

ABSTRACT

This project named as BOSSAL ROBOT is made of a static self-governed robotic arm which is used to sort three different materials according to their physical properties (metal, plastic and glass) in form of cans. Six cans with a pair of each of the three materials are placed in a main box at north position. The robotic arm will comprise the clipper which clamps and places the metal cans in the east, the plastic cans in the south and the glass cans in the west and moves back to the original north position. A PIC 16F877A microcontroller is used as the control unit for this project.

The robotic arms detecting mechanism use sensors consisting of magnetic and IR sensor. Magnetic sensor will detect the metal cans, then the IR sensor will detect glass cans and when none of these two are detected, the robotic arm recognizes it as a plastic can. The IR sensor is connected to LM358N comparator which makes comparison between two values: inverting input and non-inverting input to produces a high or low output.

A MO-SPG-30-20K DC motor and two C55S servo motors are used to maneuver the Robotic Arm. The DC motor moves the robotic arm's 'shoulder' through 360° from the default north. The two servo motors are used to clamp the cans and to move the robotic arm up and down. Four limit switches are placed in north, east, south and west positions to detect the position of the robotic arm. Steel balls placed below the limit switches are used to activate them.

Keywords: Magnetic sensor, IR sensor, PIC 16F877A, LM358N, MO-SPG-30-20K, C55S, Limit Switch, Steel balls.