IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 4, May 2022
Impact Factor: 6.252

Design and Development of Solar Panel Cleaning Robot

Prof. Vijaya Avati[1], Sohilkhan Pathan[2], Akshay Nanaware[3], Tushar Bhapkar[4], Prasad Ranpise[5]
Faculty, Department of Mechanical Engineering[1,]
Student, Department of Mechanical Engineering[2,3,4,5]
JSPM's Jayawantrao Sawant College of Engineering, Pune, Maharashtra, India

Abstract: *Energy is one of the major issues that the we are facing in India, the supply of energy has been one of the major problems for both urban and rural household about 60% to 70% of the energy demand of the country is met by fuel wood and agriculture residues. Solar energy is a renewable source of energy, which has a great potential and it is radiated by the sun. Renewable energy is important to replace the using of electric energy generated by petroleum. Solar power has become a source of renewable energy and solar energy application should be enhanced. The solar PV modules are generally employed in dusty environments which are the case tropical countries like India. The dust gets accumulated on the front surface of the module and blocks the incident light from the sun. It reduces the power generation capacity of the module. The power output reduces as much as by 50% if the module is not cleaned for a month. The cleaning system has been designed cleans the module by controlling the Arduino programming. To remove the dust in the PV modules to improving the power efficiency.*

Keywords: PV panels, Rolling brush, Arduino board, DC Gear motor, Gear wheels

REFERENCES

[1]. M. F. Yaakub, et al., "Prospective study of power generation from natural resources using hybrid system for remote area," Indonesian Journal of Electrical Engineering and Computer Science, vol. 18, no. 2, pp. 642-647, 2020.
[2]. S. R. Hunter, et al., "Low-cost anti-soiling coatings for CSP collector mirrors and heliostats," High Low Concentrator Systems for Solar Energy Applications IX, vol. 9175, p. 91750J, 2014.
[3]. M. A. Bahattab, et al., "Anti-soiling surfaces for PV applications prepared by sol-gel processing: Comparison of laboratory testing and outdoor exposure," Solar Energy Materials and Solar Cells, vol. 157, pp. 422-428, 2016.
[4]. Y. Y. Quan and L. Z. Zhang, "Experimental investigation of the anti-dust effect of transparent hydrophobic coatings applied for solar cell covering glass," Solar Energy Materials and Solar Cells, vol. 160, pp. 382-389, 2017.
[5]. M. Sakhuja, et al., "Outdoor performance and durability testing of antireflecting and self-cleaning glass for photovoltaic applications," Solar Energy, vol. 110, pp. 231-238, 2014.
[6]. Q. F. Xu, et al., "An Anti-Reflective and Anti-Soiling Coating for Photovoltaic Panels College of Staten Island and Graduate Center of the City University of New York," in Advanced Materials: TechConnect Briffs 2015, pp. 624-627, 2015.
[7]. K. Midtdal and B. P. Jelle, "Self-cleaning glazing products: A state-of-the-art review and future research pathways," Solar Energy Materials and Solar Cells, vol. 109, pp. 126-141, 2013.
[8]. L. Yao and J. He, "Recent progress in antireflection and self-cleaning technology - From surface engineering to functional surfaces," Progress in Materials Science, vol. 61, pp. 94-143, 2014.
[9]. G. Webster, "Spirit Gets Energy Boost from Cleaner Solar Panels," Jet Propulsion Laboratory, Pasadena, Calif., 2009. Available: https://www.nasa.gov/mission_pages/mer/news/mer-20090212.html.
[10]. Washpanel s.r.l., "Portable system device/reference for solar field/flat roof/shed," 2013. Available: http://www.washpanel.com/en/documenti.php.