

FABRICATION OF RUBBER CRUMB IN POLYMER COMPOSITE MATERIAL

PROJECT REPORT

submitted by

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to

The APJ Abdul Kalam Technological University

in partial fulfilment of the requirements for the award of the Degree

of

Bachelor of technology in Mechanical Engineering



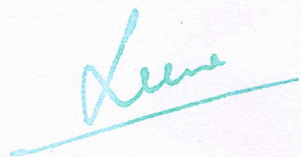
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DECLARATION

I undersigned hereby declare that the project report ("**FABRICATION OF RUBBER CRUMB IN POLYMER COMPOSITE MATERIAL**"), submitted for partial fulfilment of the requirements for the award of degree of Bachelor of Technology of the APJ Abdul Kalam Technological University, Kerala is a Bonafede work done by me under supervision of (**Asst.Prof.DIVYATHEJ M.V**) This submission represents my ideas in my own words and where ideas or words of others have been included, I have adequately and accurately cited and referenced the original sources. I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. I understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed the basis for the award of any degree, diploma or similar title of any other University.

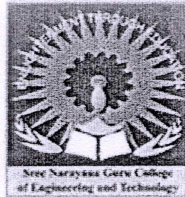
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ACKNOWLEDGEMENT

We are grateful to the co-operation and constant encouragement by our Head of the Department Prof. JACOB THOMAS and project coordinator **Asst.Prof. RAHUL A.M.** their regular suggestions made our work easy and proficient. We would like to express our profound gratitude to our guide **Asst.Prof. DIVYATHEJ M V**, for his/her invaluable support, encouragement, supervision and useful suggestions throughout this project work. Their moral support and continuous guidance enabled us to complete our work successfully. We wish to express our appreciation to all the staff members of ME department of our college who helped to overcome our doubts in doing this project.

We are heavily indebted to our Principal **Dr. LEENA AV** for his/her constant inspiration assistance throughout the project. We wish to thank our parents for their undivided support and interest who inspired us and encouraged us to go our own way.

We are grateful to the staffs at 'NIT CALICUT' who helped us for the material testing, Mr. Naushad and Mr. Akshay.

ABSTRACT

Despite technological developments, modern methods for the disposal of end-of-life tires most often involve either their incineration in cement kilns or the destruction of tires in special landfills, demonstrating a lack of sustainable recycling of this valuable material. The fundamental role of recycling is evident, and the development of high-efficiency processes represents a crucial priority for the European market. Therefore, the investigation of end-of-life rubber processing methods is of high importance for both manufacturers and recyclers of rubber materials. In this paper, we review existing methods for processing of end-of-life tires, in order to obtain rubber crumb, which can later be used in the production of new industrial rubber goods and composites. We consider processes for separating end-of-life tires into fractions (in terms of types of materials) using chemical, mechanochemical, and mechanical methods to process the materials of used tires, in order to obtain crumb rubber of various fractions and chemical reactivities.

KEYWORDS: *Recycling, Tires, Rubber Crumbs, hardness, tensile, resin, fibreglass*

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HYBRID VEHICLE BY USING NON-CONVENTIONAL ENERGY SOURCES

PROJECT REPORT

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to

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in partial fulfilment of the requirements for the award of the Degree

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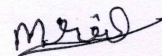
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ACKNOWLEDGEMENT

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Thank you

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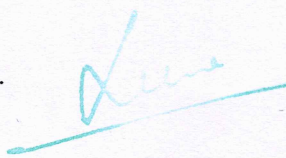


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ABSTRACT

This paper proposes a Hybrid Electric Vehicle (HEV) system which solves the major problems of fuel and pollution. We need renewable energy in our world today, since we will soon exhaust the nonrenewable sources that we use. Wind energy is a clean and sustainable natural resource that has yet to be fully utilized in the automotive industry. Also, the sun is probably the most reliable source of renewable energy available today. The hybrid system has been designed and installed to generate power which combines more than one type of energy source, like in this case solar and wind energy is being used. Hybrid models are renewable energy systems that can help conserve energy by reducing the use of fuel in vehicles. Hence developing a reliable method for the economical evaluation of Hybrid Systems for electricity production. These non-renewable energy sources can be saved by using hybrid electric vehicles. The basic principle of a solar vehicle is to use energy stored in a battery after it has been charged by a solar panel. Power generated by renewable energy sources has recently become one of the most promising solutions for the electrification of islands and remote rural areas. But the high dependency on weather conditions and the unpredictable nature of these renewable energy sources are the main drawbacks. To overcome this weakness, solar energy combined with wind energy can be used. The charged batteries are used to drive the motor which serves here as an engine and moves the vehicle in reverse or forward direction. This idea, in future, may help to protect our fuels from getting extinguished. For the first time, this study has provided a renewable energy-based replacement for the internal engine in a hybrid electric vehicle. A battery/solar panel/wind hybrid power source is proposed to replace the internal combustion engine with a small-size solar panel positioned on the roof of the Hybrid Vehicle (HV), and a micro wind turbine located in front of the HV, behind the condenser of the air conditioning system. The proposed power source is composed of a Lithium (Li)-ion battery, an auxiliary renewable energy based Photovoltaic (PV) module, and a wind energy conversion system, including a micro wind turbine. There is a need to construct a prototype of a battery/PV/wind hybrid power source. Experimental verifications need to be presented that demonstrate the utilization of the PV module and the micro wind turbine and prove this will provide a higher power efficiency and speed than would normally be possible for a hybrid electric vehicle.

Keywords: hybrid vehicle, renewable energy, solar energy, wind energy.



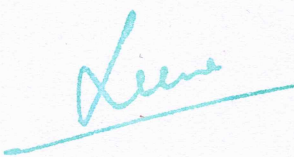
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FLOATING WASTE COLLECTING ROBOT

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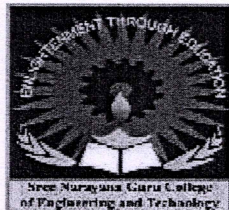
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DECLARATION

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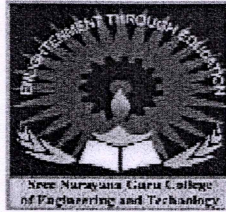
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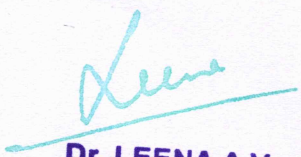
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ABSTRACT

Marine pollution, particularly from floating waste, poses a significant threat to the health of our oceans and ecosystems. To address this challenge, we propose the development of an Unmanned Floating Waste Collecting Robot (UFWCR), an autonomous robotic system designed to efficiently and effectively collect and remove debris from marine environments. This project's future expansion is to leverage , artificial intelligence, and environmental sensing technologies to create a self-sustaining solution that can operate autonomously in various marine environments.

The implementation of the Unmanned Floating Waste Collecting Robot has the potential to significantly contribute to marine pollution mitigation efforts. By autonomously collecting and removing floating waste, the UFWCR can help protect marine ecosystems, preserve biodiversity, and reduce the detrimental effects of pollution on aquatic life. Moreover, this project aims to raise awareness about the importance of waste management and promote sustainable practices to safeguard our oceans for future generations. In this project we use conveyor belt mechanism to collect the waste and transfer it to a collecting panel. The rotating mechanism is used for the motion of the robot.

KEYWORDS: Conveyor belt , Rotating mechanism, Artificial Intelligence



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**AUTOMATIC SOLAR CHARGING HYBRID GRINDING AND
CUTTING MACHINE
PROJECT REPORT**

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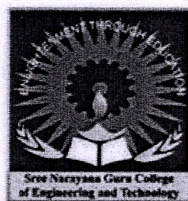
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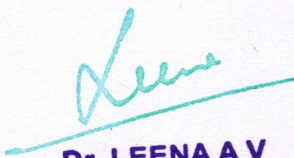


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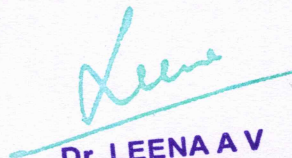
We undersigned hereby declare that the project report ("**AUTOMATIC SOLAR CHARGING HYBRID GRINDING AND CUTTING MACHINE**"), submitted for partial fulfilment of the requirements for the award of degree of Master of Technology of the APJ Abdul Kalam Technological University, Kerala is a Bonafede work done by me under supervision of **Mr. JACOB THOMAS, Asst. Prof. in Mechanical Engineering**. This submission represents my ideas in my own words and where ideas or words of others have been included, I have adequately and accurately cited and referenced the original sources. I also declare that I have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. I understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed the basis for the award of any degree, diploma or similar title of any other University.

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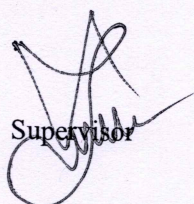

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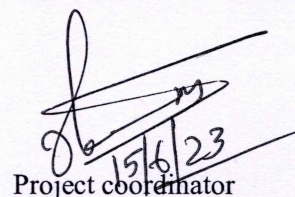
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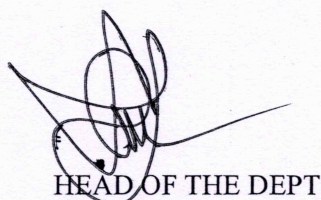


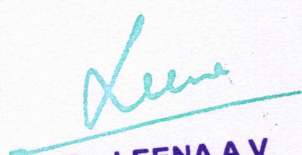
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This is to certify that the report entitled “**AUTOMATIC SOLAR CHARGING HYBRID GRINDING AND CUTTING MACHINE**” submitted by ‘**ARSH IBRAHIM (SNC19ME005), MOHAMMED RAMADAN ANWAR (SNC19ME012), SAFVAN I M (SNC19ME015), VIDYASAGAR P (SNC19ME018)**’ to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in (8th semester) is a Bonafede record of the project work carried out by him/her under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.


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Project coordinator

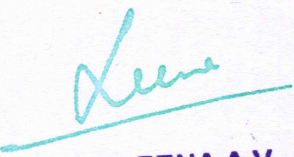

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ACKNOWLEDGEMENT

We are grateful to the co-operation and constant encouragement by our Head of the Department and our guide **Mr. JACOB THOMAS, Asst. Prof. Mechanical Engineering** and project co-ordinator **Mr. RAHUL A.M, Asst. Prof. Mechanical Engineering**, their regular suggestions made our work easy and proficient. Their moral support and continuous guidance enabled us to complete our work successfully. We wish to express our appreciation to all the staff members of ME department of our college who helped to overcome our doubts in doing this project.

We are heavily indebted to our Principal **Dr. LEENA AV** for his/her constant inspiration assistance throughout the project. We wish to thank our parents for their undivided support and interest who inspired us and encouraged us to go our own way.



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ABSTRACT

This project deals with the fabrication of automatic charging solar grinding and cutting machine, when grinding a work piece which works in the principle of automatic charging system. The main features of this machine are electric power saving, more easily, reduces fatigue. It is used for grinding any shape of object like Circular, Rectangular, and Polygon. In our project grinding machine is used to grinding the different types of material. The grinding machine is rotated by the DC motor. AC main supply also is used to grinding the work piece. Solar panel is used to charge the battery by using photovoltaic principle.

According to the type of material to be grind, the grinding tool can be changed. This machine can be widely applied in almost all type of industries. The principle parts of this attachment are main body, motor with pulley, bearings, spur gear system and DC generator etc. This machine is fixed on the worktable, where the compound rest. Where the motor is on, the abrasive grinding stone and the roller wheel will be rotated. The DC generator is used to store the electrical energy to the battery, which is coupled to the shaft with the help of belt drive.

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HILL HOLD ASSIST ON MANUAL TRANSMISSION VEHICLES

PROJECT REPORT

submitted by

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MOHAMMED AAFIL ISMAYIL M K (SNC19ME011)

to

The APJ Abdul Kalam Technological University

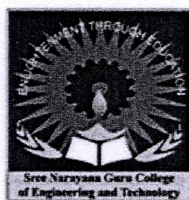
in partial fulfilment of the requirements for the award of the Degree

of

Bachelor of Technology

In

Mechanical Engineering




Department of Mechanical Engineering

Sree Narayana Guru College of Engineering and Technology,

Payyanur

JUNE 2023


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DECLARATION

We undersigned hereby declare that the project report “**HILL HOLD ASSIST ON MANUAL TRANSMISSION VEHICLES**”, submitted for partial fulfilment of the requirements for the award of degree of Batchelor of Technology of the APJ Abdul Kalam Technological University, Kerala is a Bonafede work done by us under supervision of **Dr. SUDHIN CHANDRAN**, Assistant Professor, Department of ME. This submission represents our ideas in our own words and where ideas or words of others have been included, We have adequately and accurately cited and referenced the original sources. We also declare that we have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in our submission. We understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed the basis for the award of any degree, diploma or similar title of any other University.

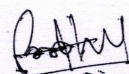
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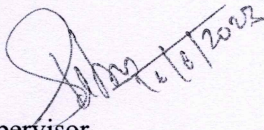
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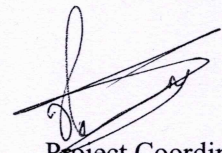
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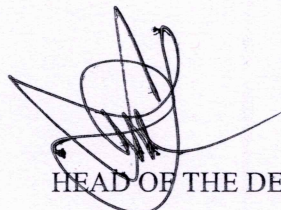



CERTIFICATE

This is to certify that the project report entitled "**HILL HOLD ASSIST ON MANUAL TRANSMISSION VEHICLES**" submitted by '**ADARSH P K (SNC19ME001), ATHUL B (SNC19ME007), MOHAMMED AAFIL ISMAYIL M K (SNC19ME011)**' to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology is a Bona fide record of the project work carried out by him/her under my/our guidance and supervision. This report in any form has been submitted to any other University or Institute for any purpose.


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ACKNOWLEDGEMENT

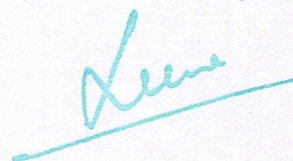
We would like to extend our gratitude to everyone who helped us in the completion of this project. We express our sincere gratitude to our Management **SREE BHAKTHI SAMVARDHINI YOGAM, TALAP, KANNUR** for having us provided with all the facilities required for the success of this presentation. We would like to express our sincere gratitude to our Principal **Dr. LEENA A V** for providing the necessary tools. We are greatly obliged to **Mr. JACOB THOMAS**, Head of the Department of ME and project coordinator **Mr. RAHUL A.M**, Assistant Professor, Department of ME for giving us this opportunity and encouragement throughout the presentation. We would like to thank our guide, **Dr SUDHIN CHANDRAN**, Assistant Professor, Department of ME, Sree Narayana Guru College of Engineering and Technology, Payyanur for his great support and guidance. We, on this occasion, remember the valuable suggestions and constructive criticism from our teachers which were inevitable for the successful completion of our project.

Thanking you

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ABSTRACT

Road transport safety is an important issue in the land transport sector all over the world due to the increment in the usage of automobiles in few decades. It is highly likely that ineffective braking is to blame for a number of car accidents that result in catastrophic injuries. Between 20 and 30 percent of all work-related deaths and major injuries each year are caused by reversing vehicles. This is a scientifically proven fact. The paper presents "HILL HOLD ASSIST ON MANUAL TRANSMISSION VEHICLES" for both light and heavy vehicles. This paper outlines system requirements to successfully develop and deploy a less complicated, safe and secure mechanism for the uncontrolled reverse motion of the vehicle on hilly terrains.

This mechanism consists of a vehicle and ratchet & pawl connected to the rear drive shaft of the vehicle and an electromagnet which will control the movement of the pawl while engaging or disengaging the mechanism. The engaging mechanism will represent the reverse motion is undesirable or to be restricted and disengaging mechanism when the reverse motion is desirable. Technically, this mechanism encounters the issue free motion of the shafts of the gearbox as the vehicle tries to roll downhill when the clutch is pressed (disengaged) for the moments in which driver shifts his foot from the brake pedal to accelerator pedal to accelerate the engine. Such mechanisms restrict one or the other shaft(s) of the gearbox to rotate opposite under the influence of wheels, thereby restricting vehicle to roll back in opposite direction. In this work the mechanism has been developed to stop the vehicle from rolling backwards when the vehicle is moving in the hill roads.

KEYWORDS : *Ratchet, Pawl, Electromagnet*

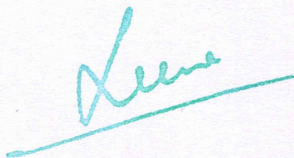


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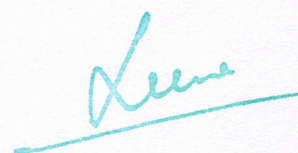
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