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ENERGY HARVESTING WHILE WALKING

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Abstract:

This technology turns human movement into electricity using a novel "controlled slip" technique. It does this by fusing an innovative footstep technologies for energy conversion with piezo sensors. These under-the-plate sensors generate energy as a reaction to footfall, maximizing the voltage output. A circuit for monitoring microcontrollers records and determines the voltage furthermore, step count on the loaded platform.

Keywords — ArduinoUno , Lcd , Resistors , Peizo-electric sensor , Diode

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I. INTRODUCTION

The suggested apparatus aims to harness human movement as a power source using a revolutionary "controlled slip" technology. A complex footstep power production system with piezoelectric sensors is employed in this method. By generating energy in response to footsteps, these sensors increase the voltage produced when they are positioned thoughtfully underneath a platform. A monitoring circuit originating from a microcontroller detects and determines the voltage and step count on the plate that is weighted. The principal aim of this system's objective is to generate electricity by an unconventional means, i.e., by employing the simple motion of running or walking over footstep surfaces. Utilizing piezoelectric sensors, which are crucial to the utilization of an approach that produces power from human action. In conclusion, this model makes an endeavor to seize the momentum associated with human motion by utilizing a unique "controlled slip" technique. A sophisticated footstep-based power production gadget that uses piezo sensors is employed to seize the energy of a footstep. Strategically placed sensors beneath a platform to generate as much voltage as much as feasible in reaction to the quantity of footfall. The weighted dish is discovered by a monitoring circuit, which also counts steps and measures voltage.

II. RELATED WORKS

Development of energy-harvesting smart shoe technology that includes outdoor navigation Oluwadamilola Oshin, Simisola Sobowale, Oluyinka Oni and Aderemi Atayero Members, IAENG, IEEE
WCECS 2017, October 25-27, 2017, San Francisco, USA
The technology of the future is the smart system, which has an enormous range of uses. In this project, we offer a framework intended to enhance the convenience of outdoor navigation. A power gathering intelligent footwear is being created to enhance navigation and reduce people's dependence on maps— that is, the incessant need to refer to maps for guidance rather than focusing on the road. The central processing unit (CPU) of the undertaking is the Arduino UNO microcontroller.[1]

Rajendra prasad P , Avala bhanuja Power generation through footsteps using piezoelectric sensors along with gps tracking Rajendra prasad P, Avala bhanuja, Bhavani L, Bhoomika N, Bindu Srinivas
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Insufficient energy resources are available to support sustained expansion in the existing climate, and energy needs are increasing at a concerning rate. To meet demand, it is therefore essential to develop accessible, endless, and pollution-free energy sources. Since walking is a regular everyday human activity, they waste energy on the earth each time they move. We are using that, This energy may be transformed using the piezoelectric effect, into electrical energy for us to consume and conserve. When a piezoelectric sensor produces energy, it is AC voltage, which is generated through the piezoelectric action. [2]

Footstep power generation system Mansi C. Meshram , Manjusha B. Mehar , Ankita V. Koparkar , Shubham N. Suryawanshi , Prof. J. Shelke , Prof. S. Sahastrabudhey
Student, Department of E&TC Engineering, Priyadarshini J.L. College of Engineering, Nagpur, India. 45 Assistant Professor, Department of E&TC Engineering, Priyadarshini J.L. College of Engineering, Nagpur, India
Access to power is a requirement for modern existence.. Numerous tasks require a substantial amount of electricity. The quantity of energy consumed worldwide has increased, and conventional electricity production techniques have an adverse impact on the surroundings. The primary impediment to development in both in both industrial and rural regions is energy constraint. Outages of power can affect India's growth and progress. Strong methods for producing electricity utilising human energy, which hasn't been used for millions of years, are being created to deal with these issues. The conventional method of generating electricity has an impact on the environment.[3]

Generation and utilization of electricity using footsteps as a source of energy Sarala T , Shivashankar, Poornima M ,Lekkhana H D
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Insufficient energy resources are available to support sustained expansion in the existing climate, and Energy requirements are increasing at a concerning rate. To meet demand, it is therefore essential to develop accessible, endless, and pollution-free energy sources. Since walking is a regular everyday human activity, they waste energy on the earth each time they move.We are utilizing a tool that can use the ability to maintain and utilize this energy by converting it into electrical energy through the piezoelectric effect.When a piezoelectric sensor produces energy, it is AC voltage, which is generated through the piezoelectric action.[4]

Energy Harvesting using Piezoelectric Transducers Nilimamayee Samal and O. Jeba Shiney
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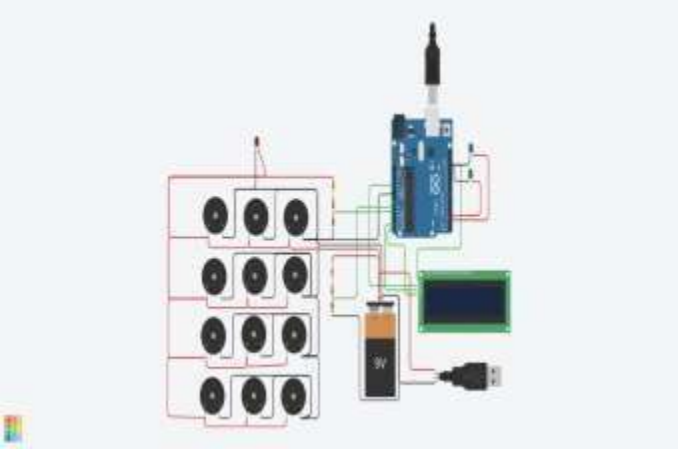
Systems for Harvesting Energy (EHS) of several varieties been developed to handle the growing demand for electricity. Piezoelectric transducers can be used to harvest energy from underutilized renewable natural sources is one method of doing this. Every day, a range of models for analysis utilizing different types of piezoelectric transducers published in an endeavor to increase the output power additionally energy harvesting efficiency systems. Over the previous ten years, PEH devices that harvest piezoelectric energy been created to collect the energy required for small electronics. This essay examines these frameworks. [5]

III. METHODOLOGY:

The methods listed below are what we make use of to accomplish the work's objectives:
Methodology-1: This model offers walking by having people sliding around under control. Footsteps utilizing piezoelectric sensors. The voltage additionally step using following.
Methodology-2: The energy produced by walking that is produced by humans is kept and utilized as fuel low-power electronics.

IV. DESIGN



The process involves the following steps:

1. To guarantee that maximize current production and output, several arrangements and materials were investigated throughout the creation of diverse piezoelectric sensors. To guarantee that increase output, the connections between several piezoelectric plates were changed from sequential to parallel.
2. Various materials, including wooden plates and fiberglass An evaluation of the subjects' ability to generate power was conducted. Throughout this investigation, several essential functions for the system's operation were coordinated and managed using the highly versatile Arduino UNO microcontroller.
3. This study's main goal was to investigate the various contexts in which piezoelectric sensors might be used and optimized. In industries like wearable technology, robotics, and smart infrastructure, creative and sustainable energy harvesting solutions may be made possible by this research on piezoelectric sensors.
4. To sum up, the research on piezoelectric sensors included looking at different setups, materials, and a programmable microcontroller to research possible uses and improvements. This study may open up new avenues for sustainable power generation and energy collection. - Test the system under various conditions to ensure reliability and security.

V. CONCLUSIONS

Energy harvesting while walking has enormous potential for long-term power generation and has attracted a lot of interest since its ability to harness human motion, a readily available resource. Through various technologies like piezoelectric Footstep kinetic energy can be transformed into electrical energy. This has advantageous effects for powering wearable devices, sensors, and even contributing to the grid in urban environments. In conclusion, energy harvesting while walking presents a compelling avenue for both individual and societal benefits. It not only offers a renewable and eco friendly energy source but also promotes innovation in wearable technology and smart infrastructure. As research and advancement in this field continue to advance, the integration of systems that gather energy into everyday activities could contribute significantly to our quest for sustainable energy solutions.

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[3]. WCECS 2017, October 25-27, 2017, San Francisco, USA Oluwadamilola Oshin, Simisola Sobowale, Oluyinka Oni and Aderemi Atayero Members, IAENG

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