

Device for sorting lump ore containing minerals with weak magnetic susceptibility and non-magnetic minerals comprises a device for dosed feeding of ore lumps onto a conveyor, a device for electromagnetic influence on the lumps, a system for identifying ore lumps based on the presence of a valuable component, and a system for sorting the lumps into streams, one of which contains the valuable component and the other consists of waste rock. In addition, device includes a 3D scanner positioned above the conveyor belt, which is capable of performing preliminary identification of the ore lumps based on their geometric parameters and spatial orientation. Furthermore, device includes a sorting controller, a sensor unit, a human-machine interface, an encoder, and a pneumatic valve unit. The sensor unit comprises a signal processing unit, a data exchange interface, and a sensor array in which the sensors are arranged according to a special coordinate grid designed to measure the magnetic susceptibility of lumps with paramagnetic properties. Each sensor consists of an induction coil connected to a measuring oscillator, which is linked to a Schmitt trigger and a signal processing unit, which is connected to the oscillator via an activation key. The sorting controller contains a computing unit, a valve control unit, and a synchronization unit. The computing unit contains a module for storing initial data and constants, a module for measuring the geometric parameters of the lumps and generating coil activation delays, a module for compensating for the geometric dimensions of the lumps and their placement on the conveyor belt, a module for eliminating mutual interference between individual lumps and measuring electromagnetic background noise, a data and control signal processing unit for the sensor unit, as well as communication interfaces. The synchronization unit contains a digital synchronization signal input, a command and synchronization signal processing unit, and a data exchange interface. The valve control unit contains a command processing unit and a data exchange interface, while the human-machine interface contains an input-output interface and a data exchange interface.