

## **Faulty Product Detection and Separation System**

All product manufacturing units need to have a faulty product detection and separation system in order to maintain product quality and maintain a good reputation. So here we demonstrate such a system using a mini conveyer belt system. We propose to design and fabricate a faulty product detection and separation mechanism. Each product is different and has a different mechanism. Here we detect a faulty product based on product size. We use a sensor to detect each product height as products move over the conveyer belt and separated by a conveyer arm. Here we use rollers and rubber belt to develop a mini conveyer belt mechanism. This mechanism is operated by a motor. We use an ultrasonic sensor to detect product height and products with less than a minimum height are detected as faulty products. This system uses a servo motor which has a separator arm.

## **Design and Fabrication of Advance Electromagnetic Braking System**

The project aims to create an electromagnetic braking system model capable of applying brakes without any friction loss and without losing the energy supplied. It uses a two electromagnetic which run by power of supply of circuit. Also there is a wheel which is attached to the motor so when the power is supplied by the help of motor the wheel rotates. Then a fan is attached near electromagnets to cool the electromagnets from excessive heating. A metal bar is in the vicinity of electromagnets and wheel so when the electromagnets produces eddy currents which stops the rotating wheel or rotor. This model helps in a way to be used retardation equipment in vehicles.

## **Application of Nano Technology in Domestic Refrigeration**

In past time only, refrigerants were used in refrigeration process and they were having a global warming coefficient at high level. Now a time change the modern techniques are coming into existence with the help of them the refrigeration process become more efficient and safer as compare to previous in atmospheric prospective. The project is based on nano technologies used in present time in refrigeration system like vapor compression refrigeration system, domestic refrigeration and air conditioner etc. The Nano refrigerant is nothing but the combined form of Nano particles with the refrigerant. The Nano refrigerant can be formed by two ways:

(1) By mixing Nano particles with refrigerant in gaseous form.

(2) By mixing Nano particles to lubricant.

We will do analysis of different Nano particles having the same diameter and same volume fraction with lubricant (from already published literature) to study the nature of thermo-physical properties in refrigeration process. There would be some parameters that can be studied from already published literature like energy consumption, heat transfer, cop etc.

## **Electric Car-The Modern Way of Commuting**

Electric-Drive Vehicles have gained attention especially in the context of growing concerns about global warming and energy security aspects associated with road transport. The main characteristics of EDVs are the torque is supplied to the wheels by an electric engine. This covers hybrid electric (HEVs), battery electric vehicles (BEVs) and fuel cell vehicles (FCVs). Electric vehicles are propelled by an electric motor (or motors) powered by rechargeable battery packs, instead of a gasoline engine. Electric cars are able to produce an approximate driving range of 100 miles before needing to be recharged and produce no tailpipe emissions. They also have substantially lower energy costs, while gasoline costs about 12 cents or more per mile driven, electric vehicles may have an energy cost as low as 2 cents per mile driven.

Electric cars are now on the road in very limited quantities. By taking gasoline out of the equation all together, many people assume the electric cars must be zero emission vehicles. While their tailpipe emissions are close to zero, we should remember that their source of power, electricity is generated by power plants.

## **Fabrication of an Innovative 3d Printing Machine**

3D Printing, also known as additive manufacturing (AM), is a process for creating a physical object from a three-dimensional digital model by laying down several sequential thin layers of a material. It is also known as rapid prototyping, is a mechanized method whereby 3D objects are quickly made on a reasonably sized machine connected to a computer containing blueprints for the object.

There are various different techniques to 3D print an object, each with their own set of advantages. Of these techniques, the most accessible and the most customizable technique is that of Fused Deposition Modelling (FDM), also known as Fused Filament Fabrication (FFF). Fused deposition modelling (FDM) is an additive manufacturing (AM) technology commonly used for modelling, prototyping, and production applications. FDM works on an "additive" principle by laying down material in layers; a plastic filament or metal wire is unwound from a coil and supplies material to produce a part. Thus, FDM is also known as a solid-based AM technology.

Herein we discuss how we built an FDM 3D printer, what its benefits are and how we can improve it in the future.

## **Design and Fabrication of VTOL Based Unmanned Aerial Vehicle**

Vertical Take-Off and Landing (VTOL) aircraft are able to take-off with the agility of a helicopter while retaining the efficiency and speed of an airplane during conventional flight. The applications of such an aircraft are vast, ranging from civilian transport to aeromedical evacuation and troop deployment. Currently such aircraft have been limited to military and research applications. The long range and efficiency associated with conventional aircraft means they can cover large distances and they can land where conventional aircraft often cannot. In these locations supplies can be deployed or surveillance obtained without the need for a sizeable landing area.

Similar benefits exist for scaled model Remote Controlled (RC) VTOL vehicles. Model aircraft enthusiasts are more often than not forced to fly their fixed wing aircraft in areas containing open and appropriate ground space necessary for take off and landing. However, a model RC VTOL aircraft would allow for launching from a roof top or an inadequate surface for conventional take off such as the beach. These needs and potential applications provide the motivation for this design project, in the anticipation of designing and building a model VTOL aircraft that is able to be controlled remotely and affordable to the everyday enthusiast.

## **Predicting Remaining Useful Life of a Mechanical Component – A Review**

The life prediction is crucial to guarantee the reliability and safety of the mechanical system. Components of rotating machines, such as shafts, bearings and gears are subject to performance degradation which if left unattended could lead to failure or breakdown of the whole system. The concept of Remaining Useful Life (RUL) is utilized to predict life-span of components with the purpose of minimizing catastrophic failure events. As customer demands for dynamically controlled systems it is necessary to have a continuous monitoring system which tracks, identifies trends and sources of component degradation prior to failure. The early warning capability seeks to detect, isolate and estimate the severity of faults based on fault propagation and detected degradation of a machine or a component to predict its RUL. Typically RUL is random and estimated from available sources of condition and health monitoring information. RUL of a device is also essential in remanufacturing engineering in the decision for parts to be taken out of service for remanufacturing. This review is centered on various methods of predicting RUL of a machine or a component. Some of the methods for predicting RUL are analyzed with the case studies such as Automotive Component, Rotating machinery, Aero engine etc.

## Prevention of Accident by Using Various Sensor Technology

At present situation the human beings are going through many accidents during the road way transportation. Simultaneously they lose their life and significant properties in those accidents. Most of the Indian roads in rural are not ideal for driving due to faded lanes, irregular potholes, inappropriate and unseen road signs, which caused many accidents, lost lives and caused serious damage to vehicles. A safe driving system of vehicle for drunk and driving cases, in this project we have used an **alcohol detecting sensor** in vehicle which senses and detects alcohol gases

Most road accidents occur due to careless driving of drivers because of drowsiness. This paper provides **Eye Blink Monitoring System (EBM)** that will alert the driver in drowsiness. A system for monitoring eye movements would be useful in warning drivers when they fall asleep. The driver's eye is continuously monitored using an **IR sensor**. The normal eye blink rate will have no effect on the output of the system. If Driver fell asleep, then IR sensor receives abnormal blinking rate & an alarm will ring, to wake him/her up. The sensor part of the EBM system is implemented as a goggle. This goggle is to be worn by the driver while driving the vehicle. Keywords: Vehicle, Eye Blink, Goggle, Infra-red, Op-amp, Microcontroller.

The one of the most difficult tasks is to detect **obstacles** on the highway. The basic concept is to design a system that has the effect of detecting the presence of an obstacle in the track of the vehicles.

## **Failure Mode Effect Analysis in Mosquito Propellant Manufacturing Unit**

The word 'maintenance' does not mean repairs but maintenance really means to keep up and not only to repair when it breaks down. It must be a regular and methodical process. The emphasis should be on maintenance rather than on repair. Machinery/equipment must be lined and levelled, wearing surfaces must be examined and replaced, and oiling schedules must be laid down at regular intervals. Thus, a machine in good operating condition subjected to regular inspection and adjustment will continue to produce quality products for a long time. Thus it can be said that maintenance is responsible for the smooth and efficient working of the industrial plant and helps in improving the productivity. It also helps in keeping the equipment's/ machines in a state of maximum efficiency with economy. Thus the development of a separate maintenance department is necessitated to look after the various allied activities. Maintenance may be considered a set of activities which help keep plant, machinery and other facilities in good working condition. According to Harold T. Amrine, John A Ritchey maintenance is —that function of manufacturing management that is concerned with the day to-day problem of keeping the physical plant in good operating condition.

It is an essential activity in every manufacturing establishment, because it is necessary to insure the availability of the machines, buildings and services needed by other parts of the organization for the performance of their functions at an optimum return on the investment, whether this investment is in machinery, materials or employees.

## **SHOPOV Methodology of Underground Cavities Detection System (UCDS)**

SHOPOV's aim was to create a new scientific knowledge by developing new innovative technology for remote detection of unknown underground cavities and deep-seated rockslides. To achieve the goal, SHOPOV intend to develop new innovative technology for remote localization of unknown underground cavities and deep-seated rockslides using a thermal camera mounted on a unmanned aerial vehicle (UAV). Technology is a defined sequence of operations and procedures under optimal conditions, varying within certain allowable limits, resulting in obtaining a particular result or product that meets certain requirements. Therefore, the development of new technology involved determining the allowable limits of deviation of the optimal conditions of operations and procedures for producing a good result that meets the established requirements. The development of new technology also involved determining the limits of its applicability under different external conditions. This report includes determination of the allowable limits and the limits of applicability of the new technology being developed by Shopov. Until now, no technology has been developed for remote detection of unknown underground cavities or deep-seated rockslides. The goal of this work was the development of such innovative technology with numerous applications in construction, environmental studies and protection, security, defense and infrastructure.

## **Fabrication of an Innovative 3d Printing Machine Based On Stereolithography (SLA)**

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## **Fabrication of an innovative 3D Printer based on Fused Deposition Modeling.**

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