Electronic Grocery Machine

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Abstract

Since, Many years in grocery shop grocery is measured manually which is very time consuming process and due to which more numbers of people are gathered. Due to various demands of people manpower requirement are increased and also increase the cheating ratio in shop. To overcome this problem we want to develop one kind of grocery machine which gives accurate and fast output. The system having less time consuming and man power requirement is less that means only one person can handle this whole system. We used different types of token for selecting the type of grocery such as Wheat, rice etc. Depending upon weight and material of token this system gives desired output. Whole system controlled by either microcontroller or PLC (Programmable Logic Control). Now a days, corruption in government grocery shop is increased. So, in future to reduce this problem by connecting this system with online website. By giving that facility consumer gets accurate amount of grocery. We can also implement this system by using RFID (Radio Frequency Identification) card, swiping card, Touch screen etc.
Keywords: Electronic Grocery System, Electronics Grocery Shopping System, Electronics Payment In Grocery Shop, Grocery Shopping System By Using Token System, Grocery Shopping Using RFID Card

I. INTRODUCTION

Now a day's recently ATM (Automatic Teller Machine) machine gives only money but it doesn't given any type of grocery like wheat, rice etc. Generally in grocery shop measurement of grocery is becomes manually, it is very time consuming process due to which more numbers of people are gathered. Due to that condition traffic will be increased at a shop and workers are being confused. This kind of situation is effect on the measurement of grocery. Sometimes some personal problem of shopkeeper is effect on the grocery measurement. Due to various demands of people manpower requirement are increased and also increase the cheating ratio in shop. Generally in government ration shop corruption is appearing in distribution of grocery.

Electronic Grocery Machine (EGM) is the solution of this problem. It gives accurate and required amount of grocery. In EGM grocery measurement process is done automatically and require less time for measurement. It also beneficial for shopkeeper because required only one person to handle it.

EGM is works on the principle of token system. We getting desire amount of grocery by using different weight and different material of token. Suppose we wants 1 Kg wheat, that time 10gm aluminum token are used for 1 Kg wheat. We use IR(Infrared) sensor whenever any object is pass out over the IR sensor light will reflect on sensor. So, If We put the token into token mechanism that time IR sensor will detect the token than detect the logic '0' and '1'. These logic is given to controller it specify how much time controller allows to flow control motor ON and OFF.[1]
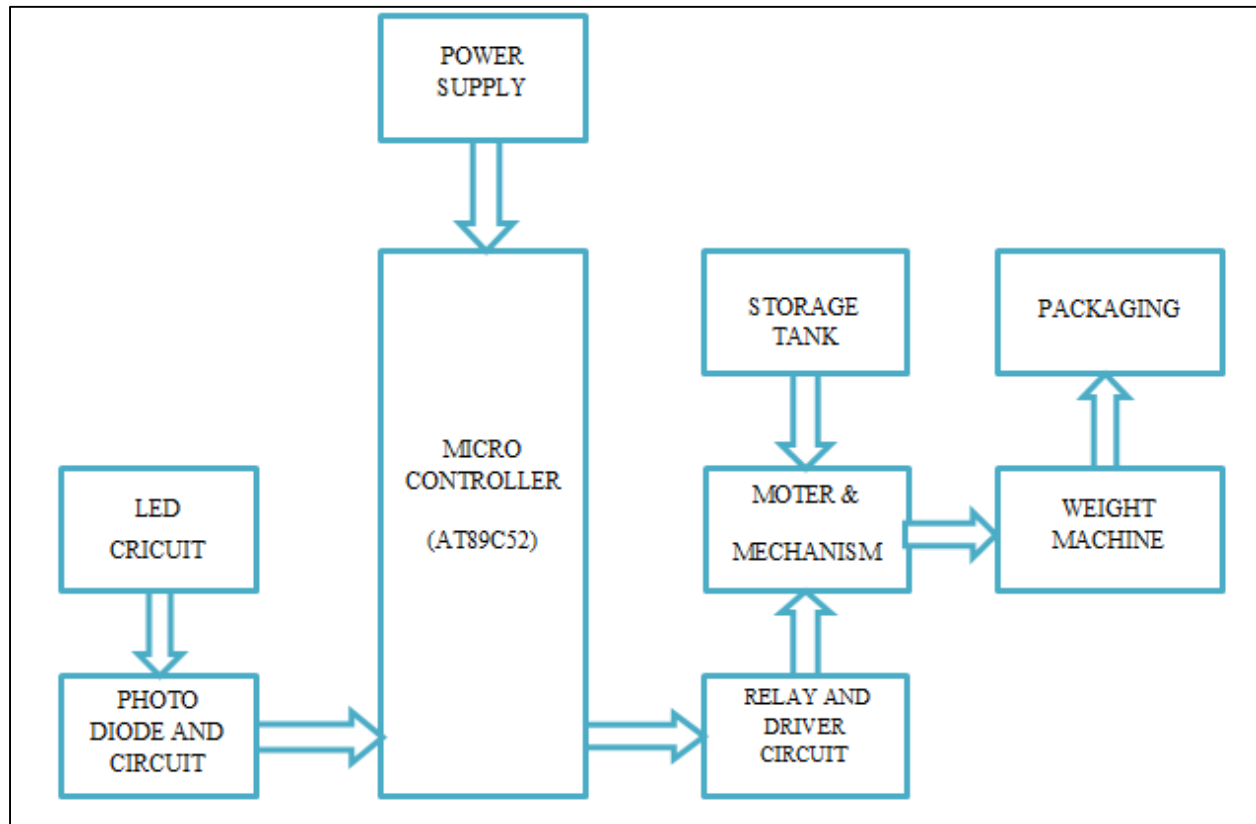
II. BLOCK DIAGRAM

Fig. 1: Block Diagram of EGM

Here, we use the three grocery bucket (Storage tank), First we designed the one grocery bucket for a particular grocery which gives the specific amount of the grocery. We use the LDR (Light Dependent resistor) or IR sensor. The IR sensor is continuously emits the light. The function of the IR sensor is whenever the object is appear in front of the IR that time light will reflect from the object to the IR sensor. So, that IR sensor gives logic '1' and logic '0' to the Microcontroller. We use AT89C52 Microcontroller which accept this signal as a interrupt signal and give acknowledgement signal to the motor mechanism.

A motor mechanism block contains flow control motor which used in the small flour milling device in the home. Motor accept the timing Management. We decide the particular time for particular amount of grocery. When desire amount of grocery available on the weighting cell instantly microcontroller give signal to the flow control motor than it will stop running. It indicate the desire grocery is available and requirement is fulfill.

III. CIRCUIT DIAGRAM

In above circuit diagram are made in proteus v7.8 and codding in micro 'c' software. The photo detector is input device and flow control motor is a output device. The IR sensor circuit is connected to pin no. P1.0 and Flow control motor is connected to the pin no. P1.1.The flow control motor is connected with relay driver. The relay driver is act as a switch. Whenever microcontroller gives LOGIC 1 that time relay act as a close switch and motor takes supply than it will start. When microcontroller gives LOGIC 0 that time relay act as a open switch so motor cant receive the supply so, motor is off.

When token is enter into the token mechanism, photo detector cut the light and gives the LOGIC 0 to the microcontroller which takes this signal as a interrupt signal and gives the acknowledgment signal at pin no.P1.1 at LOGIC 1. This logic is given to the current amplifier IC (ULN2003) which amplify the signal and give the high signal to the relay It act as a close switch. So, Motor will start the particular duration.
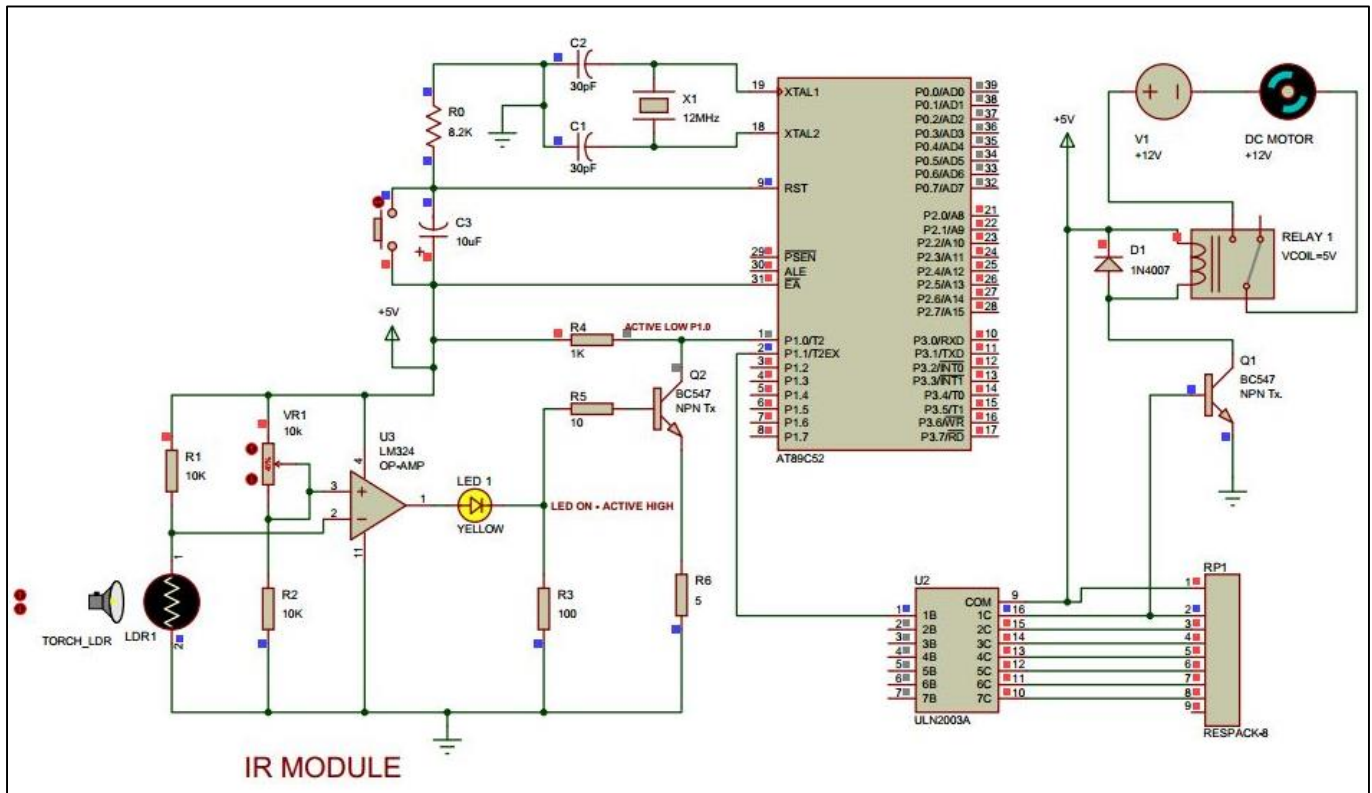
Fig. 2: Circuit Diagram of EGM

After specific duration motor will start. After some time pin no. P1.1 get LOGIC 0 and give to the relay and it will act as a open switch so, motor is off condition. Finally we get the desire amount of grocery from the weight cell.
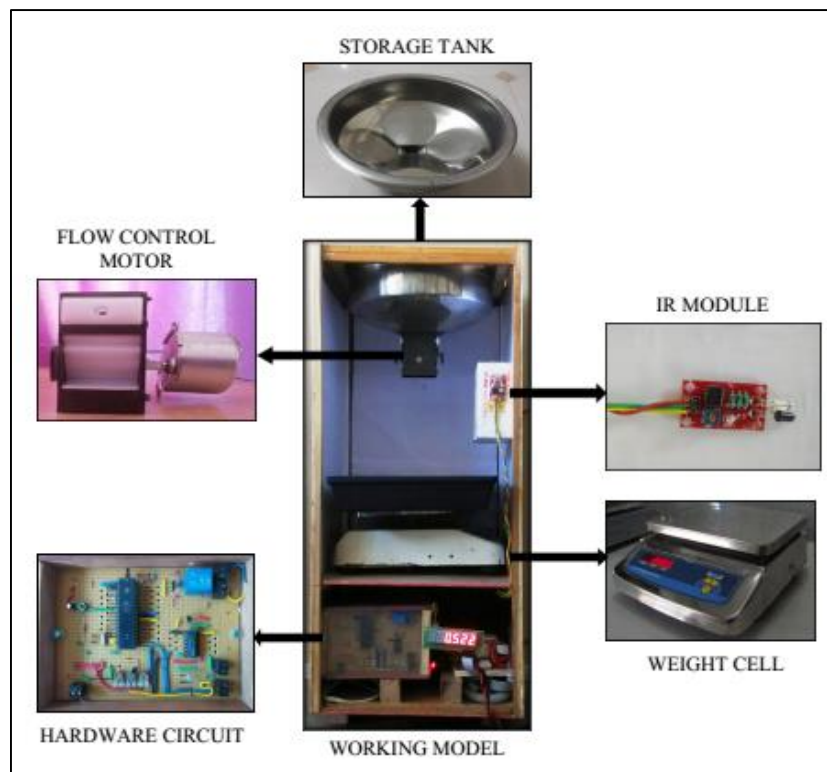
IV. WORKING MODEL

Fig. 3: EGM Working Model

In this machine buckets are filled up by different types of grocery. IR sensor or LDR for detecting light from the any object. The function of the IR sensor is it emits light continuously whenever any object passed out from the light at that time a little amount of light is reflected toward the photo detector. It generate the output signal either logic '1' or '0'. Tis signal is applied to the microcontroller it accept this signal as a interrupt signal.

Microcontroller (AT89C52) will gives control signal to motor mechanism or flow control motor. Depends upon output of IR sensor motor time duration is specified it means how much time motor is ON or OFF. The flow control motor is being started by getting control signal from microcontroller. So, The grocery which will filled in the bucket is comes on the weighting cell.

The weighting cell are continuously measure the flow of the grocery and indicate on the display. Whenever desire amount of grocery is comes on the weight cell it gives the output signal to the microcontroller.at that time it will gives the acknowledgement signal to flow control motor to stop it. Finally, we get specific and desire amount of grocery in our hand.
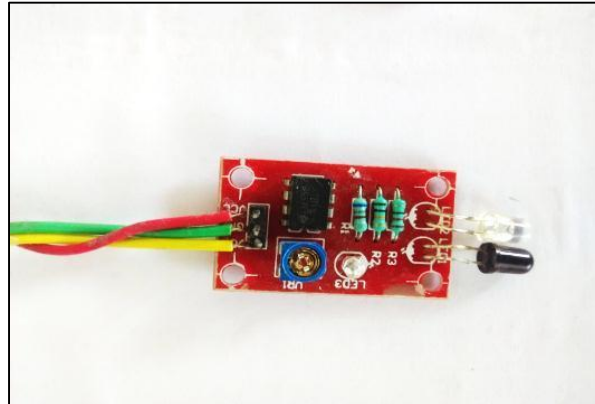
V. HARDWARE

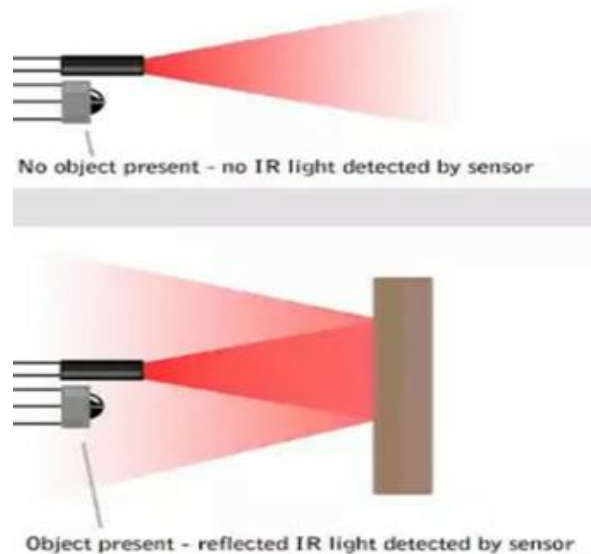### A. Token Mechanism:

Fig. 4: IR Module

Fig. 5: Infrared sensor [1]

Token mechanism consist of IR (Infrared) sensor or LDR which is works on the reflection principle. By using an LED which produce light at the same time any object are passed out in front of the sensor that time light is fall on the object and it will be reflected back to the IR. You can look the intensity of received light when any object are near or close to the IR sensor, So the light from the LED bounce off the object and into the light sensor. This light intensity is detected using threshold.[1]
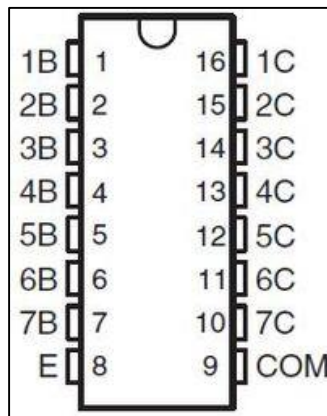
B. *ULN2003:*

Fig. 6: ULN2003 [2]

The ULN 2003 is a high voltage and high current carrying IC. It has a 16 pin IC. The drivers can parallel for high current output. It also used for interfacing with a stepper motor, where motor require high rating which cannot provide by another interfacing device. The use of the ULN2003 is in driver circuit for relays, lamp and display, stepper motors, buffer. etc.[3]

C. *Weighting Cell:*
Digital weighting machine is a heart of our project. It indicates the measurement of grocery. Recently demand of digital weighting machine is increased in our day to day life and also used most of the business enterprises. Because the grocery measurement is used friendly. The load cell is a uncontrollable weighting device.[5]

   In weighting machine spring balance or spring scale measure weight by using the force on the spring, where the balance using a balance beam compares mass by balancing the weight mass of an object. Unit of the force if newton and unit of the mass is kilograms. The pair of scales using a traditional balance beam to compare masses will read correctly.[6]
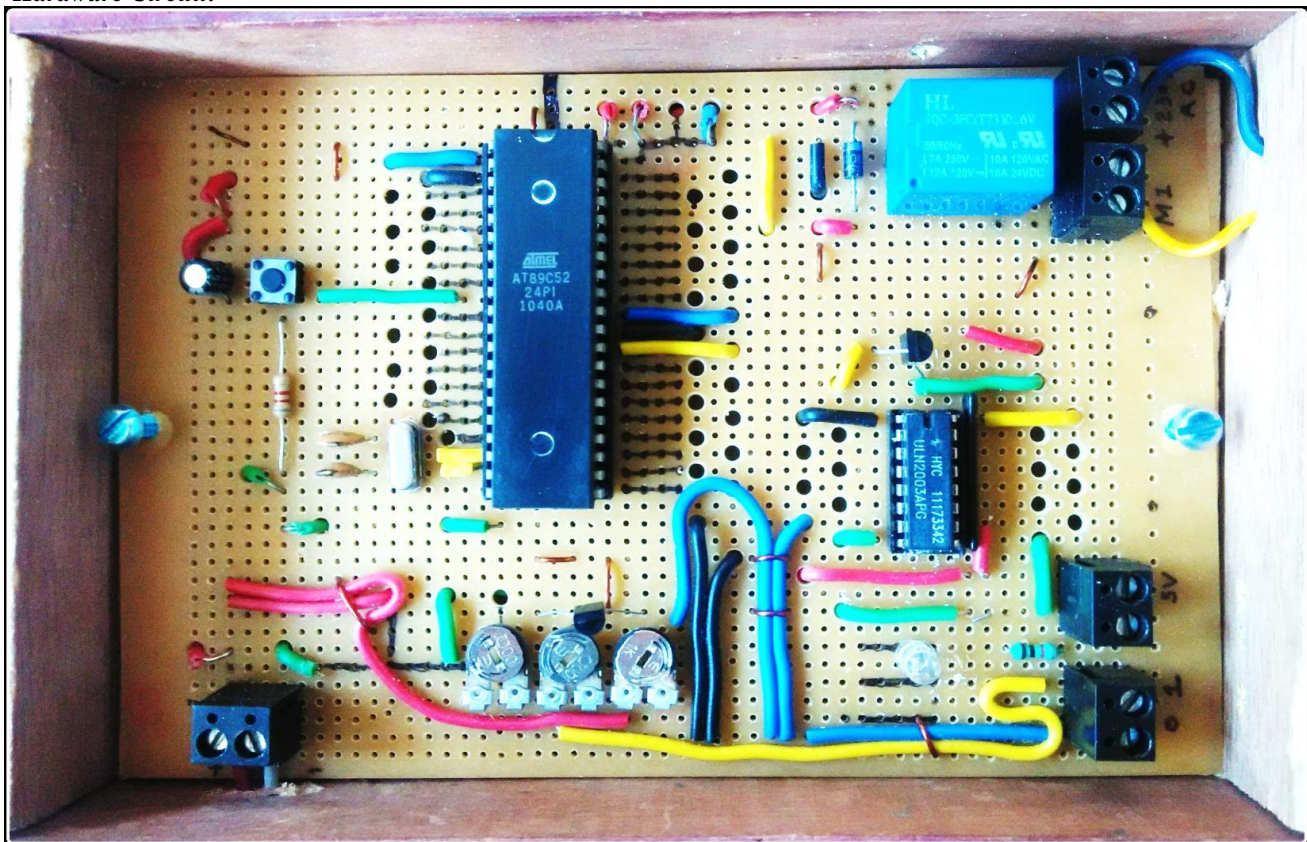
D. *Hardware Circuit:*

Fig. 7: Hardware Circuit

In this above circuit is a hardware circuit of EGM. When we put the token into token mechanism, The IR sensor are detect the token and gives the output LOGIC '1'. In idle condition all pin of microcontroller are having LOGIC'1'. But for getting a interrupt signal we having a logic '0',Because of that we use RTL(Resistor Transistor Logic) is use. The function of RTL logic is that when we give the LOGIC'1' at a input of the RTL that time it will give the LOGIC'0' like as NOT gate circuit.

This LOGIC'0' is applied to the P1.0 pin, Microcontroller accept this signal as an interrupt signal. Depends upon programming of microcontroller it will gives the LOGIC'1' for specific duration. The relay is connected with the P 1.1 terminal of microcontroller. Microcontroller allows to operates the relay for a specific time duration. The flow control motor connected with the relay. Whenever relay is operates that time flow control motor is also ON for a specific time duration. When it is OFF condition Motor is also OFF and we getting a accurate and desire output.

VI. MERRITS AND DEMARRITS

EGM has many advantages co`mpare to manual system such as, The output of the EGM system is less time consuming. It is also Beneficial for shopkeeper because it require less man power and gives high accuracy compare to the other manually measurement system. It required less space to store different types of grocery. This system is fully automatic but one person is required to handle it So it reduces the requirement of man power. Measurement process is faster than manually process. Used for vegetables, Fruits, Nuts, etc.

The main disadvantage of EGM is that whenever the power failure condition is occur the machine can't work that's why we required one UPS (Uninterrupted Power Supply) system Also Minimum one person is required to operate this machine. When number of grocery will be increased that time it very difficult to stored it.

VII. APPLICATION

EGM has many application such as, Government ration shop, Shopkeeper, Hotel or caterers, Retailer, Wholesaler, Dealer, Chef, Distributer, consumer etc.

VIII. FUTURE SCOPE

In future EGM system implement by RFID card, swiping card, ATM card etc. We also implement the output of grocery in packet form.

IX. CONCLUSION

We make a machine which gives desired and accurate amount of grocery which is very beneficial for society and Shopkeeper and better utilization of manpower. By applying digitization concept we include high accuracy, less time consumption and also reduce the corruption in government grocery shop and private ration shop.

ACKNOWLEDGEMENT

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[5]   International   Journal   of   Innovative   Research   in   Computer   and   Communication   Engineering (http://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&sqi=2&ved=0ahUKEwinupmgoOLKAhWLj44KHY_tDyIQFggbMAA&url=ht tp%3A%2F%2Fwww.ijircce.com%2Fupload%2F2013%2Foctober%2F29Design.pdf&usg=AFQjCNFbXnKLrr4cXSWFHoPBTs2iEYCS cQ&bvm=bv.113370389, d.c2E)
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