



## K.D.K. COLLEGE OF ENGINEERING, NAGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

"DESIGN AND FABRICATION OF TREADMILL TO GENERATE ELECTRICITY BY HUMAN POWER"

Name of the Student's: 1. Kantesk Thakare, 2. Harsh Gotmare 3. Harsh Rangari

Name of the Guide: Dr. V.B. Vaidya

DEPARTMENT OF ELECTRICAL ENGINEERING

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Name of the Guide: Dr.G.H.Agrawal

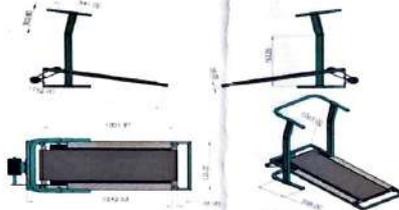
Session: 2024-25

**Abstract:** The rising cost of electricity is attributed to inadequate power generation and increasing energy demands. Traditional power generation methods, particularly those relying on non-renewable sources, have detrimental environmental impacts. Therefore, there is a pressing need for alternative, eco-friendly power generation techniques. This study explores a novel approach to power generation utilizing manual treadmills. A treadmill's rotating shaft can be connected to a generator, enabling the conversion of human motion into electrical energy. This method is entirely pollution-free and can generate approximately 50-60 watts of power per hour. As an individual walks on the manual treadmill, they exert force on its surface, which causes the treadmill's shaft to rotate. This rotational energy is mechanically coupled to a small DC generator, which produces variable output due to the intermittent nature of the force exerted. To stabilize the output, a charge controller is employed, ensuring a constant supply of power. The generated electricity is stored in a battery for later use. This approach offers a sustainable and innovative solution for small-scale power generation.

### Introduction:

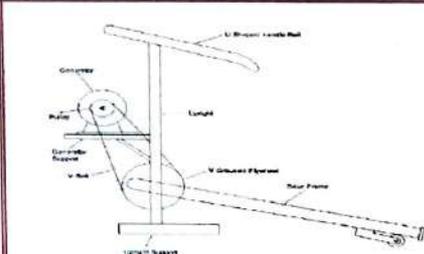
Power hacksaws are specialized machines designed for cutting large metal or plastic shafts and rods, particularly those with diameters exceeding 15 millimetres. Cutting such materials manually with a standard hand-held hacksaw is a labor-intensive and time-consuming task. To address these challenges, the power hacksaw machine was developed in the 1920s in the United States. This machine is classified as an automatic tool, as it eliminates the need for the operator to manually provide the reciprocating motion or apply downward force to the workpiece during the cutting process. Once the workpiece is fed to the desired length and the machine is activated, the power hacksaw automatically performs the cutting operation until the workpiece is completely divided into two parts.

### Implementation/Simulated Designs:



### Conclusion:

The innovative treadmill-based electricity generation system discussed in this research presents a promising and sustainable solution for addressing the growing demand for energy while simultaneously reducing environmental pollution. By harnessing kinetic energy produced during human activity, such as walking or running, the proposed system converts mechanical motion into electrical power through a simple, eco-friendly process. The integration of a small DC generator, coupled with a charge controller, enables the production of up to 50-60 watts per hour, providing a potential source of clean energy, particularly in areas with limited access to conventional power sources. This research emphasizes the feasibility of using manual treadmills as a viable means for small-scale power generation, making it an attractive solution for both individual and community-level applications. The system is especially valuable for regions where electricity infrastructure is insufficient or where environmental sustainability is a priority. The treadmill generator's simple design, low production cost, and ease of implementation ensure its scalability, making it suitable for widespread adoption. Furthermore, the integration of fitness and energy generation promotes dual benefits—enhancing public health while contributing to energy conservation. This project paves the way for further development in clean, human-powered energy systems, offering a unique approach to mitigating the negative impacts of energy production from non-renewable sources. Overall, the research underscores the potential of this innovative treadmill system to support sustainable energy practices, reduce reliance on fossil fuels, and promote a greener, healthier future.



### Advantages:

The proposed treadmill with an electricity generator offers several benefits, which enhance its utility and effectiveness:

- Health and Fitness Benefits:** The exercise treadmill bicycle promotes physical fitness, which is essential for maintaining good health in daily life. Traditional gym workouts can become monotonous, especially in enclosed spaces. This portable treadmill allows users to exercise outdoors, enjoying fresh air and a more engaging workout experience.
- Energy Saving:** The use of the treadmill generates electricity, contributing to energy conservation. By harnessing kinetic energy from the user's movement, a certain amount of electricity is produced, which can be used for domestic applications or stored for later use. This system helps reduce energy wastage and provides a sustainable source of power.
- Eco-Friendly:** The treadmill operates without the need for any fuel, making it an environmentally friendly device. It does not produce any harmful emissions, contributing to reduced pollution and supporting eco-friendly practices.

### References:

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PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Name & Sign of Student						Name & Sign of Guide					
Kantesk Thakare			Shailesh Motghare			Dr. V.B. Vaidya					
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Harsh Rangari			Aditya Chikte								



## K.D.K. COLLEGE OF ENGINEERING, NAGPUR

DEPARTMENT OF MECHANICAL ENGINEERING

"FABRICATION OF GO KART"

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Name of the Guide: Prof. V. D. Dhopte

Session: 2024-25

**Abstract:** This project focus on the fabrication of a high-performance go-kart using suitable material. The main objective is to construct a robust and lightweight chassis that can withstand the extreme hard conditions of racing while ensuring safety and performance. The fabrication process will involve cutting, welding, and assembling various components, including the frame, engine mounting, axles, and steering system. The project will explain the step-by-step fabrication techniques going to used, including the selection of appropriate tools and equipment, as well as safety measures to be followed during the process. We will give special attention towards precision in measurements and weld quality to ensure structural integrity, with possible cost efficiency.

### Introduction:

Our work concentrates fabrication process involved in making of a Go Kart based on the rules and regulations in ISNEE Motorsport's (Indian Society of New Era Engineers) 12th GKDC rulebook, 2024 (This rule book changes every year on considering the safety and innovative ideas). This report will explain fabrication techniques and the appropriate fabrication process that are going to perform for fabrication of a Go Kart. The team's primary objective is to fabricate a strong and robust Go kart by applying our engineering skills. To achieve this goal, we will explore essential fabrication techniques, including cutting, welding, and assembly, while emphasizing safety and quality control. Ultimately, this project not only enhances our understanding of mechanical principles but also improve teamwork and problem-solving skills as we work towards creating a functional and efficient go-kart.

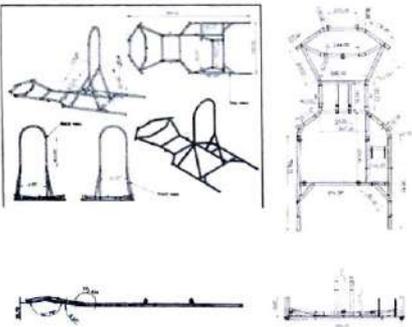
### Fabricated Vehical :



### Conclusion:

The fabrication of the go-kart project has successfully done with the application of engineering principles and hands-on skills. Through careful design, material selection, and assembly processes, we have created a functional and robust vehicle that meets performance expectations and also satisfies the preferred rulebook. This project not only enhanced our understanding of mechanical systems and teamwork but also highlighted the importance of safety and precision in engineering. The experience gained throughout the project will serve as a valuable foundation for future projects and innovations in automotive design.

### Implementation/Simulated Designs



### RESULT:

- a. The frame was designed to be both lightweight and durable, made from mild steel tubing for strength and ease of welding. The chassis structure provided a solid foundation for the other components.
- b. A 150cc Honda Dazzler engine was used, offering a good balance of power and efficiency.
- c. The engine was connected to the rear wheels via a chain drive system, enabling smooth power delivery.
- d. The braking system consisted of disc brakes on the rear axle, offering good stopping power and control.
- e. A roll cage was installed to provide driver protection in the event of a rollover.

### References:

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- 9) Links :-
  - a) [www.wikipedia.org](http://www.wikipedia.org)
  - b) [www.kartbuilding.net](http://www.kartbuilding.net)
  - c) [www.howstuffworks.com](http://www.howstuffworks.com)
  - d) [www.chevy.com](http://www.chevy.com)

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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**K.D.K. COLLEGE OF ENGINEERING, NAGPUR**  
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**"FABRICATION OF THERMAL IMAGING DRONE"**

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Name of the Co-Guide: Dr. G. H. Agrawal (DEPARTMENT OF ELECTRICAL ENGINEERING)

Session: 2024-2025

**Abstract:** Thermal imaging drone Fabrication is transforming various industries by enabling efficient, real-time detection and monitoring in complex and low-visibility environments. This project outlines the design, development, and testing of a thermal imaging drone system, integrating lightweight sensors, advanced image processing, and autonomous navigation capabilities. The system captures high-resolution thermal data and preprocesses it using noise reduction and enhancement techniques to improve clarity and usability. The drone demonstrated stable flight, efficient power consumption, and accurate detection performance with minimal error. These results highlight the strong potential of thermal drones to enhance safety, automation, and operational efficiency across multiple sectors.

**Introduction**

Thermal Imaging Drone Fabrication integrates Unmanned Aerial Vehicles (UAVs) with infrared imaging systems to detect and interpret heat signatures for various applications. This innovative technology proves effective in low-light or challenging conditions, making it highly valuable in fields like disaster management, industrial inspections, environmental monitoring, and precision agriculture. The project emphasizes the integration of thermal imaging, enhancing automation and decision-making efficiency.

**Implementation/ Simulated Design**

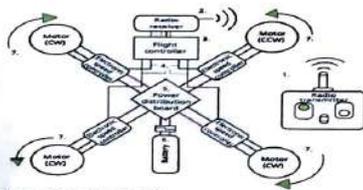


**THERMAL DRONE**

**Conclusion**

The thermal drone prototype met all performance expectations and demonstrated reliable real-time detection capabilities. The project showcases successful integration of electronics, and aerodynamics for practical applications in surveillance, SAR operations, and infrastructure monitoring.

**Block Diagram for Drone Construction**



Source: "Technology Channel" 2019.

**Advantages**

**Advantages of Thermal Imaging Drones:**

- See in the dark and through smoke/fog.
- Detect heat sources (people, fires, machinery).
- Improve search & rescue and firefighting
- Spot faults in buildings, power lines, and crops.
- Enhance safety with remote inspections.

**References**

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**Program Outcomes (Po's)**

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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