ES-4M, ELECTRIC-SPARK ALLOYING SETUP FOR DEPOSITION OF PROTECTIVE, HARDENING, AND MODIFYING COATINGS ONTO ARTICLES AND TOOLS

Description
The ES-4M setup is designed for deposition of hardening, wear-resistant, protective, and release coatings onto surfaces of elements of machines and mechanisms, cutting tools, and stamping equipment by electric-spark alloying.

Technical specifications
The setup operates on the single-phase circuit with an alternating current of 220 V at a frequency of 50 Hz. The power consumption is less than 400 W, and the weight is less than 12 kg.

Technical appraisal and economic benefits
Application of a portable setup for electric-spark alloying allows one to save material resources due to an increase in wear resistance of articles and the possibility of reconditioning surfaces, reducing the repair and maintenance time of articles with modified surfaces, and increasing the overhaul lifetime of equipment. A significant advantage over other methods of reconditioning and modification is that portability allows the setup to be used directly at the worksite and the personnel do not need to have high skills and take long-term training courses.

Application area
Depending on the operating conditions, electrode material and workpiece, the setup provides modification of a surface of up to 150 μm thick, including deposition of multilayer release coatings on mounting faces of bearings. For example, the setup allows reconditioning of
mounting faces on shafts of pockets in internal combustion engines or electric engines, deposition of wear-resistant coatings on brake drums in cranes and motor transport. The setup can also be used in the agriculture to harden blades of mowing-machines, fodder shredders, pruners, subsurface cultivators, etc.

**Development stage**
Pilot setups are produced at the Institute of Strength Physics and Materials Science of the Siberian Branch of the Russian Academy of Sciences for testing and improving the technology.

**Patent situation**
Not available.

**Commercial offers**
All forms of cooperation are considered, including setup delivery.

**Estimated cost**
The cost of one setup is 50,000 rubles.

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