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DEVICE FOR AUTOMATIC SOLAR PANEL CLEANING

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This invention relates to automatic solar panel cleaning systems . A solar cell cleaning device that includes a power source connected to the solar cell, pollution control sensors, and wires located on the surface of the solar panel is characterized by the fact that the wires are made to vibrate and are connected together in a grid. An automated solar panel cleaning method has also been proposed. The invention provides effective cleaning of the surface of the solar cell from snow, ice, debris and other objects that interfere with the conversion of solar energy.
Currently, the Earth's resources are running out, the environment is deteriorating every year, and modern energy sources contribute to this. Solar energy is a modern and effective alternative method of electricity production , which is evaluated by the very low prices compared to traditional energy types . Placing solar panels several kilometers above the ground in mountainous areas increases the flow of solar radiation , but complicates the maintenance and cleaning of solar panels. Therefore, creating an automated system for cleaning solar cells is an urgent task.
the currently known system for solar cell cleaning are its large size and impossibility of use in winter due to low temperatures and possible freezing. In addition, the use of a protective panel prevents the passage of solar radiation, thereby reducing the efficiency of the entire system. Another disadvantage of these devices is the presence of additional pumps that require powerful energy sources, as well as the need to use cleaning agents.
An air blower (compressor) for cleaning solar panels consists of two rollers, one of which mechanically cleans the surface of the solar panel, and the second roller statically attracts the remaining dust particles. The movement of the device is carried out along the entire linear row of panels along the installed surface. The device is operated by energy from the battery.
The purpose of the invention is to automate the process of cleaning solar panels, regardless of temperature and weather conditions, and regardless of the absence of maintenance personnel, as well as the possibility of installing and using this system on existing solar panels.
The technical result is to effectively clean the surface of the solar cell from snow, ice, debris and other objects that interfere with the conversion of solar energy. In the solar cell cleaning device, which has a power source connected to the solar cell, pollution monitoring sensors and wires located on the surface of the solar cell according to the invention, the wires are made to vibrate and are connected to each other in the form of a grid mounted on the surface of the solar panel, and an alternating current source is used as a power source. and produced in the form of pollution control sensors.

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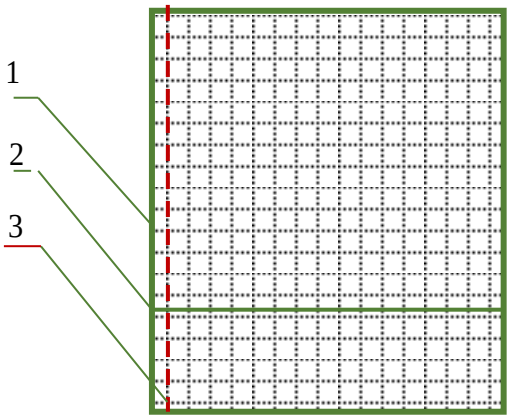

Figure 1

The technical description of the invention is illustrated by drawings . Figure 1 shows the solar panel cleaning system . Figure 2 shows a general view of a solar cell with a purification system. The device for automated cleaning of the solar cell (Fig. 1) includes wires 1 and 2, which are twisted together and installed on the solar cell (Fig. 2), on which wire voltage sensors 3 (Fig. 1) are installed. The alternating current source is installed in 4 housings and placed under the panel (Fig. 2).

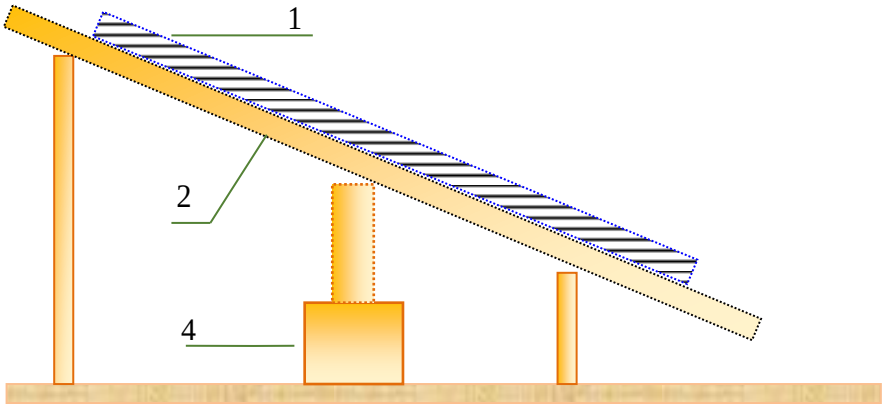

Figure 2

The automated solar panel cleaning device works as follows: when winter precipitation is detected by wire tension sensors 3, alternating current is supplied to the wires so that the wires (horizontal and vertical) have the same natural vibration frequency; in this condition, a mechanical resonance phenomenon occurs , in which the resulting vibration of the wires

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breaks the ice and cleans the solar panel, and due to the heating of the wires, the melted snow falls down the slope of the solar panel.

An example of a particular implementation of the method

was installed on the window panel to clean it ; when the surface of the solar panel freezes, the sensors register the voltage of the wires and activate the cleaning system. An alternating current of 0.3 A passing through the wires causes them to oscillate, because the wires have the same natural frequency of oscillation. During the vibration of the wires at the maximum value of the vibration amplitude, a mechanical resonance phenomenon occurs, in which the vibration of the wires breaks the ice, and therefore the ice pieces come out of the panel.

Thus, the present invention automates the process of cleaning solar panels, regardless of temperature and weather conditions, and regardless of the absence of maintenance personnel, and also allows this system to be installed and used on existing solar panels. As a result, the efficiency of cleaning the surface of the solar cell from snow, ice, debris and other objects that interfere with the conversion of solar energy increases.