International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 04 | Apr 2019 www.irjet.net p-ISSN: 2395-0072

Design and Analysis of Integrated Solar Panel Cleaning System

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Abstract: – *This project is developed for the solar system users.the dust gets accumulated on the front surface of the panel and block the incident light from the sun.it reduces the power generation capacity of the module.We providing transparency in Cleaning system by the newly invented technology,which provided better performance, consistency.we provide cleaning mechanism for costumers. Cleaning the PV panel using the developed water system and minimizes the amount of water needed for cleaning.*

Keywords: Solar Panel, Cleaning, Water Spray, Wiper, Battery, Side shaft motor, etc…

1. INTRODUCTION

Today, most of the industrial application use the solar panels as an electrical power source instead of relying on the generators or the ordinary source for electricity. Cleaning of solar panel is done by manual washing which is expensive and more time consuming. The research stuied the effect of dust on solar panel is decreasing the output of the PV power plant.it reduce the power generation capacity of the module. The power output reduce as much as by 50% if the module is not cleaned for a month.

2. METHODS AND MATERIALS

The cleaning wiper moves on the surface part of the solar panel in a forward and backward motion. When switch is on then arduino circuit output given thought driver circuit to motor which runs in a forward direction.as soon as the motor start moving,the pump get in working mode and the spraying action starts. Wiper is mounted with belt which is guide by a timimg pulley.in entire time of moving forward path,water spread on the solar panel and it's force to dust move in the direction of wiper motion and wiper clean the panel.after reaching edge of panel,according to arduino coding motor start to rotate in anticlockwise direction.when motor is moving revers direction the water pump gets off and the action of water spray is stop.wiper comes to the initial position and complete to one cycle and process to be stop.

Figure.2.1: Whole System (top view)

Figure.2.2: Whole System (side view)

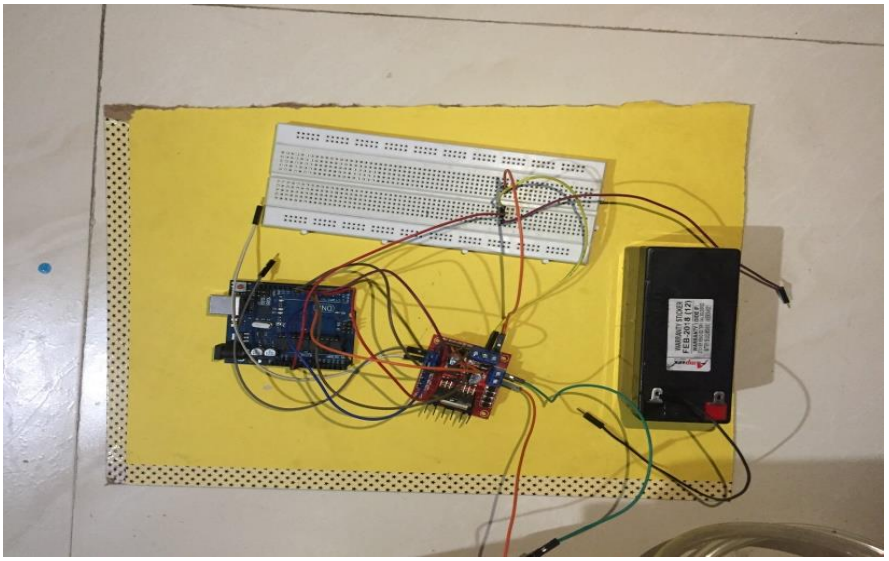

Figure.2.2: Arduino with driver Circuit

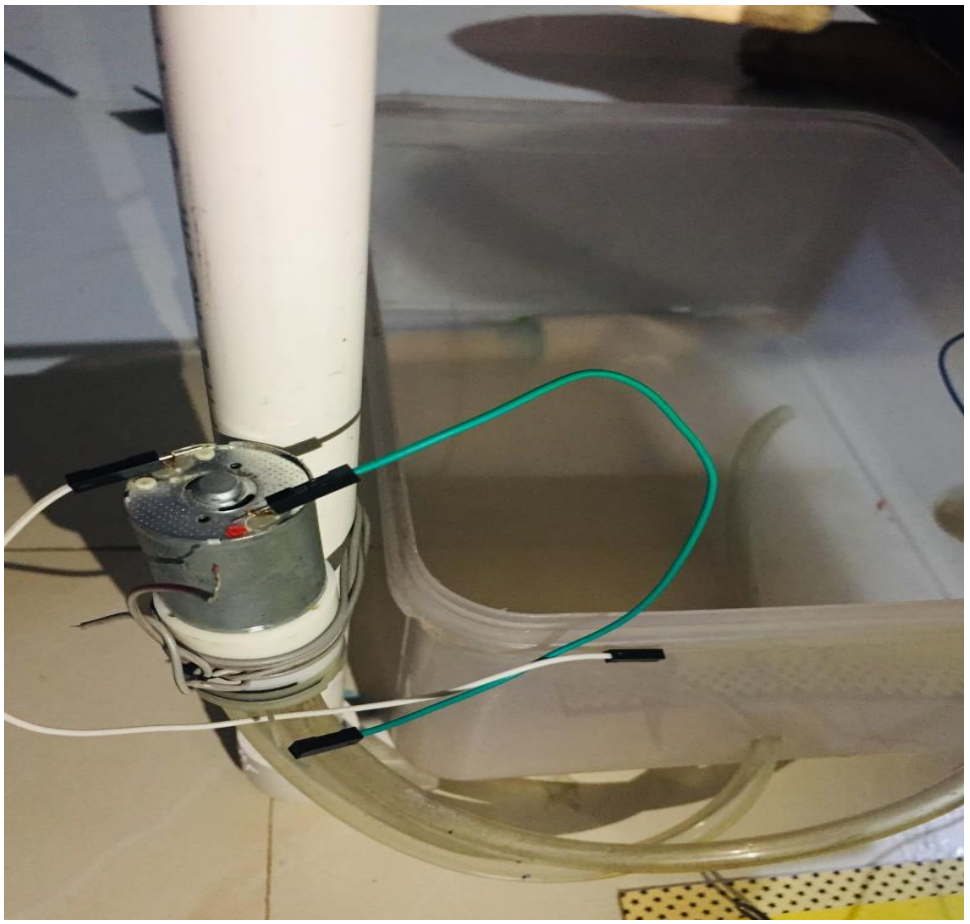

Figure.2.3: Water Pump

3. RESULTS AND DISCUSSION

To increases output power after cleaning a solar panel by water spray with using rubber wiper. Dry cleaning is not able to clean birds drop and other hard particles. Dry cleaning is only able to remove upper layer. In this system rechargeable battery is used. So it is recharge directly from solar panel. This integrated system are made up of light weight material. So no more weight laying on panel. Water is decreses to tempreture of panel during cleaning.

4. CONCLUSION

In conclusion we can see the system working properly and we can get proper solar panel cleaning. In future this system is also operating by a timing circuit which is working in particular time period. This integrated system is suilable to installed in residential rooftop, solar farm. No man work inference in cleaning so cost of cleaning is less.

5. FUTURE SCOPE OF PROJECT

We can modified to wi-fi connected system so it is possible to start cleaning from anywhere.

Sensor system providing to sense dust on solar panel and weather.so ti will start automatically according to contains of dust.

To improve in belt-pulley mechanism in which wiper will go under the solar panel. so, tempreture is not affect to it.

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