



Industrial Consultancy & Sponsored Research (IC&SR)

Solar parabolic trough collector with integrated torque tube – box support structure

IITM Technology Available for Licensing

Problem Statement

- ❑ The problem statement discussed in the present invention is *how to develop an improved solar parabolic trough collector system with reduced thickness and reduction of overall module weight including other features.*
- ❑ Hence, subject invention addresses the issue efficiently

Technology Category/ Market

Technology: Solar parabolic trough collector

Industry/Application: Energy, Infrastructure, Clean Energy;

Market: The global parabolic trough concentrated solar market is projected to reach at a **CAGR** of **2.06%** during the period (2024-28).

Technology

- ❑ Present patent describes **solar parabolic trough collector** with modified torque tube box support structure.
- ❑ The collector is having a **circular tube**, plurality of mirror arms and supported by pylons and hydraulic tracking system characterized in the combination of
 - an **internal torque tube** means inserted inside the circular tube;
 - An **external torque box** means surrounding the torque tube means.
- ❑ Facilitates the **solar parabolic trough collector with external rhombus truss structure.**
- ❑ The torque tube has a trapezoidal section that increases the bending strength which in turn **increases the module length**, thereby

reduces the number of **supports** and **foundation** in between each module.

- ❑ The truss structure surrounding the torque tube is arranged **symmetrically** from both the ends so that the bending and torsional forces acting are in **balance.**
- ❑ Both the ends of the **torque tube** are provided with end plates & these members give connection to the bearing support for attaching pylon.

Key Features / Value Proposition

- ❑ Achieve a solar parabolic trough collector with **optimized structural components** with **reduced number of members** resulting in **weight reduction.**
- ❑ The system consists of an **internal torque tube** within a **circular tube** and also an **external torque box** surrounding the torque tube which ensures **high bending capacity** and increased torsional rigidity with **least material consumption.**
- ❑ Facilitates **cost-effective & efficient system.**

TRL (Technology Readiness Level)

TRL-3, Technology proof of concept stage

Intellectual Property

IITM IDF Ref. 978; Patent No. 343821

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