(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :08/08/2024

(21) Application No.202441059928 A

(43) Publication Date : 16/08/2024

(54) Title of the invention : FOOT STEP POWER GENERATION

(51) International classification :H02N0002180000, H10N0030300000, G06F0030200000, H02J0007350000, G06Q0010063700

(86) International Application No :NA
Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA
Filing Date :NA

(62) Divisional to Application Number :NA
Filing Date :NA

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(57) Abstract :

Footstep power generation is an innovative and sustainable approach to harnessing energy from human movement. This project explores the design and implementation of a system that converts the mechanical energy generated by footsteps into electrical energy. The system utilizes piezoelectric materials, which generate an electric charge when subjected to mechanical stress. As individuals walk over the embedded piezoelectric sensors,the pressure exerted is converted into electrical energy, which is then stored in batteries for future use. The objective of this project is to develop a cost-effective and efficient energy-harvesting solution that can be integrated into high-footfall areas such as sidewalks, shopping malls, and public transportation hubs. The design process includes selecting appropriate piezoelectric materials, optimizing the sensor layout, and integrating a power management system to maximize energy storage and utilization. Experimental results demonstrate the feasibility of generating significant electrical power from footsteps,contributing to the reduction of reliance on traditional energy sources and promoting green energy solutions.This technology has the potential to power low-energy devices and contribute to smart city initiatives byproviding a renewable energy source that leverages everyday human activity. The successful implementation of footstep power generation systems can pave the way for sustainable energy solutions in urban environments,enhancing both energy efficiency and environmental conservation.

No. of Pages : 7 No. of Claims : 3