

645. Active control of the process and results of treatment

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Abstract. The article analyzes the problems associated with the measurement and control of process parameters and the parameters of the work piece. Stabilization force parameters, of acceptable quality requires a regulator with variable structure and high precision of their measurement. Analysis of the frequency change in the power of idling can detect defects in the kinematics. Rate of change of load can determine the dynamic parameters of the cutting process. When handling gears stabilize the load can be performed by a pulsed method

Keywords: cycle of grinding, regulator with variable structure, power measurement, dynamic parameters, kinematic delay.

Introduction

In the industry are used in cycles of grinding with the active control of the cutting conditions and the accuracy of the work piece [1]. At the beginning of treatment feeder brings the grinding wheel to the work piece and cuts into it. This results in an increase in power consumption of electric drive range to a predetermined level. Next, a special stabilization system controls the feed mechanism so that the power level was constant. After removing the main part of the allowance, in the cutting zone is entered the device measuring the diameter of work piece. Additionally, this device measures the amplitude of the fluctuations in the size of the rotation frequency (deviation form) of the work piece. At a certain ratio of errors of form and an allowance begins the final stage of processing when the control system adjusts the flow to withstand pre-calculated optimal ratio of errors of form and an allowance. At the final stage, the decrease in power and the change in the error form.

The described method has reduced the processing time and save, and in some cases significantly improve the quality of treatment. In the practical application of the method needed to improve systems of automatic control of process parameters during the cutting process and improve the static and dynamic power measurement accuracy in the processing and idling.

System of variable structure for the regulation of technological parameters in cutting

When the processing tool is not in contact with the work piece, occurs opening a feedback loop control system (fig. 1). With the closure of the loop, proportional-integral controller gives a large overshoot.

Typical graphs of the controlled quantity (power or torque cutting) and the control action (flow) during the penetration tool into the work piece when the regulator with variable structure are shown in the fig. 2.