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Patent Search

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Abstract:

The present disclosure relates to systems and methods, and provides a Gear Based Mechanical System for a spring-powered compound gear energy generation system configured to accumulate mechanical energy through human input and convert it into electrical energy via a compound gear arrangement. The spring-powered compound gear energy generation system (100) includes an input key (102) operatively coupled to a primary gear (104), and a torsion spring (106) coupled to the primary gear (104). The spring-powered compound gear energy generation system (100) is configured to accumulate mechanical energy through human input and convert it into electrical energy via a compound gear arrangement in response to user turning of the input key (102). This configuration achieves generation of electric current usable in powering electric

Complete Specification

Description: TECHNICAL FIELD

[001] The present invention relates to the technical field of mechanical energy conversion and sustainable power generation technologies, and more particularly to a Gear Based Mechanical System configured to convert mechanically stored spring energy into electrical energy through a compound gear arrangement.

BACKGROUND

[002] The field of mechanical energy conversion for sustainable power generation has seen significant development in recent years, driven by a growing demand for reliable, low-cost, and environmentally responsible alternatives to conventional fossil-fuel-based systems. Technologies harnessing solar radiation, wind, and hydro have achieved commercial maturity; however, these resources typically require specific geographic conditions, infrastructure investments, and continuous environmental inputs that may not be universally available. As a result, there remains sustained research interest in systems capable of capturing and converting energy derived from human mechanical effort or small-scale mechanical sources into usable electrical power.

[003] Conventional mechanical-to-electrical energy conversion devices typically rely on continuous rotary input delivered at sufficient speed to drive an electrical generator directly. In practice, human-generated or manually coupled mechanical inputs are characteristically low in speed and variable in torque, rendering them poorly matched to the speed requirements of conventional generator systems. Devices that attempt direct coupling of manual mechanical effort to a generator shaft may suffer from input speed and inadequate torque transformation, resulting in insufficient rotational velocity at the generator and correspondingly poor electrical output.

[004] To address speed and torque mismatches, gear-based transmission systems have been employed in certain mechanical energy conversion configurations. However, arrangements relying on simple gear pairs or single-stage transmissions may provide only limited speed multiplication ratios, constraining the achievable generator

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