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3	AI Lab with GPU based processors	CSE

Total No. of Publications	Department	No. of Publications
125	ECE	36
	EEE	12
	MECH	21
	CSE	47
	CE	5
	S&H	4

Total No. of Products	Department	No. of Products / Projects
39	ECE	21
	EEE	5
	MECH	13

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A Review Study On The Torch Positions In Pulse Mig Welding Process

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Abstract

This study is compiled from the various results obtained from the researchers on torch positions in pulse MIG welding process. The torch position plays a prominent role in deciding the weld quality and bead geometry in pulse welding process. Improper torch inclinations lead to porosity issues, inconsistent weld bead formation, improper fusion of metals, large amounts of spatter. Most of the above problems can be solved by choosing an optimum torch angle in pulse MIG welding. Therefore, it is very important to study various effects of torch inclinations to use it for the practical applications. This review study investigates the various effects of torch inclinations in pulse MIG welding.

Metal Inert Gas (MIG,) Porosity, Bead geometry, Spatter, Torch inclination or angle.

I. INTRODUCTION

Metal inert gas welding (MIG) process is an arc welding process suitable for both thin and thick components. The different arc transfer modes in MIG welding are

- Short-circuit transfer
- Globular transfer
- Spray transfer
- Pulse-spray Transfer (Pulse-MIG welding)

Short-circuit transfer, globular and spray transfer modes can all be run on conventional MIG welding power sources with the same wire. The difference in modes depends on the shielding gas, voltage and amperage being used. Pulsed MIG welding requires a welding power source that specifically has pulsed capabilities.

While spray transfer continuously propels drops of molten metal across the arc, in pulsed-spray transfer, this stream is not continuous. The welding power source rapidly switches the welding output between high peak currents and low background current. The peak current pinches off a spray-transfer droplet and propels it toward the weldment for good fusion. The background current maintains the arc, but it is too low for metal transfer to occur. Because the weld pool gets to cool slightly during the background cycle, it allows for welding in all positions on thin or thick metals.

Advantages of Pulse MIG welding:

- Reduces Spatter.
- Less Heat input.
- Ease of use.
- Directional control over weld pool.

Experimental Analysis of Heat Transfer rate on Plain and Biphillic Surfaces using Condensation methods

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Abstract

Condensation of vapour is needed in many of the Industrial applications like steam condensers, refrigeration etc. When vapour comes in contact with surface having temperature lower than saturation temperature, condensation occurs. When the condensate formed wets the surface, a film is formed over the surface and the condensation is called film wise condensation. When condensate does not wet the surface, drops are formed over the surface and condensation is called drop wise condensation. Surfaces with plain and low surface wettability lead to poor condensation process which means heat transfer rate and heat transfer coefficient is low. There are surfaces like Hydrophilic surfaces and hydrophobic pattern surfaces which help in increasing the heat transfer rate and heat transfer coefficient through material surface. By considering all the possible considerations we prepared a project which is used to find better surface for heat transfer through Biphillic surfaces by using condensation process.

Keywords: Condensation, Film Condensation, Plain Surface, Biphillic Surface, Teflon Coated Copper Tube, Teflon Coated Biphillic Copper Tube.

1. Introduction

Heat transfer is the study of the flow of heat. In chemical engineering, we have to know how to predict rates of heat transfer in a variety of process situations. For example, in mass transfer operations such as distillation, the overhead vapour has to be condensed to liquid product in a condenser, and the bottoms are boiled off into vapour in a reboiler. Often the feed stream is preheated using the bottoms product in a heat exchange. The three basic mechanisms of heat transfer. They are conduction, convection, and radiation. Conduction is an electronic/atomic mechanism of transferring energy from one place to another in solids, and a molecular mechanism of heat transfer in liquids and gases. Convection occurs when an element of fluid moves from one place to another, it brings its energy content with it, so that this is another mechanism for transferring energy from one place to another. Radiation heat transfer is ubiquitous, because all matter emits and absorbs electromagnetic radiation. The electromagnetic radiation spectrum is huge, but heat transfer is mostly concerned with a small part of it, called thermal radiation.

A Review Study On The Bev (Battery Electric Vehicles)

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Abstract

Electric Vehicles (EVs) are gaining momentum because of numerous factors, consisting of the charge discount in addition to the weather and environmental awareness. This paper evaluates the advances of EVs concerning battery generation trends. More specifically, an evaluation of the global marketplace scenario of EVs and their destiny potentialities is carried out. Given that one of the essential elements in EVs is the battery, the paper provides an intensive assessment of the battery technology from the Lead-acid batteries to the Lithium-ion. Moreover, in addition to the strength manipulate and battery electricity control proposals. Finally, we finish our paintings via way of means of supplying our imaginative and prescient approximately what's predicted withinside the close to destiny inside this field, in addition to the studies elements which can be nonetheless open for each enterprise and educational communities.

INTRODUCTION:

The automobile enterprise has turn out to be one of the maximum essential world-huge industries, now no longer most effective at financial level, however additionally in phrases of studies and development. Increasingly, there are extra technological factors which are being added at the cars closer to the development of each passenger and pedestrians' safety. In addition, there's a more range of cars at the roads, which lets in for us to transport fast and comfortably. However, this has brought about a dramatic growth in air pollutants degrees in city environments (i.e., pollutants, including nitrogen oxides (NOX), CO, Sulphur dioxide (SO₂), etc.). In addition, and in step with a file via way of means of the European Union, the delivery area is answerable for almost 28% of the overall carbon dioxide (CO₂) emissions, at the same time as the street delivery is responsible for over 70% of the delivery area emissions.[1] Therefore, the government of maximum advanced international locations are encouraging the usage of Electric Vehicles (EVs) to keep away from the awareness of air pollutants, CO₂, in addition to different greenhouse gases. More specifically, they sell sustainable and green mobility thru exceptional initiatives, in particular thru tax incentives, buy aids, or different unique measures, including unfastened public parking or the unfastened use of motorways. EVs provide the subsequent benefits over conventional cars.

- **Zero emissions:** This form of automobiles neither emit tailpipe pollutants, CO₂, nor nitrogen dioxide (NO₂). Also, the manufacture procedures have a tendency to be extra respectful with the environment, despite the fact that battery production adversely influences carbon footprint.
- **Simplicity:** The range of Electric Vehicle (EV) engine factors is smaller, which results in a far inexpensive maintenance. The engines are easier and extra compact, they do now no longer want a cooling circuit, and nor is vital for incorporating gearshift, clutch, or factors that lessen the engine noise.

Beach Pollution: A Review

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Abstract

Outcome of this mammoth problem is the rising socio-economic cost of poor water quality. Almost 40 million litres of wastewater enters rivers and other water biodiversity day with a very small fraction of it being adequately treated. Due to the polluted stretches in India the agricultural revenues decreases to 9% and also a 16% fall in agricultural yields downstream areas. Some remedial measures should be adopted to protect the poor masses of the country. Water pollution near oceans, rivers, lakes should be considered. It is the dire need of the hour to control water pollution to achieve the vision of the 'healthy nation trolled. Other types of oceanic pollution such as oil spills and radioactive and industrial waste, pollution due to festivals are just as costly and can contaminate the oceans for thousands of years to come. . If we humans do not curtail our way of living as a token of respect towards oceans, the damage will be irreversible thus causing permanent damages to the environment.

Keywords: marine pollution, plastic debris, oil spills, factory outlets.

1.INTRODUCTION

Together with communities, private and public sectors, NGOs, and artists groups, One Drop's projects will soon have improved the living conditions of more than 2.7 million people worldwide. Water has the power to transform people's lives, by reducing health risks in their living conditions, and by broadening economic opportunities for vulnerable communities.

January 25, 2018 - Mr. Douglas Woodring, Founder and Managing Director of Ocean Recovery Alliance, has been awarded 2018 Prince's Prize for Innovative Philanthropy by H.S.H. Prince Albert II of Monaco. The winner of the 2019 award was given to Mr. Paul Polman for his instrumental work as CEO of Unilever and the significant engagement he created in their quest for sustainability.

Ocean Recovery Alliance focuses on bringing together new ways of thinking, technologies, creativity, collaboration, and initiatives to help improve the ocean environment.

have built up in water to the extent of causing problems to people, animals and Water pollution is the contamination of water in water bodies such as rivers, oceans, lakes and swamps. This means that one or more substances plants.

1.1 Community waste water: include discharges from houses, commercial and industrial establishments connected to public sewerage system. The sewage contains human and animal excreta, food residues, cleaning agents, detergents and other wastes.

1.2 Industrial Wastes: The industries discharge several inorganic and organic pollutants, which may prove highly toxic living beings.

1.3 Agricultural sources.

Design And Analysis Of Cold Plate For Satellite Applications

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Abstract

This project aims understanding the cooling and effective thermal design methodology for electric equipment and applying these concepts to a real problem. The objective thermal design is to extract heat generated from the electronic equipment, to uncover potential risk areas for the System and to maintain the desired temperature levels. Effective thermal design is a blend of theoretical and simulation techniques aiming at optimized cooling solution for the component. The initial stage, design using theoretical design principle and then checking the accuracy with simulation techniques available. Detailed analysis will provide better degree of accuracy and in turn risk will be reduced systematically. A cold plate is considered as the cooling solution of a constant heat flux producing electronic system and the complete cooling system design is presented. Finally, the design is evaluated to check whether the electronic components are working under the safe conditions or not. This study predicts thermal performance of cold plate by theoretical and numerical approaches.

Keywords: Liquid Cooling, Cold Plates, Temperature, Heat Transfer, Electronic Applications.

1. Introduction:

In the past, the thermal designer's role was seen as one of predicting temperatures and ensuring that reliability limits are met for products. The packaging and thermal management of electronic equipment has become pivotal because of increased power levels and the simultaneous miniaturization of the devices. The ultimate goal of system thermal design is not the prediction of component temperature, but rather the reduction of thermally associated risk to the product. Heat is generated by the flow of electrical current in electronic component, these electronics components are observed to fail under prolonged use at high temperatures. Possible causes of failure are diffusion in semiconductor material, chemical reaction, and creep in bonding material. The failure rate of electronics device increases almost exponentially with operating temperature. Therefore, for safe working of electronic components the generated heat should be removed by using cooling methods [1].

The manufacturer of electronic devices specifies the rate of heat dissipation and maximum allowable component temperature for reliable operation. For low-cost electronic equipment, inexpensive cooling mechanism such as natural or forced convection with air as cooling medium is commonly used. for high performance electronic equipment, it is often necessary to resort to expensive and complicated cooling techniques such as liquid cooling systems. Design of a liquid-cooling system requires sizing of individual components so that the desired flow is delivered to the cold plates and type of cooling liquid, method of manufacturing, cost effective solution. The individual cold plates and heat sinks also need to be designed so as to achieve effective and uniform cooling over the entire surface. Both distributed flow cold plate and tubed flow cold plate are selected to compare the results between them. The studies on the performance and design of the cooling system are very limited in open literature. Most analyses have been executed by using A two-dimensional method without considering the variation of heat flux [2].

Selection of cold plate material:

REVIEW ON CONFIGURATION OF POWER SPLIT HYBRID ELECTRIC VEHICLES

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Abstract

The hybrid powertrain is one of the most important technologies that have been developed to satisfy the challenging of fuel economy and emission standards. As is well known, a suitable configuration should not only meet the requirements of vehicle kinematics and dynamics, but also meet the requirement of fuel economy and emission. paper reviews the advances of EVs regarding battery technology trends. More specifically, an analysis of the worldwide market situation of EVs and their future prospects is carried out. In this paper, the hybrid powertrain system is regarded as a system with multiple power sources. Moreover, as well as the power control and battery energy management proposals

INTRODUCTION

The automotive industry has become one of the most important world-wide industries, not only at economic level, but also in terms of research and development. With the increase of environmental and economic interests, improving fuel economy of vehicles has becomes an important topic in recent years.

Increasingly, there are more technological elements that are being introduced on the vehicles towards the improvement of both passengers and pedestrians' safety. As well known, a hybrid electric vehicle adds an additional power source (e.g., battery, etc.) and one or multiple actuators (electric machines) to the conventional power-train. The additional power devices help to improve system efficiency and fuel economy by engine right-sizing, load leveling, regenerative braking and pure electric mode. In general, hybrid electric vehicles can be crudely divided into three types: parallel, series and split. Among all three types, the power-split type has dominant market share [1].

This is mainly because the engine in the power-split HV is decoupled from the vehicle speeds and can operate efficiently while much of the power flows in the mechanical path. The study of possible HEV configurations is of interest both industry and academia. For example, Ford and Nissan are licensing the THS technology from Toyota while Chrysler and BMW are licensing the GM dual-mode technology

Hybrid electric vehicle have different configurations with different numbers of operating modes; for example, the Prius has no clutch and has a single operating mode, whereas the Chevy Volt uses three clutches and has four modes. It should be noted that the multiple operating modes can be achieved when clutches are augmented to a power-split configuration [4]

With the introduction of clutches, the complexity of hybrid powertrains becomes unprecedented. The high system complexity provides more freedom for achieving better fuel economy, performance, cost, and comfort [5].

Degree of freedom

The transmission of hybrid electric vehicle is a multi-input and multi-output system and can be considered to be a system including inputs, outputs and a function of transmit, so it may be analyzed by means of block diagrams as shown in Fig.1.



Design and Fabrication of Multipurpose Rugged Cutting Machine for Agriculture

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ABSTRACT:

As agriculture is one of the main occupations in India, it is very essential to discover and implement new ideas in this field, although a lot of work has been done in this area. It is a pity that these ideas are not properly implemented in the real field. This is due to the high cost and difficult for the rural population. Multi-purpose agricultural cutting equipment is the basic and main equipment involved in agriculture for maximum performance. The conventional method of planting and growing crops is a laborious process, and therefore there is a shortage of manpower, resulting in a delay in agriculture to overcome these difficulties. Multi-purpose agricultural equipment is designed. Agriculture plays a vital role in the Indian economy. Over 70% of rural households depend on agriculture. Agriculture is an important sector of the Indian economy, contributing approximately 8.4% to the total GDP and providing employment for over 60% of the population. Indian agriculture has experienced impressive growth over the past few decades.

KEYWORDS — *Agriculture, cutting equipment*

1. INTRODUCTION

Agriculture is one of the most significant sectors of the Indian Economy. Agriculture is the only means of living for almost two thirds of the workers in India. The agriculture sector of India has occupied 43% of India's geographical area, and is contributing 16.1% of India's GDP. In India agriculture has been facing serious challenges like scarcity of agricultural labour, not only in peak working seasons but also in normal time. This is mainly for increased non-farm job opportunities having higher wage, migration of labour force to cities and low status of agricultural labours in the society. On the other hand cultivable land is decreasing due to urbanization. Agricultural mechanization is one way to overcome this problem. Fortunately, there are many opportunities to move forward with agricultural mechanize

1.1 Sugarcane

India is one of the largest sugarcane producers in the world, producing around 300 million tons of cane per annum. For plantation of sugarcane, the sugarcane seed has to be planted in wet soil. This sugarcane seed is nothing but part of sugarcane. Sugarcane has approximately 15-18 seeds. In traditional way farmers use to cut whole sugarcane in 5-6 parts, in such a way that each part having 2-3 seeds. Then those cut parts are planted in soil. About 4 million sugarcane farmers and a large number of agricultural labours are involved in sugarcane cultivation and auxiliary activities, constituting 7.5% of the rural labour force.

1.2 Straw

Straw is remaining part of Jowar and Maize plant, after removal of corn part. Farmer use to cut this straw and use this cut parts as a food for pet animals like buffalos, cows, ox and goat etc. Initially this straw is of around 150-200 cm. And this should be cut into small pieces.

1.3 Groundnut

Groundnut is one of the important agriculture products in India. Farmer use to separate groundnuts from its plants by manually. This require more man power as 20-30 labours per acre, and also this is time consuming operation. A single groundnut plant contains 20 to 30 groundnuts.

Specification groundnut on average basis as below,

Length of groundnut root = 30 mm

Length of groundnut = 20 mm



Design and Analysis of Turbo Jet Engine

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ABSTRACT

This project aims to design a turbojet engine using Catia software. The design was based on the research conducted by industry experts and researchers throughout the history of jet engines. The design methods were carefully selected to simplify the engine design process. The objective of the project was to create a functional turbojet engine. Air travel has become more accessible in today's world, allowing people to travel to any part of the world in a short amount of time. However, the aviation industry was not as advanced in the past, using Rotary Piston IC engines that had limited travel speed and distance, high fuel consumption, and increased transport costs. The development of turbojet engines, which are Rotary-Reaction Turbine Engines, was a significant breakthrough in the aviation industry. Compared to Rotary piston engines, turbojet engines are more efficient, and other engines such as turbofan, turboprop, and turbo shaft engines were developed as improvements over the turbojet engine.

Keywords: Turbo jet engine, Modelling, Analysis, probabilistic technique, simulation.

1. Introduction

Jet engines are widely used in various applications, including aviation and energy production. The design and construction of a jet engine require knowledge from multiple fields, including thermodynamics, fluid mechanics, and mechanical engineering. To build a modern jet engine, experienced professionals from all these fields are necessary. A modern jet engine is an engineering marvel, with features such as fine tolerances in space, resilience to high temperatures and stress. Over the years, the jet engine has undergone significant improvements in performance, efficiency, and reliability. The most commonly known jet engines are the turbojet engine, turboprop engine, turbofan engine, turboshaft engine, and ramjet engine. The basic principles underlying these engines are the same, and they operate according to similar concepts as the internal combustion engine: suck, squeeze, bang, and blow. The first part focuses on the inlet, where air is sucked in. The second part involves compressing the air to a higher pressure. The third part is the combustion chamber, where the compressed air is mixed with fuel and ignited to create high-velocity exhaust gases. The fourth part focuses on the outlet of the engine, where the exhaust gases exit the engine.

The history of the turbofan engine should be included in the beginning of the thesis, which dates back to the Wright Brothers and their aircraft. The Wright Brothers designed, built, and flew "The Flyer" in Carolina, which marked the beginning of powered flight. The 12-hp reciprocating intermittent combustion engine gave life to The Flyer, and until the late 1930s, this type of engine was used in all manned aircraft. The history of aircraft gas engines started in January 1930 with Frank Whittle's development of the turbojet engine based on the Brayton cycle. In 1936, a new turbojet engine was developed by von Ohain in Germany, which was the first engine to fly. In modern times, the development of gas turbine engines is still ongoing. The early turbojets were used as propulsion systems for high-speed fighter and reconnaissance aircraft. The turbojet was more suitable for these applications than traditional propeller engines, but fuel economy, reliability, and endurance were not characteristics of the turbojet. The first developments were about pressure ratios. By the early 1950s, the turbojets achieved a 10:1 pressure ratio, and by the 2000s, it had reached 40:1. The U.S. Air Force requested an engine capable of long-range subsonic speed operation, leading to the development of more efficient engines from the turbojet. The TF39 was the first turbofan engine made by General Electric under the leadership of Gerhard Neumann in 1965 for the Lockheed C5A.

The basic principle used in jet engines can be traced back to 150 BC, where the principle was used in the Aeolipile, a simple construction that uses a radial steam turbine. The steam exits through a nozzle, creating a spinning motion of a ball, according to Newton's third law. In 1791, John Barber filed a patent utilizing the same thermodynamic cycle as a jet engine, and the interest continued throughout the 1800s. However, it wasn't until Sir Frank Whittle of the Royal Air Force in the 1930s made the first patent for the jet engine and showed the possibilities through reliable energy conversion. He conducted the first static test in 1937. Two years later, in 1939, a German physicist named Hans von Ohain made the first jet-powered flight and demonstrated the possibilities of jet engines. The idea came about to improve the propeller-driven aircraft of the time, where the main problem was the speed of the aircraft. The aircraft of the time were closing in on the speed of sound, and sometimes getting too close, which would result in shockwaves being created, causing the propeller to shatter.

Design and Fabrication of Real Time Voice Operated Wheelchair cum Bed

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ABSTRACT

This project opens a new hope to the physically challenged people. Freedom of mobility is the dream for every patient especially in the case of people suffering from cases such as quadriplegics and multiple sclerosis. Although many types of mobility equipment are available for these type of patient there is no independent means of mobility device for these patients since they cannot drive a joystick or manual wheelchair. In order to aid these types of patients we are developing voice operated wheelchair cum bed. The movement of the wheelchair cum bed is controlled by the voice of the user through Android phone. This wheelchair can be driven to the preferred direction with minimum effort. The user requires only less training to use this wheelchair. Technically this wheelchair is integrated with a voice recognition module to identify the voice, a microcontroller which can be programmed other supporting hardware components and a motor driver L293D. The proposed microcontroller-based voice operated wheelchair cum bed would bring more convenience for the disabled people.

Keywords: Smart wheelchair cum bed, Arduino UNO, Bluetooth module HC-05, Android phone, Motor driver, Disabled and elderly people.

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I. INTRODUCTION

The need for automatic Wheelchair is especially present in care of immovable people (people with persistent vegetative state, paraplegia, stroke and spinal cord injuries), where the care requires a lot of time and manpower. This report is the result of a design and development of an automated multifunctional Wheelchair that would perform all functions present in today's Wheelchair (Wheelchair with adjustable portion of back rest and leg rest and also convert to bed to wheelchair and vice versa and also remote control with which we can provide all necessary movement) as well as new functions of appropriate Wheelchair sections (leg positions adjusting). It is expected that this new automatic Wheelchair would enable people's better medical care, and would greatly reduce time and manpower to the old-age home staff.

Health monitoring is essential to our daily lives. The use of various specialized sensors in hospitals has increased recently because of efforts to enhance patient outcomes and overall construction efficiency. Modern hospital beds serve more purposes than simply providing sleeping space for patients. To make the people who are bed ridden more comfortable and at ease. The voice-controlled wheelchair convertible bed that can be operated via voice commands is described in the proposed system along with its design and prototype development. The bed has unique characteristics that set it apart from other beds. Moreover, the bed may be transformed into a chair position using voice instructions. Therefore, this study proposes a wheelchair that may be operated by the user's simple vocal instructions and discusses the design and development of a voice controlled automatic wheelchair. What will happen if wheelchair starts moving with audio input like forward, backward, left and right? The disabled person can move anywhere he wants without the help of second person and independently. There will be no need to use hands for moving the wheelchair. We are trying to implement this concept through our project "Smart wheelchair".

The name itself indicates the meaning the wheelchair which is intelligent. This wheelchair takes commands from user and according to that it moves in required direction. The person who is unable to move chair by hands can move this wheelchair just by giving the commands. This is the boon for paralyzed people. Hence using this chair, the patient can go anywhere independently. This is economical and fully automated. Hence physically disabled people can use this wheelchair easily and live their life happily.



Design and Fabrication of Die Using CNC-Milling Machine

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ABSTRACT

Injection molding is considered to be one of the most prominent process for mass production of plastic products the object molded can be depend on the selection of proper mold and behavior of polymeric material in injection moulding process .The injection molding machine melts and plasticize the moulding material inside the heating cylinders and inject this into the mould to create the product . In this project the stool leg bush dye is designed and modeled for the required dimensions by using AUTO CAD NX Software .By using CNC milling simulator ,the dye simulation work is done using NC Program .The dye is manufactured by CNC milling machine .The stool leg bush is manufactured by injection moulding .This project presents a step by step guide on the use of reverse engineering in designing and manufacturing a dye for plastic injection moulding of a keychain.

KEYWORDS : Injection Moulding ,Polimeric Material ,AUTOCAD NX Software ,Stool Leg Bush ,Reverse Engineering.

INTRODUCTION

INJECTION MOULDING

The injection machine is a machine that melts plasticize the molding material inside the heating cylinder and inject this into the mold tool to create the molded product by solidifying inside it. The injection machine is constructed of a mold clamping device that plasticize and inject the molding material. There are several types in the injection machine, and the difference is made by how these devices are arranged , but time and look for the injection time when the weight of molded became a certain amount and stop changing.



Figure 1: Injection Moulding



Fabrication and Experimental Investigation of Compressed Air Engine

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ABSTRACT—

This study presents an experimental investigation of a piston engine driven by compressed air. The compressed air engine was a modified 100 cm³ internal combustion engine obtained from a motorcycle manufacturer. The experiments in this study used a test bench to examine the power performance and pressure/temperature variations of the compressed air engine at pressures ranging from 5 to 9 bar (absolute pressure). The engine was modified from a 4-stroke to a 2-stroke engine using a cam system driven by a crankshaft and the intake and exhaust valves have a small lift due to this modification. Similar situations occurred during the exhaust process, restricting the power output of the compressed air engine. The pressure and temperature variation of the air at engine inlet and outlet were recorded during the experiment. The outlet pressure increased from 1.5 bar at 500 rpm to 2.25 bar at 2000 rpm, showing the potential of recycling the compressed air energy by attaching additional cylinders (split-cycle engine). A temperature decrease (from room temperature to 17 °C) inside the cylinder was observed. It should be noted that pressures higher than that currently employed can result in lower temperatures and this can cause poor lubrication and sealing issues. The current design of a compressed air engine, which uses a conventional cam mechanism for intake and exhaust, has limited lift movement during operation, and has a restricted flow rate and power output. Fast valve actuation and a large lift are essential for improving the performance of the current compressed air engine. This study presents a power output examination with the pressure and temperature measurements of a piston type compressed air engine to be installed in compact vehicles as the main or auxiliary power system.

Keywords: *Compressed Air Engine, Power Performance, Indicated Power, Brake Power, Mechanical efficiency.*

I. INTRODUCTION

In the past few decades, energy conservation and carbon reduction have become very crucial issues worldwide. Scientists have been searching for solutions to reduce the extensive use of conventional internal combustion (IC) engines and/or reduce their carbon dioxide emissions. To find a replacement for conventional IC engines, researchers have studied several types of engines that use green energy to determine the feasibilities of installing these engines in motor vehicles. Examples include electric engines, natural gas engines, and hydrogen engines. Electric vehicles are the most common green energy alternative and have been developed and commercialized for decades. However, slow battery recharging and a heavy battery weight are critical issues for electric vehicles. Hydrogen engines and natural gas engines can be used in motor vehicles; however, the required tank size limits their applications. In recent years, high-pressure compressed air has been considered a green energy source for its advantage of zero carbon emissions and potential applications as a main or auxiliary power system in motor vehicles. The Air Driven Engine is a low-emission engine that runs on compressed air. In Air Driven Engine, the expansion of compressed air drives the pistons of an engine. An Air Driven Engine is a pneumatic actuator that expands compressed air to produce useful work. Because there is no combustion, there is no mixing of fuel and air. Adder, J. [1] in the past few decades, energy conservation and carbon reduction have become very crucial issues worldwide. Scientists have been searching for solutions to reduce the extensive use of conventional internal combustion (IC) engines and/or reduce their carbon dioxide emissions. To find a replacement for conventional IC engines, researchers have studied several types of engines that use green energy to determine the feasibilities of installing these engines in motor vehicles. Examples include electric engines, natural gas engines, and hydrogen engines. Papon, A.; Creutzig, F.; Schipper, L. [2] Electric vehicles are the most common green energy alternatives and have been developed and commercialized for decades. However, slow battery recharging and a heavy battery weight are critical issues for electric vehicles. Hydrogen engines and natural gas engines can be used in motor vehicles; however, the required tank size limits their applications. In recent years, high-pressure compressed air has been considered a green energy source for its advantage of zero carbon emissions and potential applications as a main or auxiliary power system in motor vehicles. Schechter, M [3] describes new thermodynamic cycles and associated vehicle



Design and Fabrication of Agricultural Smart Seeding and Spraying Robot

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ABSTRACT:

More than 60 percent of the population in India do agriculture as the primary sector occupation. At present, due to increase in shortage of labour, interest has raised for the development of the autonomous vehicles like robots in the agriculture field. A robot called "Design and Fabrication of Agricultural Smart Seeding and Spraying Robot" has been designed to minimize the labour of farmers in addition to increasing the speed and accuracy of the work. The Proposed system is designed with the multipurpose autonomous agricultural robotic vehicle which can be controlled through WIFI, for seeding and spraying water on soil is dependent on the height of the plants but not in free space, sow the seed in desired depth and provide required spacing between the seeds, detection of blockage of a seed. The project was tested on the field. The robot is successfully able to move in all the directions. And sensor position adjustment for monitoring temperature and moisture content in the soil are updated to WIFI Robot App continuously. In seed sowing unit the user is capable of measuring the volume of the seeds in all the bins and also selecting size of the seeds for sowing. The seed sowing is capable to sow the seeds to the desired depth of 4 cm for the seeds whose diameter is greater than 4mm with the spacing of 5 inches and a desired depth of 5 cm for the seeds whose diameter is less then 6mm with the spacing of 6 inches between the seeds. Pesticide spraying unit is capable of spraying pesticide only on the plant not in the free space with the maximum height of 4 feet.

KEYWORDS — *Agricultural smart and seeding, Spraying, Arduino Uno, WIFI Control.*

1. INTRODUCTION

A. SEEDING

The major occupation of the Indian rural people is agriculture and both men and women are equally involved in the process. Agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. It has to support almost 17% of world population from 2.3% of world geographical area and 4.2% of world water resources. The Seed Planter was an invention thought out in 1699. It was later built and used. He started off in law school and then later in his life studied agriculture. Jethro inherited land in Europe where he practiced his agricultural study. His seed planter successfully planted seeds in uniform although this was improved in 1782, Jethro Tull still takes credit for his extremely helpful invention. The present cropping intensity of 137% has registered an increase of only 26% since 1950-51. The net sown area is 142 Mha. The basic objective of sowing operation is to put the seed and fertilizer in rows at desired depth and spacing, cover the seeds with soil and provide proper compaction over the seed. A traditional method of seed sowing has many disadvantages. Different types of methods of seed sowing and fertilizer placement in the soil and developing a multifunctional seed sowing machine which can perform instantaneous operations. In order to save the farmers effort and his valuable time, it is important to develop the method which not only saves the time but also saves his efforts. Farmers face the problem of nonavailability of bullocks as well as tractors during the peak period of sowing. Hence, they are tempted to hire them at an increased cost. By making use of

automatic operated seed planter is that - it can be easily driven by a single person as well as it can be driven manually. Currently maximum process is done manually which is too much time consuming and require more manpower for large farm areas and the automatic machines available they having too much cost. For reducing manpower, safety and most importantly cost in working automatic seed planter following practices are adopted Simplicity of process. Reduce human efforts. Eliminate steps. Improved accuracy.

B. SPRAYING

Agriculture plays an essential position in the Indian financial system. For the rural population, agriculture is a vocation for their livelihood. All farmers use pesticides, including organic farmers. Whether from artificial or natural sources, insecticides are utilized by all farmers. The difference is organic farmers can best use insecticides from natural resources. But both synthetic and herbal insecticides have various stages of toxicity. Today solutions hugely rely upon heavy chemicals. A pesticide is a substance utilized for controlling, obviating, and ravaging pests. But when farmers spray the pest, it's far a

FABRICATION OF ABRASIVE JET MACHINE

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ABSTRACT

AJM has become a very useful method for micro machining. It has enormous number of distinct advantages over the other non-traditional cutting and drilling methods, that include high machining versatility and minimum stresses on the substrate. This abrasive jet machining project is used for drilling holes on brittle materials like glass. Holes can be created in brittle material and glass with the usage compressed air and abrasive particles. A compressor used is connected through high pressure pipe to the control valve. Control valve controls the air through pipes to the nozzle. A pressure gauge is attached to measure the pressure through the pipes. Pressure relief valve is also used which is attached between control valve and nozzle which performs the cleaning of air that passes to the mixing chamber. Mixing chamber is used mix clean air with the abrasive particle at a high pressure. The abrasive particle can be introduced from the upper inlet of the mixing chamber. A nozzle is connected to the end of the mixing chamber where discharge takes place. Nozzle has the function of increasing the velocity of high pressurized discharged air that is mixed with the abrasive particle. This discharged air is impacted on the material which is held by the vice. Thus, the desired hole is obtained. For increasing the metal removal rate we are trying to decrease the size of the nozzle by regulating the pressure with respect to the material.

KEYWORDS: Micro machining, compressed air, abrasive particles, pressure gauge, control valves, mixing chamber .

I. INTRODUCTION**ABRASIVE JET MACHINING PRINCIPLE**

Abrasive Jet Machining (AJM) is the removal of material from a work piece by the application of a high speed stream of abrasive particles carried in gas medium from a nozzle. The AJM process is different from conventional sand blasting by the way that the abrasive is much finer and the process parameters and cutting action are both carefully regulated. The process is used chiefly to cut intricate shapes in hard and brittle materials which are sensitive to heat and have a tendency to chip easily. The process is also used for drilling, de-burring and cleaning operations. AJM is fundamentally free from chatter and vibration problems due to absence of physical tool. The cutting action is cool because the carrier gas itself serves as a coolant and takes away the heat.

EQUIPMENT

The main components being the compressor, air filter regulator, mixing chamber, nozzle and its holder, work holding devices and X-Y table. Air from the atmosphere is compressed by the compressor and is delivered to the mixing chamber via the filter and regulator. The mixing chamber contains the abrasive powders and is made to vibrate by an electric motor and cam arrangement. Then the abrasive particles are passed into a connecting hose leading to the nozzle. This abrasive and gas mixture emerges from the orifice of nozzle at high velocity. The feed rate of abrasive air is controlled by the amplitude of vibration of the mixing chamber. A pressure regulator installed in the system controls the gas flow and pressure. The nozzle is mounted on a plate which is screwed to the frame. The work piece is moved by moving the x-y table to control the size and shape of the cut. Dust removal equipment is necessary to protect the environment

IoT BASED TYRE PRESSURE MANAGEMENT SYSTEM

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1.INTRODUCTION

ABSTRACT : *The constant improvement of vehicle safety and lifespan has led to the development of tire monitoring and self-inflating systems. Maintaining proper tire pressure and temperature is crucial for vehicle safety and performance. A drop in tire pressure can result in reduced gas mileage, tire life, safety, and overall vehicle performance. To address this issue, we propose an automatic tire monitoring system utilizing the BMP180 sensor as an air pressure and temperature device, which communicates with the Arduino Uno microcontroller distributed by the Node MCU with a Wi-Fi module. The Blynk application displays real-time data on a smartphone using IoT technology. Our system aims to improve gas mileage, reduce tire wear, and increase tire handling and performance in various conditions. The system addresses the growing concern of environmental issues and the recent oil price hikes by promoting fuel efficiency. The proposed system is an innovative solution to address the shortcomings of traditional tire pressure monitoring methods, and the IoT-based system allows for remote monitoring and real-time data collection. Overall, our system aims to provide a reliable and efficient way of maintaining optimal tire pressure and temperature for safe and improved vehicle performance.*

KEYWORDS — air pressure, Arduino Uno, Blynk, temperature, TPMS.

The Internet of Things (IoT) has revolutionized the way we interact with technology, and it has also had a significant impact on the automotive industry. One area where IoT technology has had a particular impact is in the development of tire pressure monitoring systems. These systems use sensors to monitor the pressure of each tire in real-time, providing drivers with critical information about their vehicle's safety and performance. An IoT-based tire pressure monitoring system is designed to be highly efficient and accurate, providing drivers with real-time data on the condition of their tires. The system uses sensors that are installed in each tire to measure the air pressure and temperature of the tire. The data collected by the sensors is then transmitted wirelessly to a central hub, which can be accessed by the driver through a mobile app or dashboard display.

The benefits of an IoT-based tire pressure monitoring system are significant. Proper tire pressure is essential for safe driving, and a system that provides real-time data can help drivers stay informed and make the necessary adjustments quickly. The system can also improve fuel efficiency, extend the life of tires, and reduce the risk of accidents caused by tire failure. In summary, an IoT-based tire pressure monitoring system is a game-changer for the automotive industry. By providing real-time data on tire pressure and temperature, the system can significantly improve vehicle safety, performance, and efficiency. With the continued growth of IoT technology, we can expect to see further innovations in this field in the years to come.

2.LITERATURE REVIEW

Literature review was carried out throughout whole project to gain knowledge and skills needed to make this project. [1] The review suggests that a tyre pressure



Design and Fabrication of Beach Cleaning Vehicle

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ABSTRACT:

The goal of this project is to design and create a functional beach cleaning device that can be used to maintain beaches. The entire beach cleaning process is made possible by this machine. It lowers the expense and work required to maintain the beach. Our primary goal is to create a machine that is both practical and affordable. Our device's ability to fit properly in a car's trunk is another one of its key features. The entire device is green, and local suppliers are available for replacement parts. The inspiration for this idea came from reading a newspaper article about how poorly the government maintains our beaches. We conducted research on the subject and discovered it to be true. According to the officials, cleaning the beach as a whole is a time-consuming and expensive task. To remove trash from beaches, the majority of governments employ the time-tested pick-and-drop technique. This is time-consuming and ineffective. We have created a device that is intended to make beach cleaning practical. Both large and small scale operations can use this machine. This makes it possible for the smaller NGO with less money to have an impact. trash collection, trash sorting, and garbage disposal make up the machine's three main tasks. A conveyor belt with spokes that is attached collects the trash. The cutting- edge locking system can gather and sort the trash. In a box behind the machine, the trash is kept. AutoCAD is software is used to design the project.

I. INTRODUCTION

In the coastal regions of India, beaches are among the top tourist destinations. Additionally, they are the most polluted. The majority of governments neglected beach cleanup. The principal cause is because cleaning it is challenging. It consumes a lot of time and resources. The trash must be manually picked up by the employees. The waste is covered in sand when it is dumped in the sand by the strong coastal breezes. This makes it challenging to locate garbage. Cleaning is challenging for the staff because they must dig every cubic foot to gather the garbage. The labour conditions are worsened by the beaches' hot and muggy atmosphere. A few governments have purchased beach cleaning equipment. The primary disadvantage is that they are fairly pricey. and there are not many who can operate it. These machines break down far too frequently, necessitating the importation of spare parts. This prompts the government to stop using such devices. Due to their powerful fuel-based motors, these machines pollute the environment while cleaning the beaches. Thus, the goal of minimising pollution is defeated in its entirety. One sort of pollution is being transformed into another. A practical beach cleaning device that is inexpensive and simple to use has been created by us. There is not a steep learning curve. The machine's components were all found locally, so finding replacement parts shouldn't be too difficult. The machine can be powered by an electric motor or by people. Solar energy is used to power the electric motor. This provides a benefit over the current models on the market that are powered by fuel motors.

II. LITERATURE SURVEY

1. Kusoun Prakoobkam et. al, [1] analysed the waste generated on the beaches of Thailand. A large quantity of waste had to be collected and transported to the waste dumping area. The cost required was very high. Between January and October of that particular year itself the authorities encountered wastes on the sand of about 10 cubic meter per day. During the time of rain and wind storms the wastes such as plastic, young coconuts, etc are washed to the sea. Waste came along with the flow of water from Bangapakong river and came to the coastal area of the Saensuk municipality. The waste that came here have been trapped and collected with the installation of the waste trap buoy which is situated 5 km away from the coastline. This waste trap buoy that helps in preventing some garbage from getting to the beach. But now the waste trap buoy has been used for long and most of it is critically damaged. Because of all the above reasons the Saensuk municipality decided and had imported several beach trash collection trailers. But unfortunately no more they cannot be used it because of the unavailability of the necessary spare parts. This was because the spare parts that was to be replaced should be ordered from abroad. For instance, the belt conveyor was damaged or worn out due to the constant rubbing and mating out on the side of the trailer joint. This was because the coastline had a slope and it was not smooth and even. Saensuk municipality authorities used the loader i.e. tractor. The tractor is then attached to the rake to remove and collect waste on coastal area in the morning time. But the price that has to be paid is really high compared to the output. On based upon the following given reasons, the beach cleaning trailer was designed and then it had been manufactured in such a way that it will be suitable for various beach terrains and also the materials used in the trailer are locally available that to in cheaper rates. Especially, after the test and study it was also found out that almost all the ball bearings used in the trailer were regularly damaged or worn out, so to solve this issue the

Design and Fabrication of Library Management Robot

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ABSTRACT

The main objective of this project is to design a robot that handles library services effectively, develop a smart system to maintain a library using controller based system, reduce the load and the time consumption of human services, and ease and simplify the job of monitoring the library services and saving expenses by reducing human dependency. The robot performs multipurpose services and assistance for library users. It brings and returns books for students and records database. The robot interacts between students and library system.

Keywords: Monitoring, Multipurpose services, Reducing human effort, Database.

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I. INTRODUCTION

1.1.1 1.1 Project Definition

The goal of our project (An Autonomous Mobile Robotic Library System) is to design a smart human-robot interface, which will perform multipurpose services and assistance for library users; mainly bringing and returning books for students and other related services. The robot interacts between students and library systems.

1.1.2 LITERATURE REVIEW

Microcontroller based Robotic arm development for library management system .

Other people in different universities have done some previous similar projects. This definitely highlights the importance of having an autonomous robot within a workspace. For instance, the Department of Electrical Engineering Meghnad Saha Institute of Technology, Kolkata, India published an article concerning an autonomous robot, which could pick books and return books in different shelves within a library .

1.1.3 1.2 Project Objectives

- Design a robot that handles library services effectively.
- Develop a smart system to maintain a library using controller-based systems.
- Reduce the load and the time consumption of human services.
- Ease and simplify the job of monitoring the library services.
- Saving expenses by reducing human depend on the project architecture block diagram



Fabrication of Line Follower Robot

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ABSTRACT:

The robot is used to work without the requirements of human beings. The line follower robot is an autonomously working robot moves by following the path. The path is generally is painted or drawn on the floor visible on the surface or invisible line follower by using magnetic field. The robot senses the le on the surface by the optical sensors the optical sensing arrays helps the robot movements precisely to move on the line. The kinematics of robot Is important role in line follower robot for the movements by self-operating controlling system. The IR LED Lights which emit infrared rays are used to sense by reflection back of the infrared rays to the transmitter. The turnings and movements of the line follower robot is operated by the programming the Arduino board installed in the robot by the commands and the connections driving controls. The dc motor drives the movements to follow the line are operated by the integrated circuit micro-controller provides the control signal to drive the motors. The notification signals for the end of the tracing line by the piezo electrical buzzers. The applications of line follower robot are automated material handling, domestic purpose, automated carriers and transportation. The line follower robot is line tracing robot.

Keywords: *Optical IR Sensors, Line following, Arduino program controlling, integrated micro controller.*

1. Introduction

A Robot is any machine which is works automatically, i.e., it starts, decides its own way of work and stops on its own. It is actually similar to human being which has been designed to reduce human burden can be controlled mechanically, pneumatically or using hydraulic ways or using the simple electronic control ways The first industrial robot was Unimates but by George Devol and Joe Engel Berger in the lane 50's and early 60% Any robot in built on 3 basic laws defined by the Russian science fiction author Isaac Asimov they are

- A robot should not harm the human being directly or indirectly.
- A robot should obey human orders unless and until it violates the first law.
- A robot should protect its own existence provided the 1st two laws are not violated.

Line follower robot a line follower robot a robot which follows a certain path controlled by a feedback mechanism. These robots may be used to in various industrial and domestic purposes. Applications such as to carry goods, floor cleaning, delivery services and transportation. The line follower robot senses a black line by using a sensor and then sends the signal to Arduino. Then Arduino drives the motor with the motor driving sensor. without any external control and certain micro controllers according to sensors input. The two IR sensors in left and right. It is made up of an infrared LED and a phototransistor placed next to each other. The LED acts as a transmitter, and the phototransistor acts as a receiver. The project aims to create a line follower robot able to follow a path and reach its desired destination. Sensing the line robot while constantly correcting wrong moves using feedback from sensors forms a effective system. The line follower Robot can be controlled by with our without micro controllers, mobile based and radio frequency. Darker objects reflect less light, and are indicated by higher numbers. Lighter objects reflect more light, and are indicated by lower numbers and the robot can operated by the android applications by programming the Arduino component with software's in C++ software language.

Objectives: The robot must be capable of moving with following the line.

2. Literature review

Literature review was carried out throughout whole Project to gain knowledge and skills to make This project. [1] This Review suggests that robot does not need any remote controller or any controller Like Bluetooth, Wi-Fi, GSM, driver etc. it will run automatically with following a line. Working of line follower Robot without any Microcontroller.[2] This review suggests The line or path following robot can runs over a specific path with the help of sensors and specific logic used in the controller. Initially it will take some time for PCB designing, printing and hardware debugging.[3] We studied Surveillance systems using line control Robot fully functional prototype of a FLC-LFR Mobile surveillance camera monitoring is very important where it gives higher coverage region than an ordinary Surveillance.[4] In this review we learn about basic principles of electronics and the implementation



FABRICATION OF REAL TIME MULTI PURPOSE SOLAR BASED AIR CONDITIONING SYSTEM

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ABSTRACT : *The objective of this project work is to develop portable thermoelectric refrigeration system capable of maintaining vaccine temperatures between 8 °C and 13 °C. The main system consisted of thermoelectric module as cooling generator along with insulated cabin, battery and charging unit. Thermoelectric elements perform the same cooling function as Freon-based vapor compression or absorption refrigerators. To ensure the success of this project several criteria's are to be satisfied such as portability, size and cost of the system. The design of the preservation is based on the principles of thermoelectric module (i.e. Peltier effect) to create a hot side and a cold side. The cold side of the thermoelectric module is used for refrigeration purposes; provide cooling to the vaccine chamber. On the other hand, the heat from the hot side of the module is rejected to the surroundings with the help of heat sinks and fans. After gathering experimental data's and necessary guidelines from research papers on the thermoelectric refrigeration systems, the initial design of the model was made. Based*

on the heat load calculations, the thermoelectric module is selected. The system was fabricated and was experimentally tested for the cooling purpose.

1.INTRODUCTION

The conventional cooling systems are used now a days are requires the refrigerant whose phase change takes place in heat exchanging and compressor are required for the compression of the refrigerant. The compressor

required more power and space. The refrigerant is also not eco-friendly and increases the global warming and the major cause of ozone layer depletion.

The mini Eco-friendly refrigerator is based on the PELTIER EFFECT and a thermoelectric device called Peltier device is used for the cooling purpose. In the MEF-Refrigerator there is no need of compressor and refrigerant. Semiconductor solar based coolers (also known as Peltier coolers) off temperature control ($< \pm 0.1$ °C) can be achieved with Peltier coolers. However, their efficiency is low compared to conventional refrigerators. Thus, they are used in niche applications where their unique advantages outweigh their low efficiency. Although some large-scale applications have been considered (on submarines and surface vessels), Peltier coolers are generally used in applications where small size is needed and the cooling demands are not too great, such as for cooling electronic components. Conventional cooling systems such as those used in refrigerators utilize a compressor and a working fluid to transfer heat. Thermal energy is absorbed and released as The applications of thermoelectric coolers are increasing with an ever increasing demand of cooling in every sector for the past forty years. The TE coolers convert electrical energy into a temperature gradient which is also known as Peltier effect.

2.LITERATURE REVIEW

[1] in his thesis submitted on integration of a thermoelectric sub cooler in 2008. There are two general research areas



Fabrication of Motorized Tri E-Cycle

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ABSTRACT:

The first demonstration electric vehicles were made in 1830's and commercial vehicles were available By the end of the 19th century. Today's concerns about the environment particularly noise and exhaust Emissions, coupled to new developments in batteries, fuel cells, motors and controllers may swing the Balance of electric vehicles. There are many types of electric vehicles such as railway trains, ships, Aircrafts, cars, bikes, bicycles, wheel chair and many more. But in this project is focused on electrical Powered tricycle which is categorized under Low Speed Vehicles (LVSs) are an environmentally Friendly mode of transport for short trips. This paper details about the Electric Bike which runs on the Battery thereby providing voltage to the motor. This paper compromises with design and fabrication of Electric Bike which makes use of Electric energy. The major objective of the study was to design and Develop an electric tri-wheel cycle that would be used as a multipurpose transportation medium. The Project is developed to lessen the stress for people from all walks of life and circumstances. The project Developed is made up of locally available materials. The project can be used indoors and outdoors, since It is designed to lessen the stress of some people who walk a great length. It is especially useful in Indoor use, within the vicinity of a school, university, shopping and the like. It is intended for one rider Only. It also provided a cost- effective Approach to providing individualized transport systems in a wide variety of applications.

Application: - Warehouse management, individual transport, For daily commuting, Easily accessible transportation for Vulnerable persons.

1. INTRODUCTION

An e-cycle consists of a battery, motor, throttle and controller. And out of these parts, the battery and Motor are two of the most essential components of an electric scooter. When a rider twists the throttle

On the handlebar, the controller reacts by commanding the battery to send electric energy to the motor Which is mounted on the hub of the wheels. The motor uses this energy to rotate the gear which then Moves the wheels of the electric scooter forward. This electric cycle are powered by a DC gear motor. Well, instead of having one motor powering all The wheels through chains and gears, the motor is integrated directly into the wheel itself—so the Electric motor and the wheel are one and the same thing. When you push the throttle button on the Handlebar, the controller signals the battery to release energy to the motor to produce movement. The Handlebars will also come fitted with all controls, including the throttle button (on the right), brake lever (on the left), display settings, power buttons, etc

Energy crisis is one of the major concerns in today's world due to fast depleting resources of petrol, Diesel and natural gas. In combination with this, environmental decay is an additional factor which is Contributing to the depletion of resources which is an alarming notification. Our paper proposes the Solution for this above perilous problems. The system which we innovated is the Electric Bike. This Project has various benefits both to the members of the team and also external benefits thereby making Awareness of using alternative modes of transport. The Electric Bike which works on the battery that is Powered by the motor is the general mode of transport for a local trip. The solar panels can be alternative Source for this by adding it to the system. The Electric bike which will be running on battery, the power Is supplied by the motor, thereby supplying this power to drive the other gear components. The main Purpose of using this E-bike is that it is user friendly,economical and relatively cheap. The efficiency Of this system undeniable compared to conventional modes of transport.

Transportation in Vizag :

The transportation system in the city is highly influences by continues increasing population and Migration ratio. Two types of transportation systems are available in the Vizag city. The first option is Transport vehicles and the other one is Non-transport vehicles. Further Transport vehicles are being

2. LITERATURE REVIEW

Literature review was carried out throughout whole project to gain knowledge and skills needed to make this project.



Design and Analysis of Knockout Drum

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ABSTRACT :

Compressor suction knockout drum is one of type of pressure vessel and is used to remove liquid droplets carryover in gases to protect the downstream equipment. The knockout drum helps in improving performance of the compressor and by using this component in the compressor, corrosion of the compressor reduces. This paper deals with design, simulation, and fatigue life of compressor suction knockout drum. First the model is prepared using CATIA V5 software. Later, this model is used in ANSYS software to perform Static analysis, Thermal analysis.

Keywords: Knockout drum, Modelling, Analysis, probabilistic technique, simulation

1. Introduction

A Compression Suction Knockout Drum (CSKD) is one of the types of pressure vessel used as a real time component in many industries, such as chemical, petroleum, gas, oil, and oil refining industries. This is used to remove liquid droplet carrying over in gases through a mist pad which is fastened overhead the inlet valve/nozzle and beneath to the dish head. The feed to a vapour-liquid separator may also be a liquid that is being partially or totally flashed into vapour and liquid as it enters the separator [1]. Thus protect the downstream equipment, usually a reciprocating or centrifugal compressor. Most compressor suction knockout drums are arranged vertically. Gravity causes the liquid to settle to the bottom of the vessel, where it is withdrawn. The vapour travels upward at a design velocity which minimizes the entrainment (the process of making something part) of any liquid droplets in the vapour as it exits from the top of the vessel [2].

The most common forms of compression knockout drum in many technological applications are those subjected to internal pressure and external loads. Analytical & Numerical solutions of internal forces by cylindrical pressure vessel with semi elliptical head [3]. Stress analysis of cylindrical vessel with changeable head geometry ie: semi elliptical, hemispherical is analyzed if required to obtain contented outcomes-based application [4]. Elliptical head pressure vessel non radial & offset connections have non uniform distribution of stresses interaction region which decreases with the maximum effective stresses, as angle α increases for non-center connections [5]. The application of adequate stress-

relieving reinforcements is one of the challenges with compression knockout drum design. To ensure the safety of the pressure vessel, many types of connections are used. These connections include welded pad reinforcement, self-reinforced nozzles, and internally protruded connectors. A variety of studies have been conducted to examine pressure vessel safety under various loading situations due to the relevance of pressure vessels in engineering applications and the potential of safety concerns in the case of an accidents. There are a variety of codes that detail the rules and regulations that must be followed to ensure that equipment is constructed safely [6].

The performance of the suction knockout drum is analyzed in this study using simulation software "ANSYS" and the results are compared through analytical methods. The simulation model considers various operating conditions such as pressure, fluid properties and stress analysis to stimulate the loading conditions. These loading conditions effects the operating conditions on the separation efficiency and pressure drop in the drum. The results attained through the analysis furnish valuable insights of the performance of the compression knockout drum, which can be used to optimize its design and as well as its operation [8]. Additionally, the results can be used to enhance the overall efficiency, safety and as well the life time of compression knockout drum.

2. Literature Review

[1] Donald Mackenzie (Design by Analysis of Ductile Failure and Buckling in Tori-spherical Pressure Vessel Heads) (July to September -2008) The paper deals with study of torispherical pressure vessel head. This type of vessel exhibits complex elastic-plastic deformation and buckling behaviour under static pressure. Author has assessed both of these behaviour modes while specifying the allowable static load. By the direct route in EN code inelastic analysis is used. Plastic collapse or gross plastic deformation loads are evaluated for two sample torispherical heads by 2D and 3D FEA based on an elastic material model. Small and large deformation effects are considered in 2D analysis and the effect of geometry and load are considered in 3D analysis.



Automation of Home Appliances Using Bluetooth

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ABSTRACT:

Automation is a trending topic in the 21st century making it play an important role in our daily lives. The main attraction of any automated system is reducing human labour effort, time and errors due to human negligence. With the development of modern technology, smart phones have become a necessity for every person on this planet. Applications are being developed on android systems that are useful to us in various ways. Another upcoming technology is natural language processing which enables us to command and control things with our voice. Combining all of these, our paper presents a micro controller based voice controlled home automation system using smart phones. Such a system will enable users to have control over every appliance in his/her home with their voice. All that the user needs is an android smartphone, which is present in almost everybody's hand nowadays, and a control circuit. When the first computers came around, achieving the level of sophistication so as to narrate commands using voice to a machine was only realised in science fiction. However with tremendous breakthrough in the field, we are at the precipice of truly using voice to interface with devices.

KEYWORDS; Home Automation, Bluetooth, Android.

1. INTRODUCTION

The voice controlled smart home automation system helps to control electrical appliances by using voice commands. The system uses Bluetooth module for transmitting data for controlling functioning of electrical loads[2]. The Bluetooth can receive input signal from any a device which have Bluetooth compatibility such as smartphone. The smart home automation is most beneficial for handicap or aged people. The system solve the problem of switching on/off electrical appliances because when user just have to give voice command to control the appliance or electrical loads. The system is designed in such a way user can control all appliance at once or can control each separately. The system works by interfacing the on/off switches of electrical appliance or loads by using mechanical relay or solid state replay, after connecting relays in system the electrical switch works as two way switch. The voice command is sent by using a software designed for controlling the system, a built in microphone and voice recognition system implemented in device such as Samsung's Bixby. A micro-controller (Arduino Uno) is implemented in system [the micro controller receives input signal from user device and sent signal to respective relay for turning on/off electrical appliances connected with system such as bulbs, fan, air conditioner unit etc. The system works on 12V DC power which is converted from 220V AC power by using step-down transformer, rectifier for converting AC into DC and capacitive filter making fluctuating DC into pure DC power. This paper focus on the development of voice controlled based upon speech recognition system. The systems user interface device is a smartphone and software which interface with Arduino Uno to execute commands of user.

2. LITERATURE REVIEW

[1]. System consists of three main components; web server, which presents system core that controls, and monitors users' home and hardware interface module (Arduino PCB (ready-made), Wi-Fi shield PCB, 3 input alarms PCB, and 3 output actuators PCB), which provides appropriate interface to sensors and actuator of home automation system. The System is better from the scalability and flexibility point of view than the commercially available home automation systems. The User may use the same technology to login to the server web based application. If server is connected to the internet, so remote users can access server web based application through the internet using compatible web browser. The application has been developed based on the android system.

[2] An interface card has been developed to assure communication between the remote user, server, raspberry pi card and the home Appliances. The application has been installed on an android Smartphone, a web server, and a raspberry pi card to control the shutter of windows. Android application on a smartphone issue command to raspberry pi card. An interface card has been realized to update signals between the actuator sensors and the raspberry pi card. Cloud-based home appliance monitoring and controlling System. Design and implement a home gateway to collect metadata from home appliances and send to the cloud-based data server to store on HDFS (Hadoop Distributed File System), process them using MapReduce and use to provide a monitoring function to Remote user.

FABRICATION OF MOTORIZED TRI E-CYCLE

A Project report submitted in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING BY

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Project Guide

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EXTERNAL EXAMINER

ABSTRACT

The first demonstration electric vehicles were made in 1830's and commercial vehicles were available by the end of the 19th century. Today's concerns about the environment particularly noise and exhaust emissions, coupled to new developments in batteries, fuel cells, motors and controllers may swing the balance of electric vehicles. There are many types of electric vehicles such as railway trains, ships, aircrafts, cars, bikes, bicycles, wheel chair and many more. But in this project is focused on electrical powered tricycle which is categorized under Low Speed Vehicles (LVSS) are an environmentally friendly mode of transport for short trips. This paper details about the Electric Bike which runs on the battery thereby providing voltage to the motor. This paper compromises with design and fabrication of Electric Bike which makes use of Electric energy. The major objective of the study was to design and develop an electric tri-wheel cycle that would be used as a multi-purpose transportation medium. The project is developed to lessen the stress for people from all walks of life and circumstances. The project developed is made up of locally available materials. The project can be used indoors and outdoors, since it is designed to lessen the stress of some people who walk a great length. It is especially useful in indoor use, within the vicinity of a school, university, shopping and the like. It is intended for one rider only. The project functioned according to expectations, being a affordable and environment- friendly alternative as compared with its commercially available counterparts. It also provided a cost- effective approach to providing individualized transport systems in a wide variety of applications.

Keywords: Electric vehicles, Individual transportation, Vehicle simulation, Rechargeable Battery, Eco-friendly.

CHAPTER-6

CONCLUSION

The project deals with the design and fabrication of Electric cycle that promotes economical and eco-friendly means of transport for everyone. As the initial step, a literature survey on related systems and projects were conducted. A suitable design was proposed but due to infeasibility incurred in making the model, we decided to make a scaled-down prototype changing the design accordingly. The design dimensions and aspects were successfully calculated and analyzed. Materials and components for the fabrication of the project were compared and selected. The vehicle is used to reduce the manual effort i.e. in place of conventional cycle; and gives more displacement with lesser effort. This scooter has only three wheels, looks robust and lets you take it for a ride according to its design. Many systems can be improved in the future to optimize the manufacturing of the vehicle. Solar panels and Dynamo generators can be incorporated with the vehicle for charging while driving. Light weight carbon fiber can be used to reduce the overall weight of the vehicle and improves strength. This system can be efficiently used anywhere whether it is outdoor or indoor. This utilizes highly fuel-saving technology which is a major requirement of this era. We developed a branch and bound approach which is coupled with quick, effective bounds to optimize the Electric Scooter which serves the purpose of travelling and also use the non- renewable energy resources. On the whole, we are satisfied with our project.



DESIGN AND FABRICATION OF MULTIPURPOSE RUGGED CUTTING MACHINE FOR AGRICULTURE

*A Project Report submitted in partial fulfillment of the requirements for the
award of the degree of*

Bachelor of Technology
in
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This is to certify that the project report entitled "Design and Fabrication of Multipurpose Rugged Cutting Machine for Agriculture" by Mr. B. Sankara Rao (20NU5A0309), Mr. D. Paresh (19NU1A0308), Mr. A. Manoj Kumar (20NU5A0303), Mr. D.H.V. Manish Reddy (19NU1A0306) to the Nadimpalli Satyanarayana Raju Institute of Technology, in partial fulfillment of the requirements for the award of the Degree Bachelor of Technology in Department of Mechanical Engineering is a bonafide record of work carried out by him under my guidance and supervision. The contents of this report, in full or in parts, have not been submitted to any other Institute for the award of any Degree.



Project Guide

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ABSTRACT

As agriculture is one of the main occupations in India, it is very essential to discover and implement new ideas in this field, although a lot of work has been done in this area. It is a pity that these ideas are not properly implemented in the real field. This is due to the high cost and difficult for the rural population. Multi-purpose agricultural cutting equipment is the basic and main equipment involved in agriculture for maximum performance. The conventional method of planting and growing crops is a laborious process, and therefore there is a shortage of manpower, resulting in a delay in agriculture to overcome these difficulties. Multi-purpose agricultural equipment is designed. Agriculture plays a vital role in the Indian economy. Over 70% of rural households depend on agriculture. Agriculture is an important sector of the Indian economy, contributing approximately 8.4% to the total GDP and providing employment for over 60% of the population. Indian agriculture has experienced impressive growth over the past few decades.

6. CONCLUSION

The rugged multipurpose cutting machine combines four individual operations, reducing the need for manual labor and increasing efficiency. Our design focuses on minimizing costs and ensuring ease of operation for small farm units. By performing multiple operations, the machine saves processing time and reduces waste. For example, in sugarcane seed cutting, the machine allows for easy control of sugarcane wastage and produces cut seeds that are suitable for sowing. In groundnut stripping, two laborers can replace the work of 10-20 when using the machine. Similarly, in paddy stripping, the machine reduces wastage and can replace the work of 5-6 laborers with only two. Widespread adoption of this machine by farmers can alleviate the labor crisis and improve efficiency. The machine's ability to perform multiple operations with flexibility and a balanced mechanism represents a significant technological improvement in the agricultural sector and will motivate farmers to adopt it.

6. FUTURE SCOPE

Advanced sensors and microcontroller devices can be used to make this machine more comfortable for human operators while reducing costs. The potential for this machine in the future is vast. Currently, separate machines for individual operations are available in the market, but they are often expensive. It is possible to combine additional operations with the same machine, while some operations can still be done manually. By utilizing worm gears, the straw cutting operation can be automatically fed with straw. Furthermore, in addition to groundnut stripping, the same machine can be used to produce nuts with reduced cost and time.

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FABRICATION OF LIBRAIAN MANAGEMENT ROBOT
A Project Report Submitted In Partial Fulfillment Of The
Requirement For The Award Of
BACHELOR OF TECHNOLOGY IN MECHANICAL
ENGINEERING

By

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PROJECT GUIDE

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ABSTRACT

The main objective of this project is to design a robot that handles library services effectively, develop a smart system to maintain a library using controller based system, reduce the load and the time consumption of human services, and ease and simplify the job of monitoring the library services and saving expenses by reducing human dependency. The robot performs multipurpose services and assistance for library users. It brings and returns books for students and records database. The robot interacts between students and library system.

CONCLUSIONS

In this project the proposed system give the result of find thebook, Misplacing of the books can be identified easily. It reduces the manual work. With the proposed architecture, if constructed with at most accuracy, the robot will pick the book. It will act as a basic platform for the generation of more such devices for the book picking.This helps and simplifies the job of monitoring the arrangement of books and also reduces the manual routine. As development in Robotics is growing fast, we can make robot more autonomous and sophisticated .Also we can develop this system with real time camera implementation.



IoT BASED TRYE PRESSURE MANAGEMENT SYSTEM

A Project Report Submitted In Partial Fulfillment Of The Requirement
For The Award Of
BACHELOR OF TECHNOLOGY
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THIS IS CERTIFIED THAT THIS PROJECT ENTITLED
IoT BASED TYRE PRESSURE MONITORING SYSTEM

IS THE BONAFIDE WORK OF FINAL YEAR B.TECH WHICH HE HAS
SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENT FOR
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IoT BASED TYRE PRESSURE MANAGEMENT SYSTEM

ABSTRACT

The constant improvement of vehicle safety and lifespan has led to the development of tire monitoring and self-inflating systems. Maintaining proper tire pressure and temperature is crucial for vehicle safety and performance. A drop in tire pressure can result in reduced gas mileage, tire life, safety, and overall vehicle performance. To address this issue, we propose an automatic tire monitoring system utilizing the BMP180 sensor as an air pressure and temperature device, which communicates with the Arduino Uno microcontroller distributed by the Node MCU with a Wi-Fi module. The Blynk application displays real-time data on a smartphone using IoT technology. Our system aims to improve gas mileage, reduce tire wear, and increase tire handling and performance in various conditions. The system addresses the growing concern of environmental issues and the recent oil price hikes by promoting fuel efficiency. The proposed system is an innovative solution to address the shortcomings of traditional tire pressure monitoring methods, and the IoT-based system allows for remote monitoring and real-time data collection. Overall, our system aims to provide a reliable and efficient way of maintaining optimal tire pressure and temperature for safe and improved vehicle performance.

Keywords—air pressure, Arduino Uno, Blynk, temperature, TPMS.

CHAPTER 7

CONCLUSION

The dynamically-self-inflating tyre system would be capable of succeeding as a new product in the automotive supplier industry. It specifically addresses the needs of the consumers by maintaining appropriate tire pressure conditions for:

- Reduced tyre wear
- Increased fuel economy
- Increased overall vehicle s
- Safety

Because such a product does not currently exist for the majority of passenger vehicles, the market conditions would be favorable for the introduction of a self-inflating tire system.

Through extensive engineering analysis, it has also been determined that the self-inflating tire system would actually function as desired. In particular, the product would be capable of:

- Providing sufficient airflow to the tire with minimal leakage
- Withstanding the static and dynamic loading exerted on the rotary joints Note that likewise, this system would not produce any negative dynamic effects (such as CV joint failure due to resonance) on surrounding systems. Most significantly, the self-inflating tire system would be a successful product because of its economic benefits to investors.

Specifically, the final product would:

- Sell at about \$450/unit, with total first year profit and sales of nearly \$2.1 million and 8,000 units, respectively
- Experience 12% annual market growth each year for the first five years of the product, bringing total sales up to 370,000 units
- Break-even on the capital investment in just under three years For further development of this product, we recommend increasing the capability of the system by adding the following features:
 - Pressure adjustment based on increasing vehicle speed
 - Pressure adjustment based on increasing vehicle load



AUTOMATION OF HOME APPLIANCES USING BLUETOOTH

*A Project Report Submitted In Partial Fulfillment Of The Requirement For The
Award Of*

**BACHELOR OF TECHNOLOGY
IN
MECHANICAL ENGINEERING**
By

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, KAKINADA

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IS THE BONAFIDE WORK OF FINAL YEAR B-TECH WHICH HAS SUBMITTED IN PARTIAL FULFILLMENT FOR THE REQUIREMENT FOR THE AWARD OF BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING DURING THE ACADEMIC PERIOD OF 2019 -2023.

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AUTOMATION OF HOME APPLIANCES USING BLUETOOTH

Abstract

Automation is a trending topic in the 21st century making it play an important role in our daily lives. The main attraction of any automated system is reducing human labour effort, time and errors due to human negligence. With the development of modern technology, smart phones have become a necessity for every person on this planet. Applications are being developed on android systems that are useful to us in various ways. Another upcoming technology is natural language processing which enables us to command and control things with our voice. Combining all of these, our paper presents a micro controller based voice controlled home automation system using smart phones. Such a system will enable users to have control over every appliance in his/her home with their voice. All that the user needs is an android smartphone, which is present in almost everybody's hand nowadays, and a control circuit. When the first computers came around, achieving the level of sophistication so as to narrate commands using voice to a machine was only realised in science fiction. However with tremendous breakthrough in the field, we are at the precipice of truly using voice to interface with devices.

KEYWORDS : Home Automation, Bluetooth, Android.

CHAPTER – 08

CONCLUSION

The voice based home automation system would be capable of succeeding as a new product. It specifically addresses the needs of the consumers.

Flexibility: A Home automation system needs to adapt to different users and their requirements. It needs to be able to recognize voice commands from all users irrespective of their age, gender, accent and pitch. It must also be able to work with appliances the user already owns, so that he doesn't have to purchase additional appliances. The system must have multiple interfaces so that the user can choose whichever is most convenient to him. Interfaces can include a simple voice command interface, a mobile application to control devices.

Robustness: A home automation system needs to be robust i.e. it should work even under less than ideal conditions. The voice recognition module must be able to recognize commands even when the user is at a distance from the microphone. Ambient noise and background disturbances must have minimal impact on performance. Suppose the microphone is placed in a room where both, a noisy fan and a television are turned on and the user wishes to give a command. It wouldn't be viable to expect the user to mute the television every time he wants to give a command, therefore a good home automation system must take all these factors into consideration and find a way around them.

Security: Modern home automation are also used to lock and unlock the doors in a house. A system that is built from the ground up with emphasis on safety of the client is preferable. This metric will also consider systems that provide additional features like detection, smart alerts, secure locks, etc.

Cost: A major factor that decides how successful a home automation system is the cost the user has to incur. A system may have all the latest bells and whistles, but if the user cannot afford it he simply will not buy it. Cost includes but the initial cost of the product as well as the cost of installation and long term maintenance. An automation hub may appear to be cheap but when you consider the cost of all the additional appliances you need to buy along with the hub, the cost adds up. Also, if the system is wired, the cost of labour that is needed for installation needs to be kept in mind.

Response Time: Everyone today is used to instantaneous results, therefore in order for a home automation system to be truly useful it must respond to inputs in the shortest time possible. Some algorithms give superior results for command recognition but the time they take for computation is not ideal. An ideal algorithm would be one which strikes a perfect balance between computational power and response time.



IoT BASED TRYE PRESSURE MANAGEMENT SYSTEM

A Project Report Submitted In Partial Fulfillment Of The Requirement
For The Award Of
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CHAPTER 7

CONCLUSION

The dynamically-self-inflating tyre system would be capable of succeeding as a new product in the automotive supplier industry. It specifically addresses the needs of the consumers by maintaining appropriate tire pressure conditions for:

- Reduced tyre wear
- Increased fuel economy
- Increased overall vehicle s
- Safety

Because such a product does not currently exist for the majority of passenger vehicles, the market conditions would be favorable for the introduction of a self-inflating tire system.

Through extensive engineering analysis, it has also been determined that the self-inflating tire system would actually function as desired. In particular, the product would be capable of:

- Providing sufficient airflow to the tire with minimal leakage
- Withstanding the static and dynamic loading exerted on the rotary joints Note that likewise, this system would not produce any negative dynamic effects (such as CV joint failure due to resonance) on surrounding systems. Most significantly, the self-inflating tire system would be a successful product because of its economic benefits to investors.

Specifically, the final product would:

- Sell at about \$450/unit, with total first year profit and sales of nearly \$2.1 million and 8,000 units, respectively
- Experience 12% annual market growth each year for the first five years of the product, bringing total sales up to 370,000 units
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 - Pressure adjustment based on increasing vehicle speed
 - Pressure adjustment based on increasing vehicle load



DESIGN AND FABRICATION OF BEACH CLEANING VEHICLE

A Project report submitted in partial fulfilment of the requirements for award of the
degree of

BACHELOR OF TECHNOLOGY

IN

MECHANICAL ENGINEERING

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EXTERNAL EXAMINER

DESIGN AND FABRICATION OF BEACH CLEANING VEHICLE

ABSTRACT

This project is proposed to design and develop a working beach cleaning machine to clean the beaches. This machine enables the total work in cleaning the beaches. It reduces the cost and labor associated with cleaning the beach. Our main focus is on developing a machine in a pragmatic way which is both cheap and easy to use. One of the other major features of our machine is that it can fit perfectly in the boot of the car. The entire machine is eco-friendly and spare parts can be procured locally. The motivation for this project came after seeing a report in the newspaper reporting the poor maintenance of our beaches by the government. We made a study regarding the same and found it to be true. The authorities reported that the entire beach cleaning is a hectic and costly process. Most of the governments use the traditional pick and drop method to clear the waste from beaches. This is both ineffective and time consuming. We have designed a machine which is designed to make beach cleaning process feasible. This machine can be employed in large and small scale. This enables the smaller NGO with limited funding to make a difference. The machine consists of three main functions, i.e. waste collecting, waste sorting, waste disposal. The waste is collected by a conveyor belt which is attached with spokes. The advanced locking mechanism is able to collect and sort the waste. The waste is stored in a box behind the machine. AutoCAD was used to design the entire machine.

Keywords: Beach cleaning, conveyor system, Environment, Hooper

CHAPTER 9

CONCLUSIONS

9.2 CONCLUSION

From this study the following conclusion were drawn:

- Easy to use and effective equipment for beach cleaning
- Multipurpose equipment is designed and fabricated with low-cost
- Specially designed for beach cleaning.
- By providing a mechanism for the objective by renewable energy the environmental impact is nearly zero.
- The time it conserves in cleaning the beach will motivate the government and the NGO to adopt the machine.
- Avoiding human errors in picking and disposing the waste.
- It can be easily transported, thus the cost of transporting is less.
- Does not require fossil fuel so can be used in remote location.



Fig 8.1 : Assembled vehicle



DESIGN AND FABRICATION OF REAL TIME VOICE OPERATED WHEELCHAIR CUM BED

A Project report submitted in partial fulfillment of the requirements for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

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EXTERNAL EXAMINER

ABSTRACT

This project opens a new hope to the physically challenged people. Freedom of mobility is the dream for every patient especially in the case of people suffering from cases such as quadriplegics and multiple sclerosis. Although many types of mobility equipment are available for these type of patient there is no independent means of mobility device for these patients since they cannot drive a joystick or manual wheelchair. In order to aid these types of patients we are developing voice operated wheelchair. The movement of the wheelchair is controlled by the voice of the user. This wheelchair can be driven to the preferred direction with minimum effort. The user requires only less training to use this wheelchair. Technically this wheelchair is integrated with a voice recognition module to identify the voice, a microcontroller which can be programmed other supporting hardware components and a motor driver L293D. The proposed microcontroller-based voice operated wheelchair would bring more convenience for the disabled people. Two DC motors can be driven simultaneously, both in forward and reverse direction with the help of L293D motor driver. Here we can control the motors to move right, left, forward, reverse, free runs and stop or break. To provide tilt operation for this wheelchair we use selective movement of a single motor based on the diameter and speed of the wheel. Also, can calculate how much movement is required to tilt the wheelchair at a desired angle.

KEYWORDS: Smart wheelchair, Deception, Arduino UNO, Motor, Motor driver, Disabled and elderly people, Helper.

CHAPTER-5

1 CONCLUSION

In this survey paper we have analyzed many journal papers about existing methodologies related to our proposed system. Mostly, they are using mechanical technique which is done manually by a person which faces a lot of challenges in current health care industry. Hence we come up with a solution from this survey paper, we suggest combining both mechanical and electrical system to make it automated method for moving wheelchair on stretcher. It overcomes all of the demerits and provides a unique solution. This automated method is based on the principle of heart rate of the patients and works according to each and every heart rate. When abnormal heart beat prolongs over a certain period of time, the health care professionals can able to sense the condition of a patient using this automated method. Hence, this automated method is of low cost it is more affordable method for all health sectors. The automated wheelchair cum stretcher plays a vital role in future for all handicapped people in order to perform their daily activities. Thus, the proposed methodology is a novel technique which can create a revolution in health care set. Our product will eliminate the use of separate wheelchair and stretcher in the hospitals, so that we can eliminate the step of shifting patients from bed or stretcher to wheel chair and vice versa. The wheelchair will consume less space and is manufactured at low cost. The idea is to design a bed that can be relied upon to conduct voice orders so that it can be used in care facilities, homes, and hospitals. Below is a schematic diagram that shows how the designed system functions. There are seven distinct categories of instructions for moving the bed: rest, wake, sit, up, down, lift, and fall. Figure 2 represents the schematic diagram of the movement of the bed. The microphone picks up the user's voice orders and converts them into electrical impulses. The voice module receives electrical impulses and digitizes and stores them as templates to represent user commands. Initially, users voice must be trained to utilize the established system before that command is saved in the voice module.



FABRICATION OF COMPRESSED AIR ENGINE

A Project Report Submitted in Partial Fulfillment of The Requirement
for The Award of Degree of

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING

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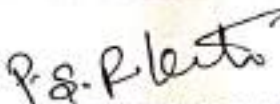
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EXTERNAL EXAMINER

ABSTRACT

This study presents an experimental investigation of a piston engine driven by compressed air. The compressed air engine was a modified 100 cm³ internal combustion engine obtained from a motorcycle manufacturer. The experiments in this study used a test bench to examine the power performance and pressure/temperature variations of the compressed air engine at pressures ranging from 5 to 9 bar (absolute pressure). The engine was modified from a 4-stroke to a 2-stroke engine using a cam system driven by a crankshaft and the intake and exhaust valves have a small lift due to this modification. Similar situations occurred during the exhaust process, restricting the power output of the compressed air engine. The pressure and temperature variation of the air at engine inlet and outlet were recorded during the experiment. The outlet pressure increased from 1.5 bar at 500 rpm to 2.25 bar at 2000 rpm, showing the potential of recycling the compressed air energy by attaching additional cylinders (split-cycle engine). A temperature decrease (from room temperature to 17 °C) inside the cylinder was observed. It should be noted that pressures higher than that currently employed can result in lower temperatures and this can cause poor lubrication and sealing issues. The current design of a compressed air engine, which uses a conventional cam mechanism for intake and exhaust, has limited lift movement during operation, and has a restricted flow rate and power output. Fast valve actuation and a large lift are essential for improving the performance of the current compressed air engine. This study presents a power output examination with the pressure and temperature measurements of a piston-type compressed air engine to be installed in compact vehicles as the main or auxiliary power system.

Keywords: compressed air engine; experimental investigation; power performance; pressure; temperature

CHAPTER-5

1. CONCLUSION

CAE was introduced, and thermodynamic characteristics and efficiency analysis were studied. To obtain the performances of CAE, a prototype of CAE was designed and adopted in test bench. The output power, torque and efficiency were obtained through experimental study. The conclusion is summarized as follows:

- 1) The performance of the CAE is mainly influenced by the rotation speed and supply pressure.
- 2) In the first instance, the output power ascends sharply with the increasing rotation speed and reaches to maximum value. After this peak, the output power drops sharply.
- 3) The prototype of CAE has a good economic performance under low speed.
- 4) When the supply pressure is 2 MPa, the maximum output power is 1.92 kW; the maximum output torque is 56.55 Nm.; and the maximum efficiency is 25%.

2. FUTURE SCOPES OF AIR DRIVEN ENGINE

1. Usage of compressed air tanks for storage and supply will give it more scope in automobiles. Air Driven Engine made of light metal will give better results.
2. Much like electrical vehicles, air powered vehicles would ultimately be powered through the electrical grid. This makes it easier to focus on reducing pollution from one source, as opposed to the millions of vehicles on the road.
3. Transportation of the fuel would not be required due to drawing power off the electrical grid. This presents significant cost benefits. Pollution created during fuel transportation would be eliminated.



A Project report on

**DESIGN AND FABRICATION OF AGRICULTURAL
SMART SEEDING AND SPRAYING ROBOT**

*submitted in partial fulfilment of the requirements for award of the
degree of*

**BACHELOR OF TECHNOLOGY
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EXTERNAL EXAMINER

DESIGN AND FABRICATION OF AGRICULTURAL SMART SEEDING AND SPRAYING ROBOT

ABSTRACT

More than 60 percent of the population in India do agriculture as the primary sector occupation. At present, due to increase in shortage of labour, interest has raised for the development of the autonomous vehicles like robots in the agriculture field. A robot called "Design and Fabrication of Agricultural Smart Seeding and Spraying Robot" has been designed to minimize the labour of farmers in addition to increasing the speed and accuracy of the work. The Proposed system is designed with the multipurpose autonomous agricultural robotic vehicle which can be controlled through WIFI, for seeding and spraying water on soil is dependent on the height of the plants but not in free space, sow the seed in desired depth and provide required spacing between the seeds, detection of blockage of a seed. The project was tested on the field. The robot is successfully able to move in all the directions. And sensor position adjustment for monitoring temperature and moisture content in the soil are updated to WIFI Robot App continuously. In seed sowing unit the user is capable of measuring the volume of the seeds in all the bins and also selecting size of the seeds for sowing. The seed sowing is capable to sow the seeds to the desired depth of 4 cm for the seeds whose diameter is greater than 4mm with the spacing of 5 inches and a desired depth of 5 cm for the seeds whose diameter is less then 6mm with the spacing of 6 inches between the seeds. Pesticide spraying unit is capable of spraying pesticide only on the plant not in the free space with the maximum height of 4 feet.

Keywords: Agricultural smart and seeding, Spraying, Arduino Uno, WIFI Control

CHAPTER-8

CONCLUSION AND FUTURE SCOPE

The WIFI Module controlled multifunctional smart Robot has been designed in such a way that it can cater to the needs of the bomb disposal squad, the military, the police and also for the personnel who handle radioactive materials.

It has countless applications and can be used in different environments and scenarios. For instance, at one place it can be used by the bomb disposal squad, while at another instance it can be used for handling mines. While another application can be to provide up to date information in a hostage situation.

One of the major advantages of this robot are,

- It can be altered to suit the needs of the user
- It is fast and robust.
- It can handle different loads.
- It can be controlled remotely.
- It has video feedback.
- It has its own power supply.
- It has a 3-degree of freedom robotic arm.

Future Scope:

Compact Design

A compact design results in a much faster motion and thus increases the accuracy and efficiency. Therefore the robot can be enhanced to be of much smaller size for the purpose of a faster and accurate operation. Compact design is also required where the situation demands the robot to reach for small places. For example, in the aftermath of an earth quake, the robot has to search for people trapped under the rubble. It has to enter holes where humans cannot enter. Hence a compact robot will easily do the job.

Quick Movement

Being a bomb disposal robot, it requires very fast movement. This is required as the bomb disposal squad have very little time in checking out the bomb and then defusing it. Therefore a fast robot is necessary to be successfully used as a Bomb Disposal Robot.

Improved Reliability

At the moment the turning mechanism of the robot is based on the stepper motor, which is not that accurate. Also the shoulder of the robotic arm or the base of the robotic arm also depends on the motion of DC motor, which is not very feasible.



**DESIGN AND FABRICATION OF DIE USING BY
CNC - MILLING MACHINE**

A Project report submitted in partial fulfillment of the requirements for the award of the degree of

**BACHELOR OF TECHNOLOGY
MECHANICAL ENGINEERING**

BY

20NU5A0311 - B. JAGADEESH SAI KUMAR
20NU5A0313 - B. SWAROOP
20NU5A0321 - D.CHARAN SAI
20NU5A0342 - K. CHANDRA KIRAN

Under the Esteemed Guidance of
Mr. KONA RAM PRASAD, M. Tech., (Ph.D)
ASSISTANT PROFESSOR



DEPARTMENT OF MECHANICAL ENGINEERING

NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY

(Affiliated to JNTUK, Kakinada, Approved by AICTE, New Delhi)

SONTYAM, VISAKHAPATNAM - 531173

2022-2023

NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY

(Affiliated to JNTUK, Kakinada, Approved by AICTE, New Delhi)

SONTYAM, VISAKHAPATNAM - 531173

DEPARTMENT OF MECHANICAL ENGINEERING



CERTIFICATE

This is to certify that the Project Work entitled "DESIGN AND FABRICATION OF DIE BY USING CNC - MILLING MACHINE" that is being submitted by, B.JAGADEESH SAI KUMAR (20NU5A0311), B.SWAROOP (20NU5A0313), D.CHARAN SAI (20NU5A0321), K.CHANDRAKIRAN (20NU5A0342), for the fulfillment of the requirements for the award of the degree of **BACHELOR OF TECHNOLOGY** in **MECHANICAL ENGINEERING** to Jawaharlal Nehru Technological University –Kakinada is a record of Bonafide work carried out by them under my guidance and supervision.

K. Kona Prasad
Project Guide

Mr. KONA RAM PRASAD, M.Tech., (Ph.D)
ASSISTANT PROFESSOR

N. Naveen
Head of the Department
Head of the Department
Dr. P.N.E. NAVEEN, Ph.D.
Mechanical Engineering
Nadimpalli Satyanarayana Raju Institute of Technology (V)
ASSOCIATE PROFESSOR & HOD
Visakhapatnam-531173

[Signature]
EXTERNAL EXAMINER

ABSTRACT

Injection molding is considered to be one of the most prominent process for mass production of plastic products the object molded can be depend on the selection of proper mold and behavior of polymeric material in injection moulding process. The injection molding machine melts and plasticize the moulding material inside the heating cylinders and inject this into the mould to create the product . In this project the stool leg bush dye is designed and modeled for the required dimensions by using AUTOCAD NX Software .By using CNC milling simulator ,the dye simulation work is done using NC Program .The dye is manufactured by CNC milling machine. The stool leg bush is manufactured by injection moulding .This project presents a step by step guide on the use of reverse engineering in designing and manufacturing a dye for plastic injection moulding of a keychain.

KEYWORDS : Injection Moulding , Polumeric Material , AUTO CAD NX Software , Stool Leg Bush , Reverse Engineering

CHAPTER -5

CONCLUSION

Hence, we have successfully designed and manufactured a plastic injection molding die to produce plastic key chains with the help of reverse engineering approach. We could also establish a stable relationship between reverse engineering and rapid prototyping processes with a few more adjustments and process enhancements. We can also conclude from this research that manufacturing of a plastic injection molding die is possible by using reverse engineering approach. More accurate dimensions of the die could be obtained by using Laser Scanning instead of CNC.

In this project we performed design of the mould die for injection molding in the AUTO CAD , and then performed the operation on the CNC machine to develop the die cavity on the raw material. the design of CNC machine structure, the machine capacity i.e. speed of spindle, workspace of travel of tool post etc. must be considered in design. Also the different forces imparted on machine tool member required to analyze for each member for designing



Report
On
PROJECT SHOW CASE
14th March 2023.

With reference to the circular from Principal, a pedagogy learning methodology program in the name of 'Project Show Case' was conducted on March 16th, 2023, Saturday in NSRIT College campus. This program was inaugurated at 02 PM by the Chief Guest **Dr.S.Subbarama Koushik** , NIT-Puducherry and **Dr.J.Murugudoss**, Director, NSRIT participated as honorable guests. The program was initiated with Guest Lecture. All the Heads of the departments are also participated in inauguration process.

The main objective of the program is to expose the creativity of the students in their academic projects to outside the society. This exhibition provides an opportunity for upcoming developer to exhibit their skills through their creations. Project Show Case 2023 presents an opportunity for all Final year talented students to show their innovative projects. This project exhibition is the ideal platform for audience to feel the pulse of the students and empower the students in the field of innovation and technology. Project Show Case 2023 aims at initiating interest in entrepreneurial activities and encouraging young innovators to register for patents. All the Heads of the Department, faculties, academic administrators of ME Department are participated in the program

S.No.	Department Name	Name of the faculty	Event - Location	Visited Time	Number of		
					Batches	Projects	Students
1	Mechanical Engineering (ME)	Dr.PN.E.Naveen,HOD Mrs.B.Usha Rani, Project Coordinator	Block - 2	02.00 PM to 03.30 PM	12	7	55A)
		Mr.Ch.V.V.S.S.R.Krishna Murthy,I/C HOD Mr.K.Ram Prasad Mr.N.Suneel Kumar Mr.T.Krishna Kumar Mr.K.Abinash Mr.G.Siva Sai Ram			12	6	56(B)

The following are the photographs attached in regard to the event.



The Project Show Case event was closed after taking Group Photograph from all Engineering Departments.

NP
Head of the Department
Mechanical Engineering
N.S. Raju Institute of Technology (A)
Visakhapatnam-531173

DESIGN AND FABRICATION OF SOLENOID ENGINE

A project reports

submitted in the partial fulfillment of the requirements for award of the
degree of

45

Bachelor of Technology

In

Electrical and Electronics Engineering

BY

P. ANIL KUMAR	-	(19NU1A0210)
R. HIMANSHU	-	(19NU1A0211)
D. MOULI	-	(20NU5A0208)
K. JAYANTH	-	(20NU5A0210)
M. RAMESH	-	(20NU5A0214)
S. DURGA TARUN	-	(20NU5A0216)

Under the supervision of

Dr. R. S. R. KRISHNAM NAIDU

Associate Professor



**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY**

(A)

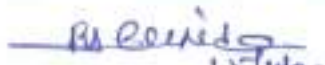
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SONTYAM, VISAKHAPATNAM - 531173


APRIL – 2023

CERTIFICATE

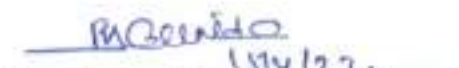
This is to certify that the thesis entitled "DESIGN AND FABRICATION OF SOLENOID ENGINE" is being submitted by Mr. P. ANIL KUMAR, Mr. R. HIMANSHU, Mr. D. MOULI, Mr. K. JAYANTH, Mr. M. RAMESH, Mr. S. DURGA TARUN in partial fulfillment for the award of B.Tech in Electrical and Electronics Engineering to the Jawaharlal Nehru Technological University Kakinada is a record of bonafide work carried out by him under our guidance and supervision. The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree.


Signature of Supervisor

Dr. R. S. R. Krishnam Naidu
Associate Professor


Signature of Head of the Department

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Associate Professor
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Signature of Project Coordinator

Dr. R. S. R. Krishnam Naidu
Associate Professor


Signature of External Examiner

ABSTRACT

In an automobile, engine is the main power source and today, majority of the engines are Internal Combustion (IC) Engines which use either Petrol or Diesel as the main fuel source. The combustion of these fuels in the piston releases heat energy which is converted into mechanical Energy. These fuels release harmful gases after combustion and hence pollute the environment as well as have adverse effects on the living beings. Electric Vehicle are becoming attractive alternative to the vehicles with combustion engine, considering the effect on the environment as well as economic factors such as gradual increasing price of fluid fossil fuels, maintenance and others. Due to the fact that these vehicles are widely known for their zero emission and powered by renewable energy sources.

The idea of the project is to take another alternative design of EV prime mover to replace existing electric motor. In general, EV are driven and controlled by the integration of electrical, electronics and also mechanical components but the main component that actually moves these vehicles is the electric motor. Electric motor works on principles of the electromagnetic induction by converting electrical energy to kinetic energy. This energy conversion is the main purpose of an electric motor and this actuator are highly popularized in most EV's designs.

So, a solenoid will be used to replace the electric motor as a prime mover. For this, a prototype of a solenoid is designed, built, and tested. The solenoid will be used as kicking device. In one study the solenoid is investigated as most suitable kicking device. The other study designed and optimized a solenoid. The objective of this project is to design a solenoid engine which works on the principle of electromagnetism, is used to convert electrical energy into mechanical energy and the power generated is used to drive the vehicle.

CHAPTER – 07: CONCLUSION

The solenoid piston engine incorporates the design of the normal IC engine for most parts of the engine. The cylinder of the engine is replaced by the solenoid and the piston is fitted with a high-power neodymium magnet. The engine operates similar to the IC engine and the configuration of the engine can be done in any configuration that the IC engine uses. This engine is in its infancy stage and has a huge scope for development as almost all of its parts can be developed to provide a higher power and efficiency along with reliability.

As it stands, the engine provides low rpm's and has a lower efficiency than the IC engine, around 20%. But the main factor to be considered is the engine uses electricity as a source of power and it is safer than conventional IC engines in terms of environmental factors. Electricity can be generated renewable and forever by harnessing the solar energy, wind energy, tidal energy, etc.

The engine has all of its components identical to the IC engine. The piston lacks piston rings and the cylinder head replaces the conventional valves and ports with a solenoid. The other components such as the crankshaft, the configuration and the flywheel remain same. The engine can be used to power unmanned low speed vehicles and has a large scope of improvement in the future. This can be seen as one of the potential replacements for IC engines with sufficient developments made to improve power and reliability.

The solenoid piston engine can be considered to be a part of the list of future engine replacements for the IC engine, with an exception that this engine costs the manufacturers less time and money developing the engine and updating their machinery to come up with a new engine.





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has successfully cleared the assessment on

Data science for the Beginners

Aligned to Competency Standards developed by IT-ITes Sector Skills Council
NASSCOM in collaboration with Industry and approved by Government.



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06/03/2023

Date of Issue



Kul Sethi

CEO, IT-ITes Sector Skills Council
NASSCOM

Gold Category: 70% and above score.

Resulted Scorecard Attached

ELECTRICAL POWER GENERATION BY TREADMILL BICYCLE

A Report

Submitted in the partial fulfillment of the requirements for
the award of the degree of

Bachelor of Technology

in

Electrical And

Electronics Engineering

BY

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K. HARSHA VARDHAN	-	(19NU1A0204)
B. PAVAN KUMAR	-	(20NU5A0203)
K. AJAY KUMAR	-	(20NU5A0211)
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NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY
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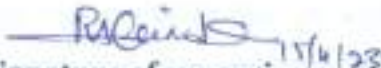
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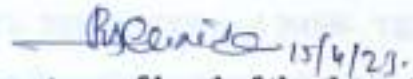
April - 2023

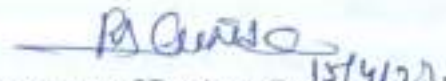
CERTIFICATE

This is to certify that the thesis/dissertation entitled "ELECTRICAL POWER GENERATION TREADMILL BICYCLE" is being submitted by J.SATYA (19NU1A0203), K.HARSHAVARDHAN(19NU1A0204), B.PAVANKUMAR(20NU5A0203), K.AJAYKUMAR(20NU5A0211), K.ANUSHA(20NU5A0212) in partial fulfillment for the award of B.Tech in Electrical and Electronics Engineering to the Jawaharlal Nehru Technological University Kakinada is a record of bonafide work carried out by him under our guidance and supervision.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.


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Signature of Project Co-Ordinator
Dr. R.S.R. KRISHNAM NAIDU, Ph.D.
Associate Professor, HOD
EEE


Signature of external examiner

ABSTRACT

Now a day's exercises play an important role in human life. As we know the exercising will reduce the amount of excess calorie of the body and annihilates the metabolic activities of the body. When doing exercise, a large amount of human energy is get wasted. Our project is mainly aim to convert this energy into sufficient form and for making the exercise more convenient by a new design. For that we designed a bicycle where the pedal of the cycle is fully replaced by a treadmill. The treadmill will drive the rear wheels of the cycle via a chain drive, so that its need only the effort of exercising in treadmill to travel a short distance conveniently. A stand is provided to make the bicycle inclined at stationery state and can be use the bicycle as a perfect treadmill. A powerful dynamo and a battery are provided to the rotating parts of the bicycle so that it can produce and store electrical energy during exercising or travelling. We can use this electrical energy when it is required.

Key Words: Treadmill, chain drive, dynamo, bicycle.

7.2 CONCLUSIONS

This system can be efficiently used anywhere whether it is outdoor or indoor. This utilizes highly fuel-saving technology which is a major requirement of this era. In the future, it can be used as an indoor locomotive device infrastructure with large roof span i.e., malls, warehouse, open markets, large office spaces, etc. By using such product pedestrian cops can protect themselves from getting exhausted. Pedestrians in large campuses can take benefit from this product the same way. We can replace cycle as an energy efficient vehicle for those who cannot drive a cycle.

We developed a branch and bound approach which is coupled with quick, effective bounds to optimize the "Treadmill bicycle" which serves the purpose of exercise and travelling and also reduce the use of non-renewable energy resources.

The design of control architecture was an important aspect of study because a strong interaction between the many different parts was needed. We know that the "Treadmill bicycle" cannot be used on roads due to some drawbacks. But we will correct the drawbacks in the cycle & will be used on road. So, we are satisfied with our project.

The treadmill bike will prove to be a future vehicle as no fuel is used for travelling through this and it is pollution free. The treadmill which is used for walking helps to keep us fit as exercise is also one of the important tasks for a person to be fit and healthy for day-to-day life. Treadmill is cheaper than the normal bike which also makes it efficient and economic.





CERTIFICATE

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NASSCOM in collaboration with Industry and approved by Government.



FBI-2023/1474210

09/03/2023

Date of issue



Kish Sethi

CEO, IT-ITeS Sector Skills Council
NASSCOM

Gold Category, 70% and above score.

Detailed Scorecard included

DESIGN AND MODELING OF ELECTRIC WHEEL CHAIR

A Thesis

Submitted in the partial fulfillment of the requirements for the award of
the degree of

Bachelor of Technology

In

Electrical and Electronics Engineering

BY

K. SAI BRAHMAJI	-	(19NU1A0207)
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B. CHANDRA SHEAKAR REDDY	-	(20NU5A0204)
CH. V S MADHU	-	(20NU5A0206)
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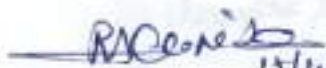
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Certificate

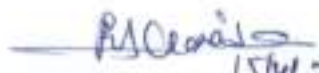
This is to certify that the thesis entitled "Design and modeling of Electric wheel chair" is being submitted by K. SAI BRAHMAJI, A. NARENDRA VARMA, B. CHANDRA SHEAKAR REDDY, CH. V S MADHU, M. GANESH KUMAR in partial fulfillment for the award of B.Tech in Electrical and Electronics Engineering to the Jawaharlal Nehru Technological University Kakinada is a record of bonafide work carried out by his under our guidance and supervision.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.


Signature of Supervisor
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Assistant Professor


Signature of Head of Department
Dr. R.S.R KRISHNAM NAIDU
Associate Professor

Head of the Department
Dept of Electrical & Electronics Engg-
N S Raju Institute of Technology Autonomous
Sontyam, Visakhapatnam - 531 173


Signature of project coordinator
Dr. R.S.R KRISHNAM NAIDU
Associate Professor


Signature of External examiner

ABSTRACT

Wheel Chair is a mobility device designed for shifting patients, moving physically challenged people from one place to another with the help of attendee or by means of self-propelling. The wheel chair is divided into two different types based on the power used for mobility:

1. Manually powered wheelchairs.
2. Electric powered wheelchairs.

Manual powered wheelchairs are driven by manual power which is again classified into foldable and non-foldable with or without commode design. Electrically powered wheel chairs run with electric power however manual operation is required to operate the joystick for the movement of the chair. The redesign of manual wheel chair was considered for this project. The design of wheel chair started by means of literature review to know its evaluation from earlier to the present generation. Market study was carried out to know the present competitors available in the market with cost analysis of the existing product. Ethnography study was done to observe the need, the importance of the existing product and to address the design gap in the existing product to the user need through questionnaires. The feedback was taken from different users and attendees, concept generation and design execution was done by the implementation of design methodologies like Quality Function Deployment, Mind mapping, Product Design Specification. The final output is a wheel chair which gives multiple options to the user and attendee by providing ease of defecation, cleaning and changing of clothes. Adjustable back rest, arm rest, leg rest provides comfort for the patient while resting. The adjustable arm rest provide ease of shifting the patient from chair to the bed or to the vehicle. Facility provided for keeping plate while having food, reading and keeping water bottle. Additional to this alarm facility is provided to inform the attendee that there is a need of his / her presence to the patient. Validation of the prototype is done and usage is found satisfactory. Wheel chair is controlled by hands, lags, head.

6.5 CONCLUSION

So, we can conclude that physically disabled and elderly people can move without any difficulty when they use our smart wheelchair. They no need to be depend on others help anymore to move from one to another place. They also no need to have any extra skills to operate this smart wheelchair because it can be operated just by joystick controller. This wheelchair also reduces the energy wasted by patient to operate the chair. Not only patient, this wheelchair also makes the work of the helper (the person who push the wheelchair) much easier.

Our project, majority of them thinks that this electric wheel chair is necessary mainly in hospitals and believes that it would be better for their medical needs.

There are some patients who disagree with these of wheel chair because there are some type of patients who are moving without their disabled legs and hands and believe without their one hand or leg, they can still able to climb on the bed and operate the manual wheelchair normally. The person helping the patient to push wheelchair are fully agree with our project idea because they understand the burden while pushing the wheelchair with a load (human). Cost of such type of wheelchair will be affordable for all type of hospitals and it will be beneficial for patient handling. It is expected that this electrical Wheelchair would enable people's better medical and with the future recommendations of this project it would greatly reduce time and man-power to the old age home staff.

WORKING PHOTOS



PROJECT PHOTO WITH GUIDE AND CO ORDINATOR





CERTIFICATE OF COMPLETION

Presented to

SAI BRAHMAJI KOPPOJU

For successfully completing a free online course
Electric Vehicle Design

Provided by

Great Learning Academy

(On April 2023)

To verify this certificate visit <https://verify.jyoti.institute/verify/cert/UU1K20R2>

DESIGN AND DEVELOPMENT OF WIRELESS CHARGING SYSTEM

A Thesis

Submitted in the partial fulfillment of the requirements for the award of the
degree of

Bachelor of Technology In

17

Electrical and Electronics Engineering

BY

B.V.S.SANTHOSHI	-	(19NU1A0201)
K.PRASAD	-	(19NU1A0205)
S.CHINNI HARISH	-	(19NU1A0213)
B.VIJAY KUMAR	-	(20NU5A0205)
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Under the supervision of

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Assistant Professor



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NADIMPALLI SATYANARAYANA RAJU INSTITUTE OF TECHNOLOGY
AUTONOMOUS

(Affiliated to JNTUK, Kakinada, Approved by AICTE, New Delhi)

SONTYAM, VISAKHAPATNAM, 531173

APRIL-2023

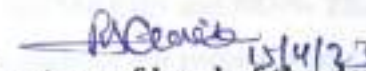
Certificate

This is to certify that the thesis entitled "DESIGN AND DEVELOPMENT OF WIRELESS CHARGING SYSTEM" is being submitted by Ms. B.V.S. SANTHOSHI, K. PRASAD, S. CHINNI HARISH, B. VIJAY KUMAR, K. VENI SRI in partial fulfillment for the award of B.Tech in Electrical and Electronics Engineering to the Jawaharlal Nehru Technological University Kakinada is a record of bonafide work carried out by her under our guidance and supervision.

The results embodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.


Signature of supervisor


Mrs. V. USHA RANI, M.Tech(ph.D)
Assistant Professor


Signature of head of the department

Dr. R.S.R KRISHNAM NAIDU,
Associate Professor,
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Sontyam, Visakhapatnam - 531 173


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Dr. R.S.R KRISHNAM NAIDU,
Associate Professor,
HOD of EEE Dept


Signature of External examiner

ABSTRACT

Day by day new technologies are making our life simpler. Wireless charging through inductive coupling could be done one of the next technologies that bring the future nearer. In this project it has been shown that it is possible to charge low power devices wirelessly via inductive coupling. The wireless power transmitter and receiver have been designed with ultra-low-power and high-efficiency electronic components, thereby maximizing the overall power transfer efficiency. It minimizes the complexity that arises for the use of conventional wire system. In addition, the project also opens up new possibilities of wireless systems in our other daily life uses.

CHAPTER 7

CONCLUSION AND UPGRADE PLAN

7.1 UPGRADE PLAN

The addition and upcoming features in Wireless charging System is:

- As similar to an electrical appliance, the wireless charging system can also be applied to an electrical vehicle.
- It can also be applied in medical purpose devices.

7.2 CONCLUSION

Wireless power technology offers the possibility of removing the last remaining cord connections required to replenish portable electronic devices. This promising technology has significantly advanced during the past decades and introduces a large amount of user-friendly applications. In this article, I have presented a comprehensive survey on the paradigm of wireless charging compliant communication networks. Starting from the development history, we have further introduced the fundamental, international standards and network applications of wireless charging in a sequence, followed by the discussion of open issues and envision of future applications. The integration of wireless charging with existing communication networks creates new opportunities as well as challenges for resource allocation. This survey has shown the existing solutions of providing seamless wireless power transfer through static charger scheduling, mobile charger dispatch and wireless charger deployment. Among those studies, various emerging issues including online mobile charger dispatch strategies, near-field energy beam forming schemes, energy provisioning for mobile networks, distributed wireless charger deployment strategies, and multiple access control for wireless power communication networks are less explored and require further investigation. Additionally, the open issues and practical challenges discussed can be considered as main directions for future research.



Picture with Project Guide



**Picture With Project Co-Ordinator
and HOD**



CERTIFICATE OF COMPLETION

Presented to

BOBBILI VARSHINI SIVA SANTHOSHI

For successfully completing a free online course
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Certificate

This is to certify that the thesis entitled "SOLAR PANEL CLEANING SYSTEM" is being submitted by CH. HARI SATYA TEJA, L. DINESH MANIKANTA, A.V.V. JAGADEESWARAMMA, CH. SRINU, P. BOAZ RAJU in partial fulfillment for the award of B.Tech in Electrical and Electronics Engineering to the Jawaharlal Nehru Technological University Kakinada is a record of bonafide work carried out by his under our guidance and supervision.

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Signature of Supervisor
Mr. A. BALA RAJA RAM (Ph.D)
Assistant Professor

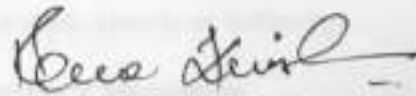


Signature of Head of Department
Dr. R.S.R KRISHNAM NAIDU
Associate Professor

Head of the Department
Dept. of Electrical & Electronics Engg.,
N S Raju Institute of Technology Autonomous
Sontyam, Visakhapatnam - 531 173



Signature of project coordinator
Dr. R.S.R KRISHNAM NAIDU
Associate Professor



Signature of External examiner

ABSTRACT

The project is about to design and development of a solar panel cleaning system. The main objective of this design prototype is to clean the solar panel using an electrical mechanism such that efficiency or quality of solar is not compromised. As a matter of fact, gulf regions especially in pollution areas are facing a lot of dust storms & the solar panels need to be cleaned frequently. If the task is performed manually, it will be very costly and time-consuming. Water sprinkles and a special wiping material shall be used in the conceived mechanism design to insure quality of cleaning.

7.3 CONCLUSION

In conclusion, solar panel cleaning systems can be a worthwhile investment for those who rely on solar energy for power generation. Over time, dust, dirt, and other debris can accumulate on the surface of solar panels, reducing their efficiency and output. By using a cleaning system, these issues can be addressed, improving the panels' performance and prolonging their lifespan. There are different types of solar panel cleaning systems available, including manual cleaning, robotic cleaning, and waterless cleaning. Each method has its advantages and disadvantages, and the choice will depend on factors such as the size of the solar installation, its location, and the specific needs of the user. The Solar Panel Cleaning System project aimed to bring a better solution for maintaining solar efficiency. The main scope was to develop a machine that can clean a solar panel by a proper control system. This project is a developed prototype to expand on a new and increasing market. The project team hit many obstacles along the way.

Designing this system required learning interference with the electrical components. Using soldering boards to implement the designed circuit, hardware wiring, relays and machinery were new experiences. This being said, the project fulfilled the desired design with the planned control and mechanism. The DC motors were controlled by both speed regulator & drives to accomplish speed and directions control. Also, DC motors and the water pump were implemented in the system. Finally connected to the off-grid system. However, the prototype was not completed because of the challenges and the limitations that were mentioned earlier. Ultimately, maintaining solar panels is essential to ensure that they are functioning at their maximum capacity. Regular cleaning can help to increase the energy yield and reduce maintenance costs, making it a worthwhile investment for solar panel owners.





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Studies on influence of process parameters in upgradation of bio-oil derived from HTL of domestic household waste: Application of response surface methodology

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Graphical abstract



Abstract

This research focuses on hydrothermal gasification (HTG) and hydrothermal liquefaction (HTL) studies to produce bio-hydrogen from domestic mixed waste. HTG and HTL studies were studied at temperatures of 300–450°C and 300–400°C, correspondingly, with a catalyst level of 6 wt %. The sol-gel technique was used to make the Bentonite/Nb-TiO₂ catalyst. For a solvent-waste proportion of 14 millilitre/gram, an C₂H₅OH - water proportions of 2:2, and a period of one-hour, maximum H₂ output from HTL was 30 wt % (catalyst loads: 4 wt %) and HTG was 40 wt % (catalyst loads: 5 wt %). As C₂H₅OH acts as half-solvent and ideal solvent to bio-mass capacity it shot up H₂ result in the HTG procedure by methanation, gas water shift and improving responses in the organization. The second output of the HTL procedure was bio-oil, which yielded 35 wt % with O/C as well as H/C standards of 1.2 and 1.0, respectively, and an HHV of 42 Mega Joule/kilogram. In the HTL system, mechanistic procedures such depolymerization, hydration, reduction, and hydrolysis generated in a larger proportion of gaseous product. Thermal and the solvent-to-waste proportion is the ideal factors in the H₂ synthesis

procedure, according to experimental analysis. Energy nexuses from domestic mixed trash are taken over in this research.

Keywords: Domestic waste, bio-oil, RSM, HTG, HTL

1. Introduction

Bioenergy has been viewed as a potential solution to exhaustible fossil fuels in terms of reducing greenhouse gas emissions. For dry biomass, pyrolysis and air gasification are used. As an outcome, there is an upsurge usage. Hydrothermal alteration methods are chosen for valorizing damp organic material to useful biofuel in part to avoid this costly procedure. When related to fossil fuels, H₂ energy is a pure, economical, and sustainable source. The Fischer-Tropsch method can be used to directly or indirectly generate compounds or fuels using H₂ energy. H₂ was produced on a large scale by steam transforming CH₄. Methanation, Gasification, Partial Oxidation, Involvement of photoautotrophic algae and Reforming are some of the other techniques for producing H₂ (Arun *et al.*, 2020). Subcritical and supercritical water gasification are two environmentally preferred ways employed in producing hydrogen from high moisture biomass. Thermochemical process, Hydrothermal gasification (HTG) converts biomass into gaseous products in freshwater systems (Sztancs *et al.*, 2020). HTG was the preferable approach for decomposition of biomass with greater moisture content because it was done beyond the critical point of H₂O. Biomass, temperature, catalyst and pressure to H₂O proportions are all variable in the HTG procedure, depending on the necessity for product assembling.

An increased output of organic garbage in current decades has put significant strain on the atmosphere and trash managing procedures. Among the biodegradable organic wastes that cause significant discomfort are waste paper, animal waste, garden waste, food waste, sludge and sewage (Heidari *et al.*, 2018). The major components of

Ziziphus Jujube seeds derived biomass as cost-effective Biosorbent for the removal of Cr⁶⁺ from aqueous solutions: isotherm and kinetic studies

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Graphical abstract



Abstract

Biosorption of hexavalent chromium ions from the synthetic solution was performed using activated Ziziphus jujube seeds powder as an adsorbent material. A chemical synthesis process prepared the adsorbent, and various methods have evaluated its characteristics. FTIR, SEM and EDX analysis was conducted to check the ability of hexavalent chromium uptake from the synthetic solutions. Batch mode of adsorption process was performed and the adsorption parameters of pH, concentration, dose, contact time and temperature were found in various operating conditions. The entire adsorption process was evaluated by isotherm and kinetic models to check the nature of the adsorption process and its chemical reactions. Thermodynamic studies were conducted, desorption studies were used to recover the spent adsorbent using concentrated hydrochloric acid.

Keywords: Batch adsorption, Ziziphus Jujube seeds, hexavalent chromium, isotherm studies, kinetic studies.

1. Introduction

Clean water is essential to all living beings for consumption and other usages. Water contamination is one of the new issues that we've been dealing with recently. Without clean water, the people and all living creatures cannot survive. Recently, water gets polluted due to various domestic and industrial activities. Due to the rapid population growth and their needs, the industries developed very high and created huge problems for the surroundings (Adeyemo *et al.*, 2015). Tanneries, Electroplating, Dairy, fertilizers, Pulp & paper etc., are the various industries that release huge amounts of wastewater to produce their products. Among various industries, tanneries play an important role in water pollution (Labied *et al.*, 2018). By processing the leather products, a huge amount of chromium metal ions was released into the water bodies through industrial effluent. During the chrome tanning process, the chromium ions have been converted into the hexavalent chromium (Cr⁶⁺) stage, and it becomes highly toxic. Excess amounts of hexavalent chromium consumption may create toxic effects such as lung cancer and respiratory problems (Lucai *et al.*, 2020). Hence, it is necessary to control chromium pollution in water using advanced treatment technologies. Many approaches are used to eliminate harmful pollutant concentrations from aqueous solutions. Chemical precipitation, Ion exchange, Membrane separation, and Adsorption are widely used to reduce the concentration of toxic pollutants in the water. Among these, Adsorption is the process commonly used to reduce the concentration of heavy metals without the generation of any secondary pollutants and sludge (Khan *et al.*, 2020). Using the adsorbate material, the adsorption process produced very high removal efficiency from metal ion removal in wastewater. Many adsorbent substances were utilized to lower heavy metal ion concentrations in wastewater. Organic and inorganic adsorbents such as; banana peels, date seeds, fly ash, orange peels and

An Exploratory Ponder Of Concrete Blend Substitution Of Fines Totally With Plastic

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Abstract

The objective of this investigate is to explore the viability of utilizing squander plastic as fine total substitution in concrete blends. The compressive and malleable qualities of different concrete examples were tried to decide how the consolidation of reused plastic as a substitution fine total would influence the advancement of quality within the blends. Six blends were compared at substitution increases of 0%, 10%, 20%, 30% and 50%. All stages of plastic substitution appeared a discernible diminish in compressive quality. The 10% substitution level as it were appeared a 15% misfortune of compressive quality at 21 days compared to the control. In spite of being much weaker in compression, the malleable quality test appeared that the 10%, 20% and 30% substitution increases were more grounded in pressure compared to the control.

Key words: Concrete, Concrete blends, Plastic percentage & tests for the concrete at various pressures.

I. INTRODUCTION

One of the most popular building materials, concrete, uses a lot of natural resources and energy. Limestone, clay, sand, natural gravel, crushed stone, and water are natural resources that are included into concrete compositions. Our natural resources are being used up at an ever-increasing rate due to the recent growing urbanization of the planet. Therefore, in order to make our construction practices more sustainable, it is vital to develop a new material that uses less energy and natural resources. The use of waste/byproduct materials, such as fly ash, slag, silica fume, and natural pozzolan, to substitute Portland cement in a concrete mixture has been the subject of extensive research. investigated the material impacts of using plastic to substitute aggregate in concrete mixtures

II. EXPERIMENTAL PROGRAM

- A. Material preparation, first for the study's concrete components, river sand, crushed limestone measuring 9.53 mm, type I portland cement, and water were used. Sand and crushed limestone, which were both employed in this study and complied with IS: 2386(Part-III)-1963 for concrete aggregates as fine and coarse aggregate, were chosen as the substitute material for fine aggregate. The experiment's goal was to find the most efficient way to recycle building trash into concrete in order to conserve energy and lessen the amount of plastic waste that must be disposed of in landfills. Since the gradation of sand might serve as a baseline for the desired incorporation of recycled plastic as a fine aggregate replacement alternative, the experiment started by determining the gradation of the fine aggregate. On, a sieve analysis was carried out.



An Experimental Approach to Strength Assessment of Concrete by Fractional Substitution of the Fine Aggregate with Expanded Polystyrene Beads

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Abstract: *Constructions are two types RCC and Steel Structures. In our Country most of the constructions are of RCC. Not only in our country but also in the world most constructions are of RCC type in which Concrete is been used. Even though Cost of concrete is comparatively less than steel, but is somewhat costlier. Ingredients of concrete are water, cement, coarse, sand. But Concrete is Heavier in weight. And when considered for precast structures those might fail at lifting due to mismatch of eccentricity by its own weight. So, in this project Sand in concrete is been partially replaced with Expanded polystyrene (EPS) beads, of 10 to 50 of intermediate percentages and it's compressive strength and Split Tensile Strength are been checked. Because, to reduce cost parameter and also to check the increase of strength parameter which might be an hope. EPS Beads is been considered because it is cheap and abandoned.*

Keywords: *EPS Beads , M20Concrete, etc.*

I. INTRODUCTION

A composite material that consists essentially of a binding medium, such as a mixture of portland cement and water, within which are embedded particles or fragments of aggregate, usually a combination of fine and coarse aggregate. Concrete is by far the most versatile and most widely used construction material worldwide. It can be engineered to satisfy a wide range of performance specifications, unlike other building materials, such as natural stone or steel, which generally have to be used as they are. Because the tensile strength of concrete is much lower than its compressive strength, it is typically reinforced with steel bars, in which case it is known as reinforced concrete.

A. EPS Beads

EPS, or expanded polystyrene, is a rigid cellular plastic originally invented in Germany by BASF in 1950. It has been used in packaging solutions since 1958. It is 98% air but the rest is made from tiny, spherical EPS beads - themselves made only of carbon and hydrogen. EPS structures are produced through a 3 part process called steam moulding that expands these tiny beads to more than 40 times their original size. This expanding process is precisely timed to determine the size the beads will finally reach. It is this final density of the expanded beads that determines the strength of the structure. After the first stage the beads are left to absorb air for between 24 and 48 hours. In the final stage the freshly expanded beads are poured into individually manufactured moulds where steam and pressure are applied to compress and bond the beads into a final structure of the required strength and density.

B. Composition

There are two principal components of EPS: solid styrenic polymer (polystyrene beads) and a blowing agent. The information below will detail the technical information on the components of EPS

II. APPLICATION

A. Construction

- 1) Floor, Ceiling and Wall Insulation
- 2) Structural Insulated Panels (SIPs)
- 3) Sheathing
- 4) Geofoam
- 5) Door Cores
- 6) Insulating Concrete Forms (ICF's)



An Experimental Approach for the Study on Mechanical Properties of M30 Grade Concrete when the Steel Fibers are Induced

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Abstract: Fibre Reinforced Concrete (FRC) material is a developed concrete that has been proposed to improve the tensile behaviour of the concrete using fibres in the concrete mix. Steel Fibre Reinforced Concrete (SFRC) is popular FRC material that is being studied to improve the structural behaviour of members under different load conditions.

This study aims to investigate and examine the structural behaviour of steel fibre reinforced concrete material at different volume fraction of the fibers. Experimental work is conducted for this research to obtain results on the behaviour of SFRC. The experimental work consists of testing concrete under tension and compression.

A result data obtained has been analyzed and compared with a control specimen (0% fiber).a relationship between aspect ratio Vs compressive strength, aspect ratio Vs split tensile strength represented graphically. Result data clearly shows percentage increase in 28 days compressive strength and split tensile strength for M30 Grade of concrete.

Keywords: Steel Fibres, M30 Grade Concrete, SFRC, Strength Comparison, etc.

I. INTRODUCTION

Plain concrete slabs are known to have low strength and low strain capacity, however these structural properties could be improved by addition of fibres, allowing the thickness of the layer to be reduced. There are different fibres that are used in the concrete namely glass fibre, steel fibre, synthetic fibres and natural fibres. The improvement in the material behaviour of the fibre reinforced concrete depends on dosage and characteristics of the used fibres. The main important effect of fibres as reinforcement is to influence and control the tensile cracking of concrete. Yet, the fibre reinforced concrete is known to have considerable impact on the slab cost owing to reduced thickness needs, prolonged useful life and reduction in maintenance costs. Amongst the fibres mentioned, steel fibres are the most researched and more practical. Steel fibre reinforced concrete is a type of concrete that contains randomly oriented discrete steel fibres. The main aim of addition of steel fibres to concrete is to control crack widening and crack propagation after the concrete matrix has cracked. By control of the cracking the mechanical properties of the composite material as a result will be improved significantly.

II. OBJECTIVE OF THE STUDY

- 1) Review previous research on FRC material and structural behaviour of structural members.
- 2) Review previous experimental research on the impact behaviour of slabs and use of fibers.
- 3) Review the numerical studies conducted by previous researchers to analyse the impact behaviour of slabs.
- 4) To evaluate the effect of end hooked steel fibers on concrete mechanical behaviour consisting compressive strength, split tensile strength, flexural strength, and ductility.
- 5) To examine the effect of fiber volume fraction on SFRC material performance.
- 6) To make a comparison for the performance of concrete with and without steel fibre reinforcement on the material levels both graphically and qualitatively.

III. STEEL-FIBERS

B Steel fiber is a metal reinforcement. Steel fiber for reinforcing concrete is defined as short, discrete lengths of steel fibers with an aspect ratio (ratio of length to diameter) from about 20 to 100, with different cross-sections, and that are sufficiently small to be randomly dispersed in an unhardened concrete mixture using the usual mixing procedures. In this experimental approach, **Flat Crimped Steel Fibers** are used. The length of these fiber is 50 mm and diameter of 0.75 mm, whose aspect ratio is 65. These steel fibers exhibits a tensile strength of greater than 900 Mpa, which is conformed to ASTM A 820 & EN 14889 – 1 global standards.



An Experimental Approach to Study the Properties of Self-Healing Concrete by Replacing Fine Aggregate with Glass Powder and Demolished Waste

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Abstract: Bacterial concrete is a material, which can successfully remediate cracks in concrete. This technique is highly desirable because the mineral precipitation induced as a result of microbial activities is pollution free and natural. To repair the cracks in concrete is a tedious job and in turn is expensive. So to avoid these, a special bacteria is induced in the concrete which reacts with calcium to form calcium carbonate crystals which blocks the cracks formed in the concrete. To make the Bacterial Concrete more affective in crack reduction, we used glass powder as partial replacement for fine aggregate of about 15 percentage. And construction waste is completely replaced in place of coarse aggregate.

Keywords: Bacterial Concrete, Calcium carbonate crystals, Glass Powder, Construction debris, Workability, etc.

I. INTRODUCTION

To overcome this problem (crack failures) the concrete is prepared with the addition of bacteria which tends to heal (block the cracks) the concrete by itself. A bacteria known as Bacillus Bacteria. Bacillus bacteria is a group of different Bacterial family which contains Bacillus Megaterium, Bacillus pseudofirmus, Bacillus subtilis, Bacillus pasteurii, Sporosarcina pasteurii, etc.,. The Bacillus Megaterium is the bacteria used in this experimental approach. Bacillus Megaterium reacts with calcium and forms precipitation of calcium carbonate crystals, which usually blocks the cracks. In addition to bacterial concrete, we use glass powder as partial replacement to fine aggregate (sand) of about 15 percentage. Glass powder gives shining appearance to the concrete, it is also act as a water resistant material. The coarse aggregate was fully replaced by the demolished waste (construction waste) which improves strength of concrete. These are some of the major waste materials produced from the community. So by implementing this technique we can reuse some amount of industrial & constructional waste in construction work.

II. OBJECTIVE OF THE STUDY

- 1) To develop and observe the strength comparison of self-healing concrete with normal concrete.
- 2) To Develop efficient self-healing techniques for the cracks developed by creep of concrete.
- 3) To observe the healing of cracks by bacterial precipitation.
- 4) To investigate the effect of bacillus megaterium bacteria in gaining strength.
- 5) To observe the effect of demolished waste and glass powder in concrete before and after mixing.

III. BACTERIA

Bacillus megaterium is a soil-dwelling bacteria that is commonly used in agriculture as a bio-fertilizer. It can fix atmospheric nitrogen in the soil, making it available to plants, and can also produce plant growth-promoting compounds such as indole acetic acid and gibberellins. Additionally, B. megaterium can also act as a bio-pesticide by producing compounds that inhibit the growth of plant pathogens. It can also be used to ferment organic waste and produce organic acids and enzymes which can be used as a soil conditioner. Bacillus megaterium is a motile rod-like, Gram-positive, mainly aerobic and spore forming bacterium ubiquitous in the environment. Bacillus megaterium bacteria is mixed in liquid form to concrete.

Properties of Bacillus Megaterium bacteria

Scientific Name = Priestia Megaterium

Size of Bacteria = 4*1.5 microns