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INTELLIGENT WASTE SORTING SYSTEM

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Scopul:

Development of a compact system for automatic sorting of household and industrial waste according to their physical parameters.

Soluție:

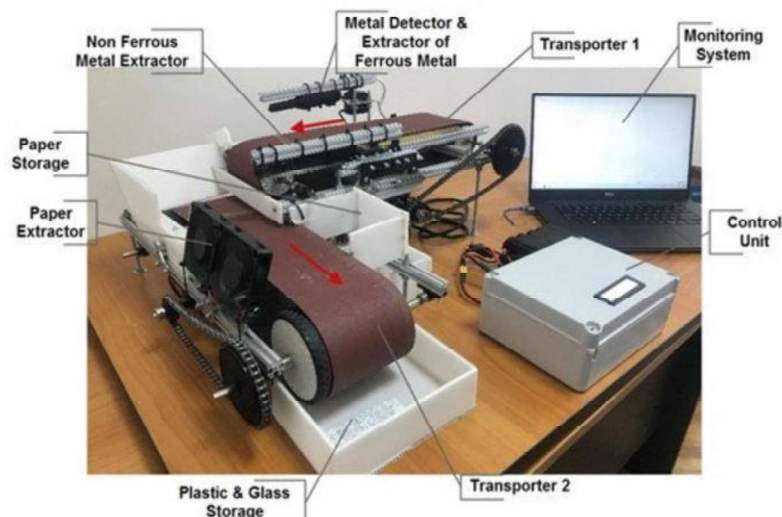
Development of a compact and autonomous system for sorting managerial and industrial waste based on physical properties of the waste. The scientific concept of the applied method is based on Artificial Intelligence models with self-learning properties. The technological concept is based on the automatic movement of waste on a conveyor, the analysis of its physical properties, and sorting the waste in ferrous and non-ferrous metals, plastic, glass and paper.

Avantaje:

- Automatic operations for sorting waste in metals and non-metals;
- Non-metallic waste sorting in reusable paper and non-recyclable waste;
- The use of intelligent algorithms with self-learning properties for identification and sorting of ferrous and non-ferrous metals, paper and plastic;
- Metals sorting into ferrous and non-ferrous ones;
- Minimal cost of prototype development.

Stadiul:

Mathematical models and intelligent algorithms for automatic waste sorting;
 Functional prototype that proves the correctness of mathematical models and algorithmic implementation.



The basic principle of waste sorting is the use of electromagnetic induction for the detection and extraction of ferrous and non-ferrous metals. Light waste (paper or cardboard) is extracted using a fan. The rest of the plastic and glass waste are stored depending on their weight.

The sorting system contains the following modules: 2 conveyors for transporting waste through sorting areas, metal detection sensor, electromagnet for extracting ferrous waste, non-ferrous metal sorting gate, fan for removing light waste (paper, cardboard), and a set of containers for waste storage. The control unit is made on the ATmega 328P microcontroller which implements an algorithm based on artificial intelligence with self-learning properties of the process of identifying ferrous and non-ferrous metals. LN298 drivers were used to control the engines controlled by PWM signals. The sorting process and parameters are monitored by a desktop application.