Automatic Trash Collector and Dumper by Using Solar Energy

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Abstract - **Now-a-days, management of waste from its collection to dumping and disruption has become one of the greatest challenging and arduous chores for municipal corporations, all around the globe. To make this Tedious job facile, a new concept of Smart Dustbin has been taken into consideration for Smart buildings, Hospitals, schools, and railway stations. The Smart garbage collector thought is an advancement of traditional garbage collector by levitating it to become smart inculcating sensors and some form of logics. This smart Collector is a revolutionary idea of application of line following garbage car and pole fixed garbage part on Predesigned locomotive path. The fixed bin makes use of ultrasonic sensors for level of garbage detection and updates the coeval level of the bin to the garbage car, using RF Module. This is thereby a fully automated System, making small contribution towards the theme of Clean India Green India.**

Index Terms - **Waste Collecting Robot, IR Sensor, Ultrasonic Sensor, Arduino, RF Module.**

INTRODUCTION

In today's era as we know that where countries are developing at a rapid rate a lot of unwanted waste is Being generated like electronics, plastics, and many biodegradable products. Waste management being the most spurned factors countries creates an urgency to address this problem. In metropolitan or City areas, the clearance of waste management has been a grind task for the majority of the country all over the World. There is need of a well- organized waste clearance system is mandatory by keeping green environment. There are many existing expertise mechanisms are available for handling as well as managing waste. But the Lacking for gathering information is a major challenging task. This flounder will perturb the quick nationwide Rate of growth in heaped urban areas as well as its growing demand for the citywide ecological and Environmental protection. This is a major challenging in waste management system to create a prototype Because of the paucity of planning and systematization among government, people and local authority for shipping and processing waste. Currently the waste gathering is conventional which acquire a lot of labors and Is time overwhelming process.
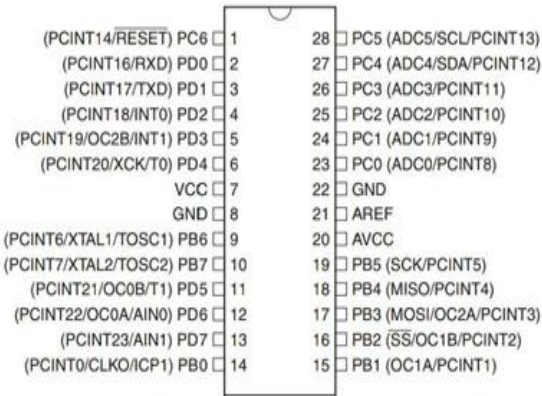
CIRCUITARY

Some of the system requirements of the project are listed below:
1. Motor driver circuit is used for the motion of the robot.
2. Power supply as to get sufficient power for the motor.
3. The robot requires a motion controlling unit i.e., Arduino Uno kit with adapter.
4. Automatic motion of robot is obtained by using sensors in the navigation system.
5. Metallic structure of the robot.
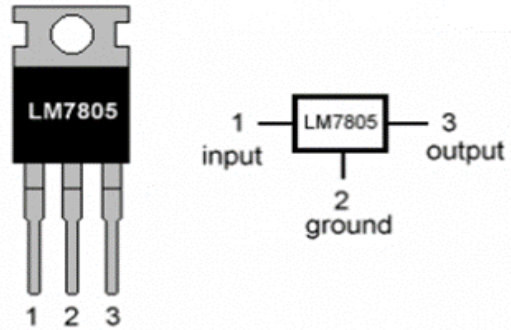
SYSTEM ARCHITECTURE

1. Atmega 328P
The Atmel 8-bit microcontroller merges 32KB flash memory with the capabilities of read-while-write, 2 KB SRAM, the 32 general purpose working registers, three pliable counters/timer, external and internal interrupts, a SPI serial port, 6-channel A/D converter, programmable watchdog timer as well as the five software power Saving modes.

Fig 1. Shows Arduino Nano Atmega 328P

2. Ultrasonic Sensor

Fig shows the ultrasonic sensor. This sensor is being placed in the fixed pole part of garbage bin, so as to Intimate about the garbage level of the fixed garbage part.

Fig 2. Shows ultrasonic ranging sensor

3. Infrared Sensor

sensor here used is to control the path of garbage collector robot. It is also used to encounter the extent of the muck in the garbage car. Fig shows the diagram of infrared sensor.

Fig 3. Shows infrared sensor

4. LM 7805
Features:
1. Output Transistor Safe Operating Area Protection
   Description

2. Output Current up to 1A
3. Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24V
4. Thermal Overload Protection
5. Short Circuit Protection

LM7805 PINOUT DIAGRAM

6. High speed DC motor
- Specification: (Model# 25GA370D12, i = 1:25.5)
- Voltage: 12.0VDC
- Output Speed: 200 +/- 10% RPM
- No-Load output current: =< 50 mA
- Rotation Output: CW / CCW
- Noise: No Gear Noise

7. Motor Driver

A motor driver is a module that helps in the operation of certain motors at variable speeds by providing a separate power source other than that from the microcontroller. This protects the microcontroller/ microprocessor from the current surges initiated by the motor.

RESULTS

The purpose of this work is to design a robot which automatically moves, detects, lifts the dustbin, and collects the wastes in the dustbin. It paves way for smart garbage system in companies. It ensures safety and does not consumes time and also safety for humans preventing from allergic and other diseases. It prevents from being theft. Thus, it is capable of disposing of waste which is present in garbage economically.

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