One problem of the theory of dimensional electrochemical machining of metals

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Abstract

A method is proposed for determining the shape of the anode-article boundary for a given shape of the cathode-tool in plane problems of the theory of dimensional electrochemical machining of metals. Under the assumptions used, the boundary of the anode-article is divided into the working zone, where metal dissolution occurs, and an adjacent zone, where the treatment (dissolution) is terminated. The initial problem is reduced to a problem of a fictitious plane-parallel potential flow of an ideal fluid with a nonlinear condition on the free surface. The point of separation of the fictitious flow from the solid boundary corresponds to the point separating these two zones of the anode boundary. The Brillouin-Will condition of smooth separation is imposed at the separation point to construct a closed system of equations determining the problem solution. © AIK/Nauka 2009.

Keywords

Electrochemical machining of metals, Hydrodynamic analogy, Numerical-analytical solution