SMART BIN (AUTOMATIC TRASH CAN).

INTRODUCTION

Smart bin, also known as an automatic trash can or sensor bin, is a type of waste container that opens its lid automatically when someone approaches or when trash is nearby.

It is mainly used in kitchens for food waste, in offices for paper waste and in public spaces, like parks or malls.

It promotes Convenience, hygiene and accessibility.

AIM

The aim of the project was to basically avoid the touching of bins that are at times contaminated with pathogens. Bins are known for depositing waste materials. Waste material that are biodegradable which maybe contagious. This will cope with maintaining cleanness and proper hygiene.

The aim of this project is to design and implement a self-opening bin using logic circuits to promote hygiene, reduce physical contact with surfaces that are potentially harmful to health and finally to improve convenience in waste disposal.

MATERIALS TO BE USED

1. SENSOR (2)
2. MICROPROCESSOR
3. MOTOR
4. WIRING
5. POWER SUPPLY
6. LED LIGHTS(2)
7. BUZZER

HOW IT WORKS

- The sensor emits high-frequency sound waves from a transmitter. These waves bounce off an object and return to the receiver. By measuring the time it takes for the waves to return, you can determine the distance to the object.
- When an object is sensed it triggers the motor to make a 90 degree rotation making the bin to open.
- Another sensor will detect whether the bin is full or not and will alert the buzzer. It will also alert the motor not to open up anymore.

- The buzzer will then make a sound alerting the user that the bin will no longer take anymore trash until it is emptied.
- A green LED light is on to indicate that the bin if not yet full and the red LED light will indicate when the bin if filled up.

This system would make use of a motion sensor to detect a hand or foot movement near the bin. This movement will send an active high (1) signal to the required logic gate instructing it to turn the motor that lifts the lid up. Once the hand or leg is moved away from the motion sensor, the signal sent to the logic gate becomes active low (0), which instructs the motor to close the lid.

SOME IMAGES OF THE PARTS ARE ILLUSTRATED BELOW

Figure 1 shows what happens when an individual approaches the bin. It senses a nearby object and triggers the motor to open.

Figure 1

Figure 2 shows the internal structure of the bin

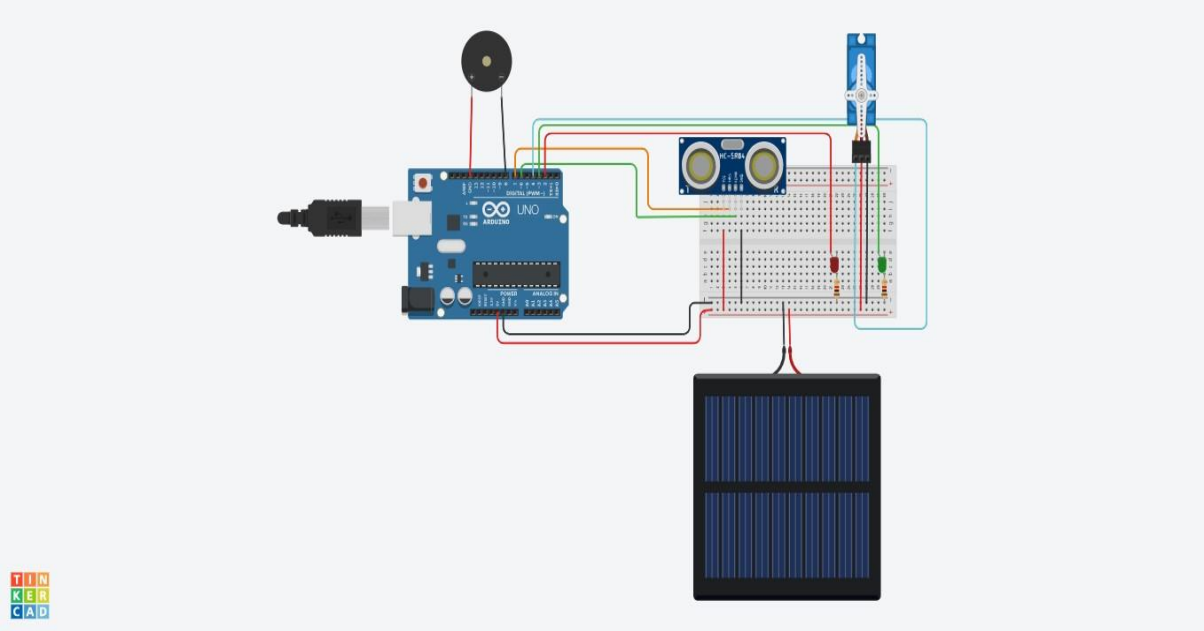

Figure 2

1. ADRUINO
2. SENSOR
3. MOTOR
4. Power source
5. Buzzer 6. LED

MOTOR

This is makes the opening and closing of the bin possible. The bin receives instructions when a near by object is detected to open the bin after some seconds close the bin.

Figure 3

SENSOR

This detects the nearby object and singles the motor to open up. The sensor will detect any object that's at least 20cm near the bin and will trigger it to open. After ten seconds the bin will automatically close.

Figure 4

POWER SUPPLY.

Rather than using a battery this bin will utilise the use of cleaner energy resources such solar. It will be responsible for supplying power to the whole system for it to function.

Figure 5

ARDUINO

This will coordinate everything together. It will link everything together and will ensure that they function according to the instructions given.

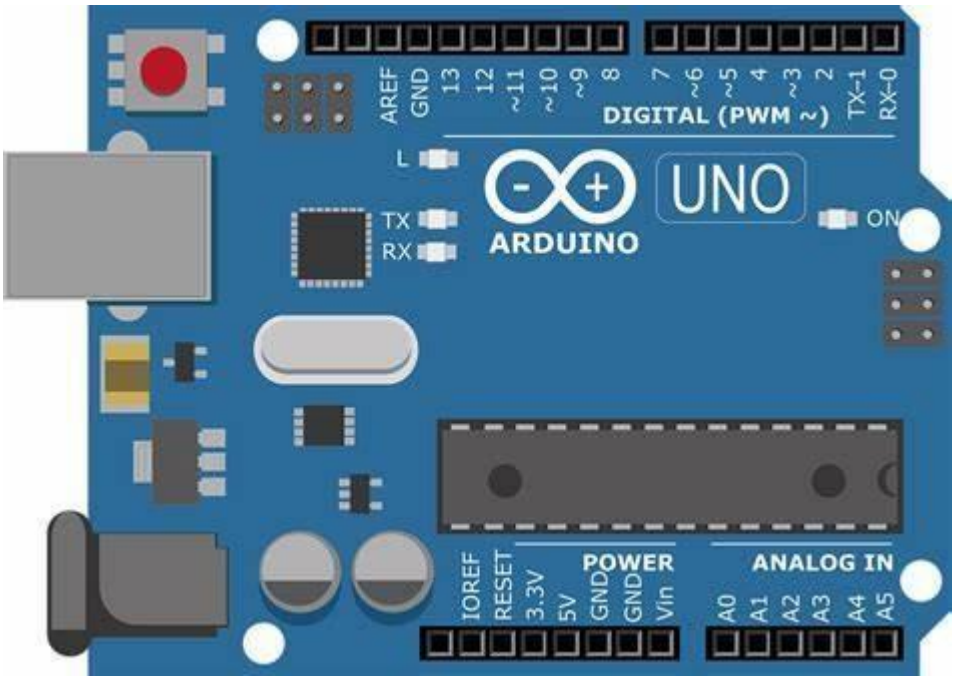

Figure 6

BUZZER.

This will make a sound to indicate that the bin is full.

Figure 7

LED LIGHTS.

Two LED lights will be used to indicate that the bin is free or full. The Red LED light will indicate that the bin is full while the Green LED lights will indicate that it is free.

Figure 8