use mixture of oxygen and acetylene.

Manual cutting of profile with help of gas cutter is usually depending on skill of worker. Due to this accuracy of the entire process is affected. So instead of using a gas cutter, we can use profile gas cutting machine. Which can cut the profile accurately and as desirable. This machine can be used with any level of operator.

The main advantage of Profile gas cutting machine is reducing work time and to increase the accuracy at min cost of production. This machine is used to cut any profile early.

Keywords: Gas cutting operation, Profile gas cutting machine.

**Design & Fabrication Of Three Way Dumping Using
Single Hydraulic System**

Submitted in partial fulfillment of the requirements
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Bachelor of Engineering

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Abstract

'Three ways dropping dumper' has been conceived by observing the difficulty in unloading the materials. The survey in this regards in several automobile garages, revealed the facts that mostly some difficult methods were adopted in unloading the materials from the trailer. This paper has mainly focused on above difficulty. Hence a prototype of suitable arrangement has been designed. The vehicles can be unloaded from the trailer in three axes without application of any impact force. The direction control valve which activates the ram of the hydraulic cylinder which lifting the trailer in require side. Further modifications and working limitations will put this work in the main league of use. This concept saves time & energy which leads to efficient working.

In industrial and domestic considerations, Dumpers can pull a variety of products including gravel, grain, sand, compost, heavy rocks, etc. By considering wide scope of the topic, it is necessary to do study and research on the topic of Dumper mechanism in order to make it more economical and efficient. In existing system, Dumper can unload only in one side by using hydraulic jack or conveyor mechanism. By this research it is easy for the driver to unload the trailer and also it reduces time and fuel consumption

Keywords- Hydraulic jack, Hinge Joint, Three Way Tipper Mechanism, D.C. Motor, rack and pinion.

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