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(57) Abstract :
 META MINDS: AUTOMATED SOLAR PANEL CLEANING SYSTEM WITH ROLLING AND ADAPTIVE CLEANING MECHANISMS ABSTRACT The present invention introduces an efficient, automated solution to maintaining solar panel performance by addressing the accumulation of dust, dirt, and environmental contaminants. The system features a rolling mechanism, driven by cylindrical rollers, that moves across the solar panel surface, integrated with soft brushes or cleaning pads to remove debris without damaging the panels. It includes an ultrasonic sensor to maintain a fixed distance from the panels, a motor driver to control speed and direction, and a water spraying system to enhance cleaning. The system automates the cleaning process, reducing manual labor and ensuring optimal energy output. Additionally, it supports large-scale installations with gear motors for movement across multiple panels. The method claims cover the operation and automation of the cleaning process, enabling effective, low-maintenance solar energy generation. This innovation promotes sustainable, cost-efficient solar power usage while preserving panel longevity.

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