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CONTACT PROBLEM AND STRESS DISTRIBUTION IN BLADE LOCKING PIECES OF THE JET ENGINE'S TURBINE.

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Summary.

In the paper we consider the problem of possibility of adoption of experimental results as an implement of verification of mathematical model for numerical calculations, on the example of blade locking pieces of the jet engine's turbine.

Fig.1 presents geometry of construction.

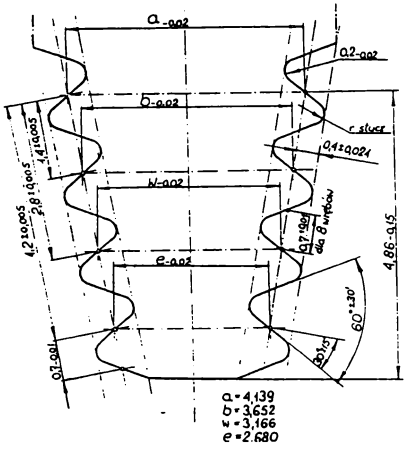


Fig.1.

In the paper we consider the problem of possibility of adoption of experimental results as an implement of verification of mathematical model for numerical calculations, on the example of blade locking pieces of the jet engine's turbine.

Experimental model investigation was put into effect by photoelastic method. In order to assure an adequate geometry of model, blade clearances were transformed.

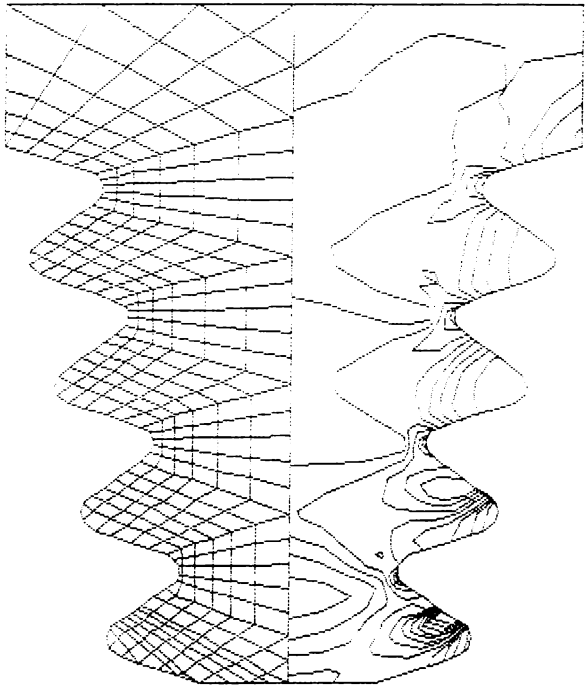
To initiate various states of engine's work the investigation was made for several different values of loading forces.

Fig. 2 presents distribution of isochromaties for one of the cases of loading state.

Fig.2.

Mathematical model of FEM in which contacts between elements of the construction were included was elaborated. In order to project the forces of contact one-dimensional elements of four degrees of freedom were introduced. The stiffness of these elements was determinated by iteration.
The digitazing of area was performed in the basis of photoelastic results.

Printout of the grid and contour lines of isochromaties received on the way of numerical calculation are presented on Fig. 3.



Satisfying concordance of the pictures of isochromaties and contour lines received by numerical calculation suggets the correctness of assumption of mathematical model.

More general case of analysis of the construction requires to pay respect to three-dimensional elements and more adequate way of loading.

Presented results constitute the first step of the consideration the problem of stress distribution in real structures (blade locking pieces of turbines) on the basis of an adequate model investigation.

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