

1. Title of proposed idea/innovation:

SPROCKET GEAR SOLAR TRACKING (SGST)

2. Briefly explain newness/uniqueness of the innovation

Unmet Need:

The unmet needs of a gear solar panel system (involving a solar panel combined with a gear system, like solar trackers) could revolve around several challenges and opportunities for improvement.

Uniqueness:

The uniqueness of a gear-based solar panel system, particularly one that uses gears in solar trackers, can be highlighted in several ways like Dynamic Energy Optimization, Durability in Harsh Conditions, Adaptability to Multi-Axis Tracking.

Novelty :

Gear-based solar panel system, especially in modern applications, can be described in terms of innovations and unique advancements in its design and function. Advanced Solar Tracking Algorithms, Integrating smart technologies like AI-driven algorithms with gear mechanisms allows for real-time tracking of the sun, improving energy efficiency and adapting to environmental changes (e.g., clouds or shading) more intelligently than traditional systems. Self-Lubricating Gears, The innovation of self-lubricating materials for gears in solar trackers eliminates the need for regular maintenance, making the system more sustainable and reducing long-term operational costs.

Product Developed :

The Sprocket gear solar Tracking (SGST) is an advanced solar energy solution designed to maximize energy capture through innovative gear mechanisms and smart technology integration. It provides efficient solar tracking capabilities while minimizing maintenance and operational costs..

3. Concept & Objective

Concept :

- The Sprocket gear solar tracking (SGST) is designed to enhance solar energy efficiency by integrating advanced gear mechanisms and intelligent technology.
- The concept revolves around creating a solar tracking system that dynamically adjusts the orientation of solar panels to follow the sun's movement, thereby maximizing energy capture throughout the day.
- The SGST aims to provide a reliable, cost-effective, and user-friendly solar solution suitable for various applications, from residential to commercial.

Objectives :

- Maximize Energy Production.
- Reduce Maintenance Requirements.
- Incorporate Smart Technology.
- Facilitate Easy Installation and Scalability.

4. Specify the potential areas of application in industry/market in brief.

User Survey:

- Agriculture, Farms can utilize SGST systems to power irrigation systems or agricultural operations, ensuring reliable energy supply while simultaneously promoting renewable energy use.
- Electric Vehicle Charging Stations, SGSTs can be integrated into solar-powered EV charging stations, providing clean energy for charging while reducing operating costs.
- Residential Solar Installations, Homeowners can install SGST systems to maximize energy production from rooftop solar panels, leading to reduced electricity bills and increased energy independence.

Opportunity :

- Area of Focus: Germany, United States As a pioneer in renewable energy, Germany continues to promote solar energy adoption. The government offers incentives for solar installations, driving interest in more efficient technologies such as solar trackers.
- Who would want this: Homeowners, Small and Medium-Sized Enterprises (SMEs), Large Corporations, Agricultural Sector Farmers Agricultural producers looking to power irrigation systems, greenhouses, or farm operations sustainably and reduce reliance on traditional energy sources
- Growth Opportunities: Rising Demand for Renewable Energy, Government Incentives and Support.

Value Proportion :

- Maximized Energy Production.
- Cost Savings: Users can benefit from significantly lower electricity bills and faster return on investment due to the enhanced efficiency of solar energy generation.
- Longevity & Efficiency: Go-to testing results in direct power distribution, preventing constant charging and thereby providing battery longevity.
- Low Maintenance: Designed for durability and minimal upkeep, SGST allows users to enjoy hassle-free operation over the long term.

5. Briefly provide the market potential of idea/innovation.

- The global shift towards renewable energy sources is accelerating, with increasing government and corporate commitments to reduce carbon emissions. This trend fuels demand for efficient solar solutions like solar trackers.
- Rising Solar Installations: solar energy market is expanding rapidly, with millions of new solar installations expected in

residential, commercial, and industrial sectors. Solar trackers can enhance the efficiency of these systems, attracting more customers.

6. Block diagram / Flow chart

