

The invention relates to the field of process use of the energy of ultrasonic vibrations and can be used in engineering, shipbuilding and other fields of industry, in particular for deformation hardening and relaxation treatment of metal surfaces of critical structures operating under vibration load. An ultrasonic tool for impact treatment of surfaces of parts contains a housing with a handle covered with a vibration-proof coating, and in the housing a sleeve is located by means of sliding guides with possibility of movement limited by a pin along the housing, at one end of which a head with movable impact elements is placed, which is fixed relative to the sleeve with possibility of quick release, at the other end a nozzle is located for air supply of a system of forced cooling and an electrical cable of ultrasonic vibration generator, and an ultrasonic vibration drive of reciprocating movements with a developed heat exchanger surface is placed inside the sleeve with a ring slot gap and acoustically decoupled which is formed by a piezoelectric transducer with frequency reducing pads, one of which is made as a whole with a transformer of vibrational speed, in which by means of holes the possibility of through pass of air of forced cooling system is provided from the end with a nozzle, through a slit gap with a heat exchange surface and to the working end that communicates with movable impact elements of head and made of carbide, while the sleeve is mounted in the housing with possibility of elastic compression of the impact element against the work surface, and the temperature of heat transfer surface and position of the sleeve relative to the housing are controlled by sensors, heat exchange surface of a vibration drive along the slot gap is made in the form of a helical groove with a semicircular profile, the frequency reducing pad which is not connected to the transformer of vibrational speed is made of a material having an acoustic impedance that is greater than the material of transformer of vibrational speed, the working end of transformer of vibrational speed is made in the form of a pad of hard alloy material with high impact resistant, which is tightly connected to the transformer of vibrational speed, while the thickness of pad is much less than a quarter of the wavelength of deformation, which is set on the length of ultrasonic vibrations drive, the vibration-proof coating of housing is made in the form of a set of rubber rings located in the area of holding the housing by operator's hand and the movable impact elements of head are made in the form of balls of high-strength material that fill a hollow head of conical shape. Application of the invention in the tools for impact surface treatment will improve the efficiency, maintainability and usability of a tool to improve the quality of treatment and reduce operator fatigue.