Solar photovoltaic array surface cleaning device and control means

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Abstract: Solar photovoltaic array surface cleaning device and control means was presented in this paper. The cleaning device for photovoltaic panels surface which coating self-cleaning film. It was slider hollow tubes with many holes which droved by the high-pressure pump. It was fixed on two unidirectional damping rails completely. The control means used a timer switch to control the high pressure pump. It could completely integrate whole control system which could set and adjust different cleaning times according to different regions, different season and different weather. This design significantly reduced installation costs and maintenance costs.

Key Words: Solar photovoltaic array; surface cleaning; high-pressure pump; control mean; timer switch.

1 INTRODUCTION

In the western region of our country has a long time of sunshine and the vast land, but the Northwest climate dry, windy, sandy, and less rainfall, it is easy to photovoltaic array caused by pollution, solar panels surface is very easy to dust deposition. At present, the artificial cleaning efficiency is low, the cost is high, and the promotion of solar energy.With the development of robot technology, cleaning robot has been formed in various industries, the combination of solar energy technology and clean robot technology has become the inevitable future PV industry.

2 CONTROL METHOD

Cleaning robot specific work process: start the timer switch, high pressure pump began to work through a spring hose to a clean slide bar to inflation, under the impact of high pressure gas emitted from the mouth of the high pressure gas cleaning of photovoltaic plate surface, also jet nozzle and the photovoltaic panels for 60 degree angle from the surface, to move the one-way damping sliding rail at high pressure gas reaction under the action of. Because the one-way damping sliding rail to no resistance, clean the slide bar can be easily to move up because of the downward damping effect, clean slide bar will not fall, damping effect of the damping rod can support clean rod continued to move on. In motion to photovoltaic panels of the top clean of photovoltaic panels, end of power, in the damping effect of the one-way damping sliding rail, clean slide bar to slow down, bar cleaning brush also secondary cleaning of photovoltaic plate surface.

3 BRIEF DESCRIPTION

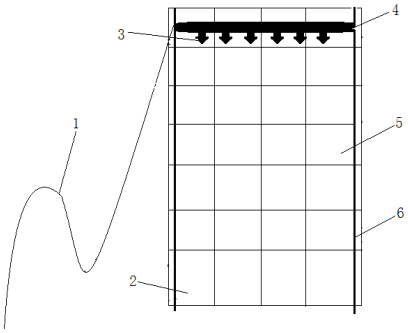

Figure 1 is a schematic diagram of utility model cleaning apparatus;

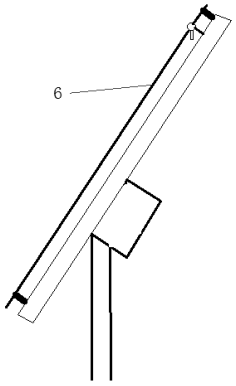

Figure 2 is a cleaning device of the utility model left view;

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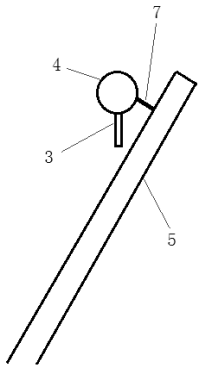

Figure 3 is an enlarged view of new clean utility device;
FIG. 1, the spring hose, 2, self-cleaning film, 3, jet nozzles, 4, clean slide bars, 5 sun
Photovoltaic panels, 6, unidirectional damping rails, 7, cleaning brush,

4 THE CONCLUSION

The design of solar photovoltaic array surface cleaning robot was very simple and convenient. The control means, time control device according to different regions, different season and different weather set different cleaning time, improve the efficiency of solar photovoltaic array, and reduce the cost. And accurate control, saving manpower to monitor, independent of the cleaning work of solar photovoltaic panels, advanced gas jet cleaning, cleaning brush, cleaning efficiency is greatly improved, the realization of the automatic control. The cleaning robot could energy saving and environmental protection and in accordance with the geographical environment in the western region in our country.

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