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ANALYSIS OF WORKING PROCESSES AND EQUIPMENT DESIGNS FOR ROTARY – ABRASIVE CLEANING OF PARTS

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Cleaning parts from contamination is a specific operation, the quality and completeness of which primarily determines the durability of repaired machines. The most laborious part of cleaning parts from resin, scale, hardened carbon deposits, old lubricants, etc. is performed with significant intensification, while the effective use of abrasive cleaning methods.

The essence of abrasive cleaning is that the surfaces of parts dynamically interact with an abrasive, which has a large reserve of kinetic energy. This energy is spent on cutting off contaminants in the form of small chips and on their grinding. Kinetic energy can be provided to the abrasive in various ways. One of them is rotary-abrasive. In this cleaning method, the working mixture is placed in a container that rotates with a constant or variable angular velocity. Depending on the kinematic schemes, rotary-abrasive equipment is classified into gravitational, centrifugal-gravity and centrifugal-inertial.

The main working elements of *gravity equipment* are rotating drums, inside which the cascading movement of the working mixture with free fall is carried out. The frequency of rotation of the drum is determined based on the analysis of the phases of movement of the elements of the working mixture [1]. To intensify the process, installations with a pendulum-type drum are used. During operation, the drum performs an uneven movement, and its axis of rotation moves along curved guides. Significant changes in speeds and accelerations create good conditions for intensive processing of parts. At the same time, a constant hydrodynamic effect on the cleaning objects is ensured. To increase the productivity of the installations, a screw transporting rotor can be placed in the drum.

More productive is the *centrifugal-gravity equipment*, the working bodies of which are combined containers, in which the hemispherical bottom is given a simple rotational motion. In this case, the working mixture under the action of centrifugal forces rises up along a helical line. Having reached a stationary shell, it sharply slows down and falls to the bottom under the action of gravitational forces. The productivity of centrifugal-gravity type installations is 20 times higher than that of vibrating machines, but they are difficult to manufacture and operate. There are also installations with planetary rotation of containers around horizontal or vertical axes [2].

The working elements of *centrifugal-inertial equipment* are sealed cylindrical containers with portioned loading of the working mixture. They are given complex planetary motion around horizontal or vertical axes. The centrifugal contact forces and the large difference in relative speeds of movement of parts and abrasive that arise in this case significantly exceed the productivity of the equipment compared to gravitational. However, the scope of application of this equipment is clearly limited by the dimensions of the parts and their mass.

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