Automatic Waste (Metal and Non-Metal) Separation using IR Sensor

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Abstract— *In India, the collection, transportation and disposal of waste are unscientific and chaotic. Uncontrolled dumping of waste on outskirts of towns and cities has created overflowing landfills, health hazards for the surrounding public. Many machines work to divide and segregate, recycle the waste in various methods like incineration. But for household waste, bag pickers play an important role in the recycling of urban solid waste. Rag pickers and conservancy staff have higher morbidity due to infections of skin, respiratory, gastro-intestinal tract and multisystem allergic disorders, in addition to a high prevalence of bites of rodents, dogs and other vermin.*

Keywords— Unscientific, Bag Pickers, Recycling, Morbidity, Vermin, Respiratory

I. INTRODUCTION

The main aim of the project is to segregated waste because when the waste is separated into streams such as wet, dry and metallic. The waste has a higher potential of recovery and consequently, re-cycled and reuse. The wet waste fraction is often converted either into compost can replace demand for chemical fertilizers, and biogas can be used as source of energy, the metallic waste could be reused or recycled. In recent times, garbage disposal as become a huge cause for condemn in the world. A voluminous amount of waste that is generated is disposed by means which have an adverse effect on that environment.

II. CIRCUIT DESCRIPTION

A. Power Supply:

The power supply is a primary requirement for the project work .the required dc power supply for the base unit as well as for the recharging unit is derived from the main line. For this purpose center trapped secondary of 12v 0v 12v transformer is used. From this transformer we getting 5v power supply.

B. Voltage Regulator:

LM78XXXY series of the three terminal regulations is available which several fixed output voltages, making then useful in a wide range of applications. This voltage available allows these regulators to be used in logic systems, instrumentation and other solid state electronic equipment.

C. LED Display:

An image in an LCD is formed by applying an electric field to alter the chemical properties of each LCC (liquid crystal cell) in the display in order to change a pixel's light absorption properties. These LCC'S modify the image produced by the backlight into the screen output requested by the controller. A 16 character X2 line LCD module to the parallel port.

D. L293D:

DC motors are here, there are many things which you can do with your dc motors when interfaced with a micro controller. L293D has output current of 600mA and peak output current of 1.2A per channel can harbor disease vectors which spread harmful diseases.

E. Microcontroller:

The Atmel AT89C52 is a powerful microcomputer which provides a highly flexible and cost effective solution to many embedded control applications

F. RST:

RST means RESET, 89C52 uses an active high reset pin .it must go high for two machine cycles .The simple pc circuit used here will supply voltage (Vcc) to reset pin until capacitance begins to charge.

G. IR Proximity Sensor:

When waste falls into the system it is detected by the IR proximity sensor. The IR led keeps transmitting IR proximity infrared rays lap to some range.

H. Metal Detector:

Now the waste falls on the metal detector have inductive coil which is the parallel inductance and capacitance (LC) circuit the measure.

III. CIRCUIT OPERATION

A. AT89C52:

The Atmel AT89C52 contain 4K bytes of flash, 256 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, a five vector two-level interrupt architecture, a full duplex serial port, and on-chip oscillator and clock circuitry .The architecture of 8052 is similar to 8051 with 4 I/O port,3 timer/counters etc.; The main operation done in this controller with 40 pins.

B. The On-Chip Oscillator:

Pins in AT89C52 XTAL1 and XTAL2 are provided for connecting a resonant network to form an oscillator. The crystal frequency is basic internal clock frequency. The maximum and minimum frequencies are specified from 1 to 24Mhz.Program instructions may require one, two (or) four machine cycles to be executed depending on type of instruction to calculate the time any particular instruction will take to be executed, the number of cycles 'c'

T=C*12d/crystal frequency

C. IR Sensor:

In IR sensor contain the following classifications Max 232c: It is a converter connected to serial or comport of the pc. It convert RS232 standard to TTL standard and vice versa the max 232c in operated with +5VDC from the connection.

D. IR Modulator:

The IR modulator is an as table multivibrator developed NS555IC for 33KHZ frequencies to use machine.

E. IR LED:

The IRLED receives 35KHZ frequency or 0HZ frequency from modulator via driver transistor, BC547 the output of IR LED is an IR light produced while receiving Bit 0 from pc

F. Metal Detector:

The detector measures the parallel resonance impedance of a parallel LC circuit and return data as a proximity value to the microcontroller using LDC1000. This gives different logical outputs in the presence of metal and in the absence of metal. This is fed as input to the microcontroller, and we can see whether the waste is metal or not with the help of LCD interfaced with microcontroller.

G. DC Geared Motor:

DC geared motor receives inputs from microcontroller to monitor the clockwise and anti-clockwise motion of the motor.

IV. RESULT

Developed the program for functioning of microcontroller 8051 and build in vision with no errors.

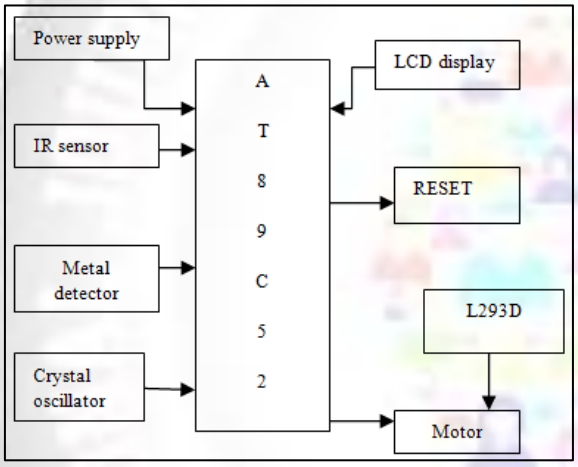

Fig. 1: Block diagram of AWS

Dumped code after the preparation of hardware required for the proposed system using flash magic software. The detector of waste as metal or non-metal is done by dumping them into hardware design kit and verified for many objects call into the system.

Fig. 2: Block diagram of AWS

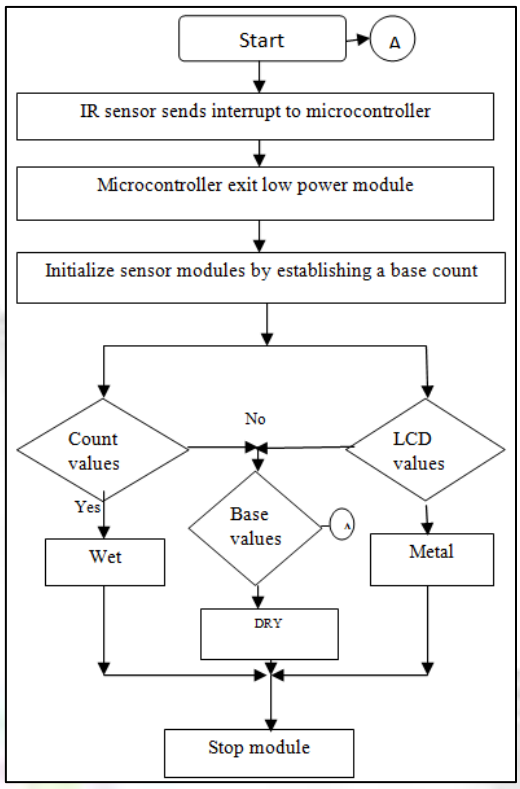

Fig. 3: Flow Chart

V. CONCLUSION

The proposed system "automatic waste separator "sorts wastes into three different categories, namely metal, dry and the wet waste. Waste segregation means division of waste into bio-degradable and degradable waste. It is a low cost, most appropriate technological option for safe management. Through this system we can realize a compact, low cost and user friendly separation system for urban house hold, college and offices to streamline the waste management process.

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