Power Engineering

Developed a method of constructing rational functions of the thermal state of the steam-turbine power units of thermal power stations. This method offers a form of bringing these functions in each reference interim and rating of thermal stresses in the most loaded parts to the limit. Revealed the possibility of a significant increase maneuverability of high-power turbine thermal power plant of the type K-300-240.

Heat Transfer in Engineering Constructions

The heat and hydraulic calculation problem of serial plate heat exchangers installation is considered. The analytical correlation of optimal temperature between stages and permissible pressure drop for plate heat exchanger design is obtained. That correlation is met of the minimum of discounted value. The design of four serially installation heaters is demonstrated high efficiency of this solution.

Dynamics and Strength of Machines

The transitional process in oscillating system from Furie-singularisnal force is defined. Furie-singularisnal effect displays a sequence of periodic nonsinusoidal pulse loads, causing the transition process in the system.

Non-stationary vibrations of an rectangular metal-piezoceramics plate under mechanical load are investigated. By using the method of superposition and Laplace integral transform in time the problem is reduced to infinite system of Volterra integral equations. The problem of mechanical load as a function of time identification by values of potential difference between continuous electrodes of a piezoelement is also considered.

A method and algorithm of identification of physical and thermophysical parameters of the thinwalled systems under external influence is considered. It is suggested to determine unknown descriptions of material from the decision of inverse problem of thermoelasticity with the use of different ways of approximation of parameters. The decoupling of parameter's vector led to the decision of parallel problems substantially to the less dimension. Offered approach allows to determine the indicated parameters in the conditions of their substantial dissimilarity.

Applied Mathematics

The scheme of a spherical solar collector is presented. Its principle of operation is described. The analytical forms for the helical curve and its length are found. They will be used for design and making of spherical solar collectors and for calculation of solar energy flow which is received by them against the space coordinates and time.

The paper deals with an optimization problem of packing identical circles into a multiply connected region whose frontier consists of arcs of circles and line segments. On the ground of the characteristics of a mathematical model a solution method is offered. The method consists of a combination of a method of generating starting points, a modification of the feasible directions method to search for local maxima and a modification of the decremental neighbourhood search method to find an approximation to a global maximum. Numerical examples are given.

The system of hydrodynamic equations is written that describe heat and mass transfer in a superfluid. The system is solved analytically by Fourier transformation and expansion of the initial vector (corresponding to the initial perturbation of temperature or concentration) in the eigenvectors of the matrix system. In this study, eigenvectors are calculated in the second approximation in the hydrodynamic parameter, so that the system met the required accuracy.

Non-traditional Power Engineering

Conditions of stabilization of burning of a coal dust are offered by plasma of the microwave - category. The estimation of times of stay and heating of particles of coal in plasma of the category is resulted. Rational values of charges of coal and power inputs on it ignition are determined depending on the microwave of capacity submitted in a torch.

High Technology in Mechanical Engineering

The assaying of perspectives of thermal methods of a finish machining application is carried out. Necessity of thermal-pulse methods development is justified, the basic directions and research problems for creation on their base the flexible automized techniques of a finish machining are formulated. It is displayed that the most perspective are thermal-pulse methods of a finish machining with use of detonating mixed gases.

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