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The Smart Eco Bin: A Study of Commercial Utilisation of Domestic Waste and Utility Services for Making Future Smart Cities

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ABSTRACT

SMART ECO-BIN is a kind of electronic machine where by dropping waste material you will get some point as per the weight of your object (Glass, Paper, Plastic, and bottle). Municipality takes many majors to maintain cleanliness of the city. The main function of municipality is to clean the waste material from the rural area and in a city. We have designed a Smart Eco-Bin for solving these problem. This machine will be install in where the more people are visited (Shopping mall, Railway stations, Airport, City Center, Bank, and Food stalls etc.). It is a best decision to support the swatch bharat mission to convert the environment into clean and green. Instead of dropping waste material here and there we will throw the waste material in our machine which can clean the environment as well as make healthy society. we need an application for operating this smart eco bin machine. You need to create your smart eco bin account.

Keywords : Ardiuno, Display, Wi-Fi Module, Motor Driver, Stepper Motor, Weight Sensor

I. INTRODUCTION

SMART ECO-BIN is like a machine where by dropping the waste material like Paper, Plastic, Glass, bottle etc. These Smart Eco-Bin machine will be install in public place like bank, shopping mall, bus stops, railway stations, airport, food stalls etc.

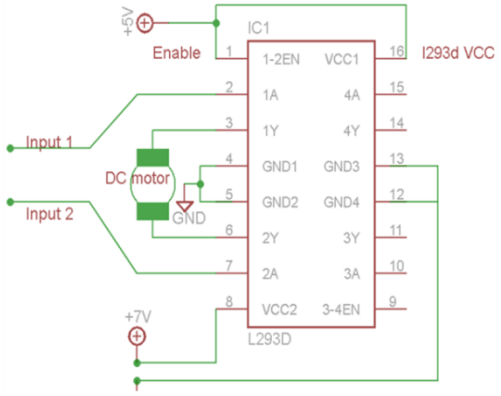
The main purpose of this smart eco bin is to instead of throwing the waste material like cold drink cans, plastic material and papers here and there we can drop it in the eco bin machine as the outcomes of that we will get a clean, green and healthy environment.

As we know dustbin need everywhere to make environment clean and green and due irregular removal of garbage present in dustbin get accumulated so, here we have figured out a new model for the municipal dustbin for immediate cleaning of that eco-bin machine. This dustbin is also designed to compress the garbage periodically thus preventing the unnecessary occupying of dustbin's space by light weighted but space occupying garbage particles like sponges

II. METHODS AND MATERIAL

1. Motor Driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. To control a set of three dc motor simultaneously in any direction motor driver is used. Figure-1 Let consider a Motor connected on left side output pins (pin 3, 6). The input has to be provided for rotating the motor clockwise and anticlockwise direction for closing and opening of doors of the machine with logic 0 and logic 1.



There are two Enable pins on motor driver. For being able to drive the motor Pin input 3 and pin output 6 are used, the pin 3 and 6 need to be high.

2. Arduino

Arduino are used here to control all inputs- which is given through mobile application's buttons and turn it into an output –rotating motor for closing and opening of window. The instruction is send to the microcontroller on the circuit to use the Arduino Software, according to the software it will work

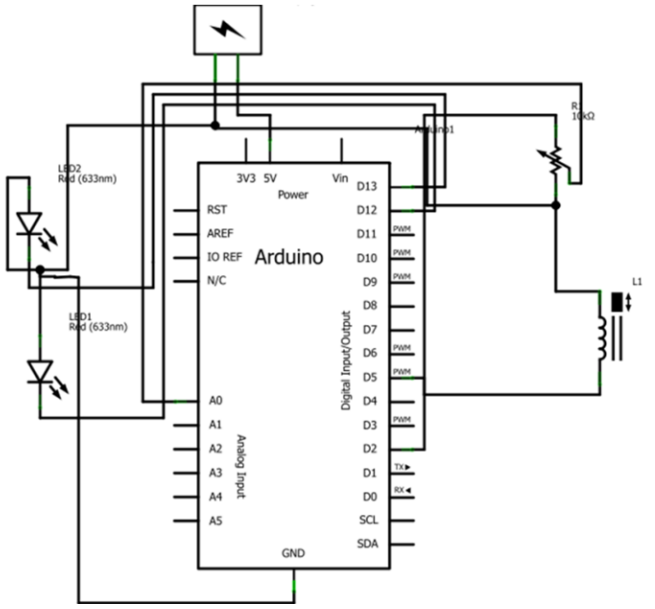


Figure-2

3. Stepper Motor

A Stepper motor is a type of DC electric motor this motor can control though a fixed angular step in response to each current pulse received by its controller. Here stepper motor are used to closing and opening the door of particular chamber of machine for dropping the waste material. Whatever we get the output from the Arduino according to that instruction its rotate anticlockwise and clockwise for opening and closing the window of the eco bin machine respectively.

4. Load Sensor

Description: Here we use load sensor to sense the weight of the waste material as the input of that sensor and we get a digital number as the output of the weight sensor and that output will seen on the display on our machine (Eco-Bin). This sensor can measure up to about 118 pound.

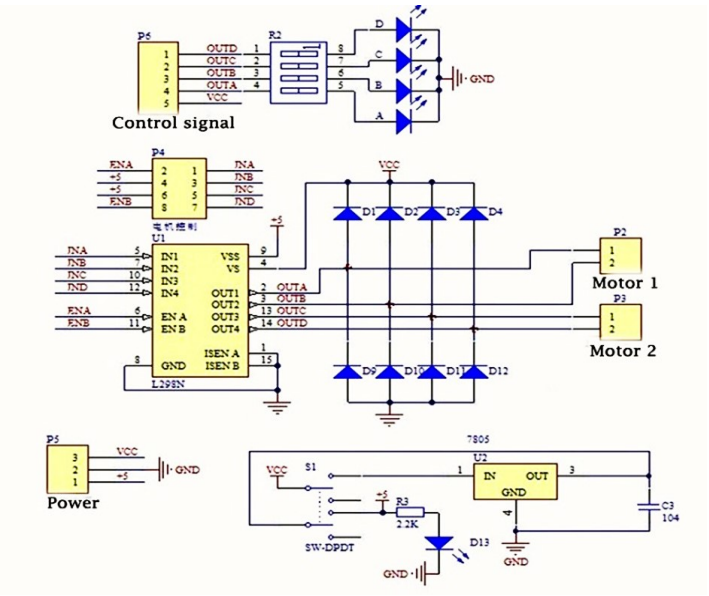
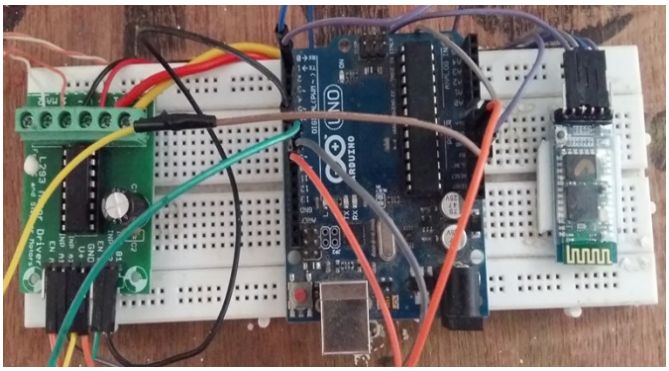


Figure-3

5. Methodology

It will give you an appropriate point according to the weight of the waste material, you shall be credited some amount in your bank account according to the point which you received earlier. For using this smart Eco-Bin machine we required an application which is specially meant for it. You need to create your Smart Eco Bin account. You have to connect your mobile app to the machine via Wi-Fi, at the same time machine will automatically recognize your identity and stay connected. Select the category of your waste material from the menu i.e. a. Plastic b. Paper c. Glass. There is a special chamber for each option, if the option will not match it will not receive any waste material from your side.



III. RESULTS AND DISCUSSION

The project model is supplied with 12V supply through the dc socket. Voltage regulator will regulate the voltage according to the required supply of the equipment which are used in the circuit. The Arduino 8085 microcontroller is supplied with +5V. And the motor driver is connected with the three pins of power supply.

The Wi-Fi modular are used to connect the microcontroller through this Wi-Fi device we connected to the mobile application and through this application we give the instruction according to that the motor starts rotating and all the measuring elements starts to measure the parameter values.

IV. FUTURE USES

Its unique advantages is that here it will pay back money for disposing waste material in our dustbin. It support a clean, green and healthy environment to live in. Because of The financial benefit of that dustbin it is very obvious that it is sustainable and it also support Swatch Bharat Abhyan.

V. CONCLUSION

Various features such as durability, affordability, prevention against damage and maintains issue are addressed when these smart eco bin are designed .this smart eco bin can contribute a lot towards clean and hygienic environment in building a smart city. But since the technology is new in India, proper awareness should be created among the public it is implemented on a large scale. Otherwise, sensitive devices like sensors might be damaged due to rough action of the user.

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