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Automated Garbage Separation System

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With rapid urbanization and uncontrolled growth rate of population, municipal solid waste management has become an acute problem in Sri Lanka. The disaster at Meethotamulla points out the importance of proper waste management. Waste disposed of in landfills is not only impossible to reclaim because of the hazardous manner of dumping, but also has serious environmental implications in terms of ground water pollution and contributes to global warming. This reduces the average life span of the manual segregators. Development of a waste separator system will facilitate the recycling process. Hence it helps to gain a cleaner and a greener place, which is the purpose of this project.

This study focuses on the development of a mechanism to separate organic and inorganic waste, which is found in bulk. The proposed system consists of a magnetized funnel, air separator duct, rotatable barrel, linear actuator with capacitive proximity sensor, and vacuum pump. Metal parts are collected via a temporary magnet and lighter objects are separated from the air separator. The rest of the garbage is put down to the barrel. This barrel consists of an inner and outer barrel. The inner barrel has holes and an ultrasonic sensor. The ultrasonic sensor gives a signal to the linear actuator. When the barrel starts to rotate leftover lunch packets unfold and food waste goes through the holes in the inner barrel. The food waste is collected from the gate on the outer barrel. Remaining in the inner barrel are polythene and paper. The linear actuator with capacitive proximity sensor and vacuum pump is used to separate polythene and paper into organic and inorganic waste. After the barrel unfolds the leftover lunch packets, the linear actuator goes forward, identifies the object, and sucks it with the help of a vacuum pump. After that linear actuator goes backward and drops it into a suitable bin. Once the operation is completed, the permanent magnet switches off and the funnel door opens and collects the metal parts automatically.

The proposed system was capable of separating metal, polythene, plastic and food waste automatically. Therefore, the proposed system reduces the problems related to garbage separation, supports in waste management and reduces the environment pollution.

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