Industrial Engineering Journal
ISSN: 0970-2555
Volume : 54, Issue 3, No.1, March : 2025

A REVIEW OF FOOT STEP POWER GENERATION BY RACK AND PINON MECHANISM

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ABSTRACT
The Now a day's energy and power are the back bone of the introductory requirements in this ultramodern world. Energy demand is adding day by day. On the other hand, the numerous energy coffers are getting exhausted and wasted. Offer for application of waste energy of bottom power with mortal locomotion is veritably applicable in populated countries like India where roads, road stations, machine stands, tabernacles, etc.. This whole energy is wasted. If this energy made possible for application it'll be a great invention. In this design we're converting non-conventional from just walking bottom step into electrical energy. This design uses simple drive medium similar as rack and pinion assembly. For this design the conversion of the force energy in to electrical energy. The control medium carries the rack pinion, D.C creator. Multiple step power creators at similar places can be used to increase the yield of power generated. Our proposed system uses rack and pinion arrangement along with gears and spring grounded arrangement to induce power from steps. The system allows for an effective power creator medium. We use a rack to transfer power from mortal steps to a gear attached to a shaft; the power is also transferred to another gear through a gear grounded arrangement. We've bandied the colorful operations and farther extension also so this design is enforced to all bottom steps, the power Generation is high.
Keywords: smart DC generator, rack and pinion, led's, non-conventional energy

INTRODUCTION:
Man has demanded and used energy at an adding rate for his food and well- being ever since he came on the earth a many million times agone. With farther demand for energy, man began to use the wind for sailing vessels and for driving windmills, and the force of falling water to turn water for sailing vessels and for driving windmills, and the force of falling water to turn water bus. This bottom step energy is being wasted if can be made possible for application it'll be great invention and power producing platform will be veritably useful energy sources in crowded countries. Attempts have been made to harness energy from steps using different direct rotary stir metamorphosis mechanisms. They include Rack and Pinion medium, Roller Medium and Crankshaft Medium. It's observed that the comber medium was challenging to maintain and was agonized with collision problems. It's also editorialized that the coil- shaft medium had balancing issues, and it was prone to mechanical vibration. A rack and pinion is a type of direct selector that comprises a brace of gears which convert rotational stir into direct stir. A indirect gear called " the pinion " engages teeth on a direct gear bar called" the rack"; direct stir applied to the rack causes the pinion to move relative to the rack, thereby rephrasing the direct stir of the pinion into rotational stir.

LITERATURE:
The paper proposes a system for generating electricity from foot power, which is particularly relevant to populated areas like India. The system utilizes a simple rack and pinion assembly to convert the mechanical energy of walking into electrical energy. The authors suggest that this

method could be a valuable source of non-conventional power, addressing the increasing demand for energy while also minimizing waste [1]. The authors suggest that this system provides a cost-effective and easily deployable solution for producing non-conventional energy. The paper emphasizes the environmental impact of traditional energy sources and underscores the importance of finding alternative energy solutions. The paper concludes by exploring potential applications and future advancements for this footstep power generation system [2]. The paper proposes a novel system for generating electricity using the mechanical energy of footsteps. The system utilizes a gear train mechanism, rack and pinion assembly, and chain drive to convert the energy of walking into electrical power. The authors argue that this system can be generate electricity with minimal energy input. The paper discusses the potential of this system to contribute to renewable energy sources and address energy shortages [3].The paper talks about the power generation using foot step. It is very useful to the places like all roads and as well as kind of foot step which is used to generate the non-conventional energy like electricity [4].The paper investigates three different methods for generating electricity from footsteps piezoelectric sensors, rack and pinon, fuel systems. This method utilizes a simple mechanism to convert the force from footsteps into electrical energy, making it a promising solution for generating electricity in areas with high foot traffic [5]. The proposed system can generate electricity from human footstep energy using a rack and pinion mechanism. The system has the potential to provide a renewable energy source, reduce fuel consumption, and decrease greenhouse gas emissions. The authors identify several 10 potential applications for the system, including powering streetlights, homes, and businesses in crowded urban areas [6].This paper focuses on designing a footstep power generation system utilizing a rack and pinion gear mechanism. It highlights the critical need for alternative energy sources due to increasing energy consumption. The authors propose harnessing the wasted energy from human footsteps. Their system converts the mechanical energy of walking into electrical energy through the rack and pinion gear mechanism. The paper emphasizes the potential of this non conventional method for generating electricity, addressing the growing energy demand [7].The paper aim is to demonstrate the utilization of energy from commonly used footsteps the increasing steps in buildings in smaller structures the potential for energy tapping and utilization is significant [8].This paper uses the system utilizes piezoelectric sensors, an Arduino Uno microcontroller, and an LCD display. Footsteps compress the sensors, generating electricity that is processed and displayed. The design focuses on safety, cost-effectiveness, and reliability, incorporating springs for pressure absorption and parallel sensor connections for increased output. The prototype successfully generated power, with testing showing a correlation between step count and output voltage/current [9]. It describes the process of converting kinetic energy from footsteps into rotational motion, which drives a generator to produce electricity. The authors discuss the advantages of this technology, including its clean and renewable nature, suitability for high-traffic urban areas and the paper analyzes the system's performance, considering power output, efficiency, and durability [10].This paper explores the use of piezoelectric materials for footstep energy harvesting, aiming to power portable electronics and contribute to sustainable energy solutions. It focuses on converting mechanical stress from walking into electrical energy using PZT piezoelectric materials, which demonstrated higher voltage output compared to PVDF [11]. The project successfully demonstrates electricity generation from footsteps using a prototype module. While the current module has limitations, scaling up with higher-rated devices and suitable gear mechanisms can produce significant energy. This eco-friendly technology has potential applications in powering street lights and other uses, particularly in high-traffic areas [12]. The Footstep Power Generation System harnesses energy from footsteps to generate electricity. The system uses a rack and pinion mechanism to convert pressure force into electrical energy. A spring assembly and chain sprocket mechanism transmit rotation to a dynamo, generating up to 24 volts. The system is reliable, economical, and eco-friendly, with no fuel input required [13]. The system utilizes piezoelectric sensors, a rack and pinion mechanism, and a dynamo to convert mechanical energy into electrical energy. The generated voltage is stored in a rechargeable battery and can power

AC and DC loads. The system is economical, eco-friendly, and suitable for crowded areas. The findings of this study can be applied to various fields, including renewable energy, mechanical engineering, and environmental science [14]. The importance of harnessing kinetic energy from vehicle suspension systems. They have explored the concept of power-generating shock absorbers, which can recycle wasted energy and improve vehicle efficiency. Researchers have also investigated the use of piezoelectric materials and regenerative braking systems to generate electricity. While challenges persist, the review suggests that power-generating shock absorbers can become a viable technology for vehicle industry, enhancing energy efficiency and reducing environmental impact[15]. The literature review highlights the potential of harnessing energy from human locomotion using piezoelectric sensors. They have explored the use of piezoelectric materials to generate electricity from footsteps, vibrations, and other mechanical stress. The piezoelectric sensors can convert mechanical energy into electrical energy. it also highlights the potential of using piezoelectric sensors to generate electricity in public places, such as railway stations, shopping malls, and temples, where large numbers of people walk[16]. It highlights the potential of footstep power generation as a sustainable and cost-effective alternative to traditional power sources. the performance of these systems, including energy output, efficiency, durability, and reliability. Factors affecting energy output, such as individual weight and footstep speed, have also been investigated [17]. This paper presents a footstep power generation system that converts mechanical energy from human footsteps into electrical energy. The system uses a rack and pinion arrangement, springs, a generator, and a battery. The proposed system is designed to be cost-effective, eco-friendly, and easy to install in public places. The system has the potential to reduce dependence on fossil fuels and contribute to a sustainable energy mix[18]. The authors have tested the system and found that it can generate a significant amount of energy from footsteps. The proposed system has the potential to provide a sustainable and renewable source of energy, particularly in areas with high foot traffic. The authors suggest that the system can be implemented in various locations, such as shopping malls, airports, and public parks [19]. This literature review highlights various studies on footstep power generation, focusing on converting wasted energy from human locomotion into electrical energy. Researchers have explored different mechanisms, including piezoelectric materials, rack and 12 pinion systems, and electromechanical generators. Studies have demonstrated the feasibility of generating electricity from footsteps, with some systems producing up to 1000 watts. It suggests that footstep power generation is a promising technology for harnessing renewable energy and promoting sustainability[20].The project successfully demonstrates electricity generation from footsteps using a prototype module. While the current module has limitations, scaling up with higher-rated devices and suitable gear mechanisms can produce significant energy. This eco-friendly technology has potential applications in powering street lights and other uses, particularly in high-traffic areas [12]. The Footstep Power Generation System harnesses energy from footsteps to generate electricity. The system uses a rack and pinion mechanism to convert pressure force into electrical energy. A spring assembly and chain sprocket mechanism transmit rotation to a dynamo, generating up to 24 volts. The system is reliable, economical, and eco-friendly, with no fuel input required [13]. The system utilizes piezoelectric sensors, a rack and pinion mechanism, and a dynamo to convert mechanical energy into electrical energy. The generated voltage is stored in a rechargeable battery and can power AC and DC loads. The system is economical, eco-friendly, and suitable for crowded areas. The findings of this study can be applied to various fields, including renewable energy, mechanical engineering, and environmental science [14]. The importance of harnessing kinetic energy from vehicle suspension systems. They have explored the concept of power-generating shock absorbers, which can recycle wasted energy and improve vehicle efficiency. Researchers have also investigated the use of piezoelectric materials and regenerative braking systems to generate electricity. While challenges persist, the review suggests that power-generating shock absorbers can become a viable technology for vehicle industry, enhancing energy efficiency and reducing environmental impact [15]. The literature review highlights the potential of harnessing energy from human locomotion

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CONCLUSION:

The footstep power generation system using a rack and pinion mechanism is a sustainable and innovative source of energy that has the potential to be integrated into public spaces, providing a reliable and renewable source of energy. The system successfully harnesses energy from footsteps and converts it into electrical energy. With further optimization and improvement, this technology can be integrated into public spaces, providing a reliable and renewable source of energy. The

system works by using a rack and pinion mechanism to convert the kinetic energy of footsteps into rotational energy. This rotational motion is then used to drive a generator, which produces electrical energy. The footstep power generation system using a rack and pinion mechanism has a number of advantages over other renewable energy sources. It is a clean and renewable source of energy that does not produce pollution. The system is still in its early stages of development, but it has the potential to become a major source of renewable energy in the future. With further research and development, the system could be made more efficient and cost-effective. In addition to the potential benefits of the footstep power generation system, there are also some challenges that need to be addressed. One challenge is the efficiency of the system. The current system is only able to convert a small percentage of the kinetic energy of footsteps into electrical energy. Another challenge is the cost of the system. The current system is relatively expensive to produce. In conclusion, the footstep power generation system using a rack and pinion mechanism is a sustainable and innovative source of energy that has the potential to be integrated into public spaces, providing a reliable and renewable source of energy. The system successfully harnesses energy from footsteps and converts it into electrical energy. With further optimization and improvement, this technology can be integrated into public spaces, providing a reliable and renewable source of energy.

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