the form of a circular sector based on the results of the experiment. The article presents the results of an analytical study of the boundary value problem of the viscoplastic flow of a thin layer of metal located between thin rough plates moving towards each other. Exact solutions based on the classical formulation in the framework of an "ideal fluid" and "viscoplastic fluid" are given. A real experiment is described for assessing the effect of shear stresses averaged over the layer thickness on the kinematics of the flow of a plastic layer. Comparison of the obtained experimental and analytical simulation results allows us to evaluate the correctness of the chosen mathematical model, which can be used to describe the flows. When designing and introducing into production most high-performance technological processes for processing materials by pressure, not only the numerical values of technological parameters are required, but also the prediction of the behavior of the material during loading. At present, problem-oriented software systems are available based on numerical methods for solving, for example, the finite element method (FEM), various problems of continuum mechanics (MCS). However, without the development of fundamental approaches to the formulation, schematization and analytical solution of boundary value problems, it would hardly be possible to create reliable mathematical models for modern computer systems. Therefore, the further development of theoretical approaches to solving boundary value problems of the MSS is relevant.

Keywords: compression of a circular sector, thin layer, boundary value problem, mathematical model, experiment.

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