MULTICHANNEL PROCESSING MODULE
FOR PRESSURE WORKING OF MATERIALS

Description
The module is designed for shaping of thin-walled stiffened details under creeping and near-superplasticity conditions using a system of coaxially mounted rods. A computer program sets displacements of each rod particularly. The material is stress-strained without exceeding the material elasticity limit at the strain rates of about fractions of a percent per second and less.

The slow strain modes enable automation and control over the complex process of shaping of parts, almost complete exclusion of hand finishing, reduction of the process labor intensity, and retaining a service life of treated parts at the manufacture stage.

Technical appraisal and economic benefits
The multi-purpose equipment with changeable configuration of the auxiliary equipment has the following advantages: the sandwich clamping of blanks by coaxially-mounted rods enables shaping of double-curved parts of construction stiffness in one pass; the modular structure of the setup allows to shape pieces of any length; the fast direct heating of a blank by halogen lamp heaters makes it possible to combine shaping with heat treatment; the slow strain regime based on multichannel automatic control systems for displacing rods ensures the control of the shaping process within the material elasticity, which should enhance the grade of treated parts and the lifetime as against the available technological processes.

No domestic analogs exist.

Application areas
The module is best employed for small-lot manufacture for producing bearing members forming a complex aero- and hydrodynamic part profile.
The laboratory version of multi-punch module.

A ribbed panel formed in a creep mode.

**Development stage**
Breadboard units of the laboratory sample are available.

**Patent situation**
Protected by RF patents and Inventor’s Certificates. New applications are submitted.

**Commercial offers**
Search for a partner or client for designing and manufacturing of pre-production model.

**Estimated cost**
Design and manufacture of a pre-production model will roughly cost three million rubles (100,000 USD).

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