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PROSPECTIVE WAYS OF SELF-DRAINING HELIO STRUCTURES IN THE USE OF SOLAR ENERGY

Annotation: *Instead of multi-circuit costly systems, the development of simple single-circuit energy-saving and reliable self-draining solar devices with high capacity, the use of modern energy-saving and energy-saving technologies of solar energy.*

Keywords: *Solar collector, energy, power, renewable, heat carrier, heating water, drain back system.*

ПЕРСПЕКТИВНЫЕ СПОСОБЫ САМОСТОЯТЕЛЬНОЙ ГЕЛИОСТРУКТУРЫ ПРИ ИСПОЛЬЗОВАНИИ СОЛНЕЧНОЙ ЭНЕРГИИ

Аннотация: *Вместо многоконтурных дорогостоящих систем, разработка простых одноконтурных энергосберегающих и надежных самоосушающихся солнечных устройств большой емкости, использование современных энергосберегающих и энергосберегающих технологий солнечной энергетики.*

Ключевые слова: *солнечный коллектор, энергия, мощность, возобновляемые источники, теплоноситель, вода для подогрева, система отвода воды.*

Introduction.

Improving the efficiency of the use of solar energy sources and improving their devices based on them is becoming a requirement of the times. Today, a number of positive results are being achieved in the use of these renewable solar energy sources. The production of devices that generate heat and electricity

using solar energy, which is an alternative to energy sources - single and double circuit water heaters, photovoltaic devices.

Methods of research.

Due to the rising cost of traditional energy carriers, the focus on the use of solar energy is increasing again. At the same time, a new interest in solar systems for heating and hot water supply is developing[1]The declining and increasing cost of fossil fuels and the environmental problems that arise when power plants run on fossil fuels, the use of renewable solar energy, which is one of the natural energy-saving resources, is a pressing issue that needs to be addressed today. To increase the practical use of solar energy for hot water supply and heating of various facilities, instead of expensive multi-circuit systems that use non-freezing liquids (antifreeze) to protect solar collectors from damage in winter and summer, high-capacity simple single-circuit energy-saving and reliable self - raises the issue of development of self-draining solar devices. Solar collectors are a key element of aquatic solar heat supply systems and operate under conditions of extremely variable sources of solar energy and outdoor air temperature in a very wide range: from low negative values in winter to high positive values in summer. Such operating conditions can cause solar collectors to fail: in winter as a result of freezing of water at night, and in summer - as a result of boiling water in stagnation mode (when circulation stops) and the temperature inside solar collectors rises to 200oS in flat collectors and 300oC in vacuum.

The use of antifreeze in high-capacity solar devices is a very expensive solution due to the large area of solar collectors, moreover, this solution does not solve the problem of summer protection of solar collectors due to boiling antifreeze in the summer[2].

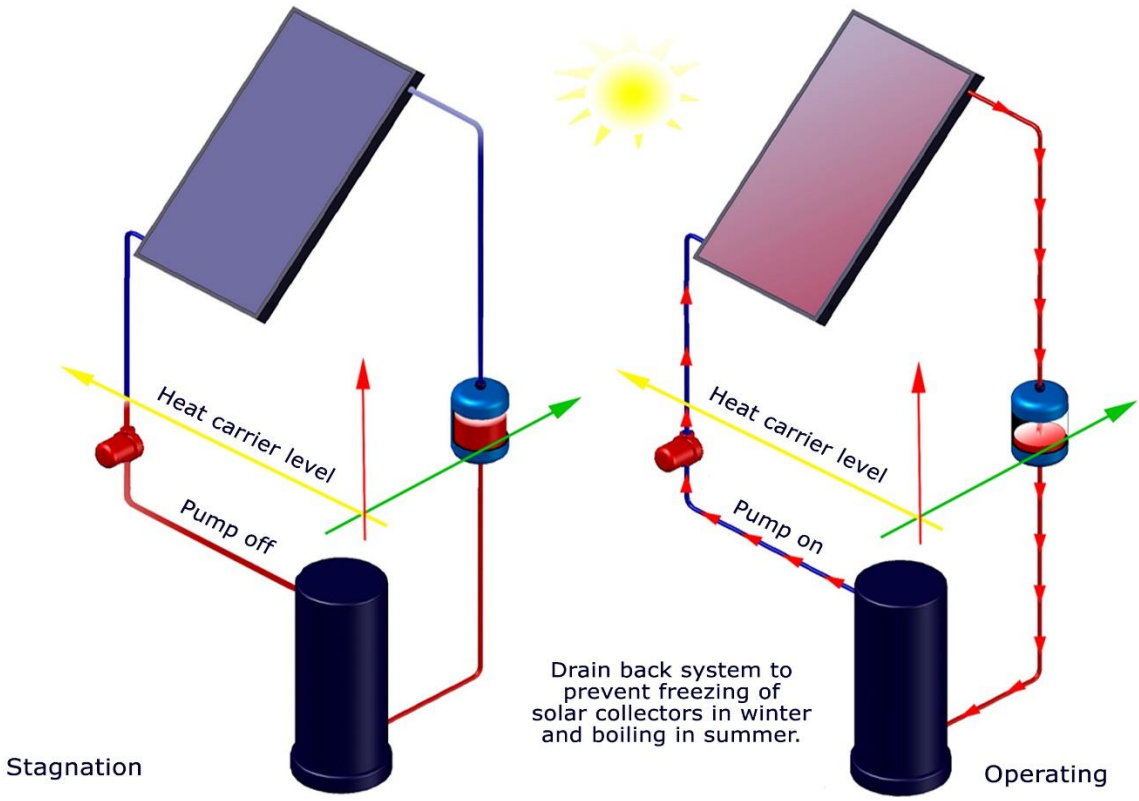

Figure 1. Method of drain back solar collectors.

Results

In self-draining solar installations, the solar collectors are protected from damage due to the fact that there is complete drainage when the circulation pump stops in both winter and summer seasons. However, certain solutions of self-draining solar devices, which are widely used in world practice, include excessive consumption of electricity to circulate the heat carrier, hydraulic shocks when circulating pumps stop, low reliability and large loss of temperature potential in intermediate heat exchangers[3].

Self-draining solar devices are relatively energy-efficient and reliable self-draining solar devices with a simple single-circuit high-power solar system that reduces electricity consumption by up to 60%, avoids hydraulic shocks when circulating pumps stop, and increases thermal efficiency by up to 20%. focused on output and implementation. Self-draining solar devices are related to the priorities of scientific research in the country and government programs or research plans. Nowadays, one of the alternative solutions to these problems is

the reduction of fuel reserves and the increase in the cost, the efficient and rationally organized heat supply at the expense of solar energy sources, the reduction of energy and fuel supply.

The involvement of solar energy species in the energy balance and the use of solar energy in the first place is of great scientific and practical interest. In the republics of Central Asia, the use of environmentally friendly solar energy, which comes in almost all year round, is especially important for heating systems. Much attention is paid to research on the use of solar energy.

Conclusion

The reason is the growing demand for electricity and heat, which is a pressing problem in our country and around the world. This can be attributed to a variety of factors, such as declining conventional energy fossil fuels, increasing their cost, degrading the environment, and so on. [4]Consistent implementation of measures to improve the quality and continuity of heat supply to consumers, renewal and modernization of fixed assets of the heat supply system based on the introduction of modern energy-saving and energy-saving technologies, efficient and rational use of fuel and energy resources development priorities have been identified. In the field of solar energy use in the development of heat supply systems, that is, one of the most useful areas in the field of solar energy use are solar hot water supply systems. However, solar hot water supply systems are not widely used in the country. The reason for not increasing the use of solar energy for hot water supply is the higher capital expenditures for the construction of solar hot water supply systems than the traditional sources used in practice.

This is due to the use of traditional approaches to simplify the system of solar-fired boilers, increase reliability and efficiency, create new technical solutions in the event of non-stationary (time-varying) fall of solar radiation. Traditional approaches give good results in the practical use of traditional energy sources. Because when used in stationary (time-constant) conditions,

new technical solutions can be created that are simple, reliable and highly efficient, and they can be easily connected to heating networks. Therefore, one of the key issues is the creation of solar-powered boilers, which are economical in terms of technical and economic characteristics used in practice. This requires the improvement of existing equipment and the introduction of modern variants of various design schemes. The use of solar energy in our country ensures the economy of fuel resources in the national economy.

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