

The invention relates to the machine-building industry and can be used for removing carbon deposits, rounding sharp edges, decorative grinding, polishing, and surface hardening of machine parts with complex three-dimensional shapes. Controlled device for vibro-abrasive processing of parts comprises a flexibly mounted container that undergoes oscillatory motion driven by an unbalanced vibration exciter, and an activator located in the central portion along its entire length, which is driven into oscillatory motion by a separate unbalanced vibration exciter, the container and the activator, located in its central portion along its entire length, are connected by elastic walls. The unbalanced vibration exciter, which generates the oscillatory motion of the elastically mounted container, is located on the side of the container and is controllable; it allows for remote adjustment of the eccentricity of the centers of mass of the moving and stationary unbalanced masses. A separate unbalanced vibratory exciter, which sets an activator located in the central part along the entire length of the container into oscillatory motion, is controllable, and it is capable of remotely adjusting the eccentricity of the centers of mass of the moving and stationary unbalanced masses located on the shaft, which is mounted on one side on two tapered roller bearings in the cylindrical housing of the activator, positioned in the central part along the entire length of the container. This design of the controlled device for vibro-abrasive processing of parts allows for the separate (independently) control the amplitude and frequency of the cyclic driving force of the controlled unbalanced vibration exciter of the elastically mounted container and the amplitude and frequency of the cyclic driving force of the controlled unbalanced vibration exciter that provides the oscillatory motion of the activator, located in the central part along the entire length of the container. The proposed design solution for a controlled device for vibro-abrasive processing of parts will also allow for independent control of the directions of rotation of the shafts in the controlled unbalanced vibration exciters of the elastically mounted container and the activator located in its central part along its entire length. Controlling the frequency and amplitude of the vibrations of the controlled unbalanced vibration exciters will ensure that the vibration field parameters in the elastically mounted container are maintained at a predetermined level—which is optimal from a technological standpoint—throughout the entire cycle of vibro-abrasive processing of parts. Controlling the directions of rotation of the shafts in the controlled unbalanced vibration exciters, the elastically mounted container, and the activator located in its central part along its entire length will allow for controlling the trajectory of movement of the parts and the (processed) working medium in the elastically mounted container throughout the entire cycle of vibro-abrasive processing of parts