Patent Search

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Abstract:

The present invention relates to a system and method for generating electrical energy frommechanicaldisplacementcausedbyvehicularmovementorhumanfootsteps overaspeciallydesignedspeedbreakerorfootstepmechanism.Theappliedload produces linear motion, which is converted into rotational motion using a rack-and- pinio transmission arrangement. The rotational energy drives a permanent magnet DC generator to produce approximately 12V DC electrical output. Thegenerated power rechargeable battery and converted into 230V AC using an inverter to operate electrical loads such as lights and fans. The system further incorporates data acquisitio monitoring features to measure voltage, current, and power generation parameters. The collected data is analyzed and visualized usingPower BI for performance eva energy trend analysis, and system optimization. The invention provides a compact, sustainable, and smart energy harvesting solution suitable for urban infrastructur city applications.

Complete Specification

Description:The invention consists of a power generation system installed beneath a footstep or speed breaker arrangement. An inclined L-shaped movable plate is at a small angle on the surface. When a person steps on it or a vehicle passes over it, the applied force causes vertical movement of the plate.

This linear motion is converted into rotational motion using a rack-and-pinion mechanism. A spring arrangement restores the plate to its original position after thel removed, enabling continuous operation. The pinion shaft is connected to alarger sprocket, which transfers motion through a chain drive to a smaller sprocket, ens unidirectional rotation similar to a bicycle mechanism.

Aflywheel andgeararrangementincreasetherotationalspeedandtransmitmotionto a permanent magnet DC generator, producing approximately 12V DC. The generat powerisstoredina12Vlead-acidbattery.An inverterconvertsthestored12VDC into 230V AC to operate loads such as lights and fans.

The system is installed below floor level for safety and durability. Additionally, electrical parameters are monitored and analyzed using Power BI for performance ev and energy management.
, Claims:1. A system for generating electrical energy from mechanical displacement, comprising a movable speed breaker or footstep plate configured to convert vehicular or human load into linear mechanical motion.
2. The system as claimed in claim 1, wherein the linear motion is converted into rotational motionthrougha rack-and-pinion mechanism coupled witha gear and s

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