

ABSTRACT

The structure and scope of work.

Work consists of entry, four divisions, conclusions, list of the used sources from 23 names. The general volume of dissertation makes 90 pages, including 27 pictures and 14 tables.

The urgency of work. One of methods of transformation of sunny energy in electric is a machine method that consists in the use of cycles of thermal machines. Transformation of energy on similar sunny options takes place through the concentrator of sunny radiation, a thermal transceiver-transformer (in particular, Stirling engine) is set in optical focus of that. Perspective of this scientifically-technological direction is universally recognized. In particular, combination of engines of Stirling with the concentrators of sunny radiation is confessed by one of three perspective sunny grids in the plans of Department of Energy (DOE) of the USA made on a period to 2020p. [5].

The objective is creation of CEY on the base of the Stirling UDS-1 engine for research of cogeneration process of receipt of mechanical energy and heated water with a certain temperature level..

Tasks of researches :

1. Creation of research sunny power plant on the base of neat structural elements: sunny concentrator, Stirling UDS engine - 1, power generator and pump.
2. Realization of experimental researches from leading to of capacity of created CEY and determination of basic operating parameters of her structural elements.
3. Analysis of the got experimental results and realization of theoretical calculations from determination of basic descriptions of process of transformation of energy of sunny radiation in mechanical energy, and farther in electric power with the simultaneous use of warmth that is taken in the loop of Stirling

Object of study – experimental sunny power plant on the base of the Stirling engine.

Subject of research: basic descriptions and efficiency of process of transformation of sunny energy in mechanical on the base of research SEU.

Research Methods.

1. Experimental methods: determination of basic operating parameters of elements of CEY (solar radiation, temperature of heat collector SE, frequency of turns of SE, pressure, temperature of cool water, current, tension).

2. Theoretical methods:

- it is an analysis of optic - geometrics descriptions of the mirror-concentrating system;

- it is a thermodynamics analysis of dynamic transformer as SE (method of Smidt)

3. In-experimental methods:

- it is a calculation of efficiency sunny power transformation on the whole depending on the closeness of solar radiation

The novelty of the work is in:

1) use of pilot plant a "sunny imitator is the Stirling engine" with recuperation of the taken warmth and determination of efficiency of her work

2) application of the aquatic cooling for the educational operating layout of the Stirling УДС- 1 engine and creation on his base of CEY a "offset concentrator is the Stirling engine is generator " with research of her technical descriptions in the process of transformation of sunny energy, and also in combination of all picked of structural elements in an only power plant

3) receipt of correlation electric and thermal powers

Applied significance of the work is in

- publication of basic results as scientific reasons;;

- approbation results of research on research and practice conferences;

- usage of the got results in an educational process.

Approbation of job performances. Materials of work were given a report on next scientific and technical conferences:

1) scientific and technical conference of power engineering SPECIALIST. ECOLOGY. MAN (conference of young researchers - graduate students and master's degrees) of Junes, 1-3, 2016. Institute of energy-savings and energymanagement of NTUU "KPI" Kyiv- 2016;

Publications.

1) Research stand a "sunny imitator is the Stirling engine is generator" with recuperation of the taken warmth // Materials of scientific and technical conference of power engineering SPECIALIST. ECOLOGY. MAN (conference of young researchers - graduate students and master's degrees) of Junes, 1-3, 2016. Institute of energy-savings and energymanagement of NTUU "KPI" Kyiv- 2016;

2) Efficiency of the research setting a "offset concentrator is the Stirling engine is generator" with recuperation of the taken warmth // Materials of scientific and technical conference of power engineering SPECIALIST. ECOLOGY. MAN (conference of young researchers - graduate students and master's degrees) of Junes, 1-3, 2016. Institute of energy-savings and energymanagement NTUU "KPI" Kyiv- 2016;

Keywords: offset sunny concentrator, Stirling engine, sunny energy, cycle of Stirling, thermal machines.