Automatic Shopping Trolley using Sensors

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Abstract - *Now a day moving a shopping trolley is difficult task to do in malls and shopping areas because of heavy weight of stuff. So, to overcome this problem we are introducing a new idea called "Automatic moving shopping trolley using sensors". With the use of these trolley customers can enjoy their shopping and pay more attention on their shopping list without the need of pushing shopping trolley. As we see in a shopping mall or grocery malls like big bazaar and D-marts; there are trolley available but they are manually operated.*

For the ease of customers we are developing automatic moving shopping trolley using sensors. Sensor on the trolley will track the customer and keep moving. If the customer stops the trolley will also stop at maintained distance. After total purchase one needs to go to billing counter for payments. At the billing counter there is a long queue. The system of billing will be placed in the trolley. It will consist of RFID Reader.When a person puts any product in a trolley its code will be detected using RFID Reader attached with the trolley. As we put the product the cost will get added to the total bill. Thus, billing will be done in trolley itself. It will be displayed on LCD.

*Key Words***: Automatic Shopping Trolley, IR sensors, DC motor, LCD 16X2, RFID EM18.**

1.Introduction

Moving a trolley is really difficult task to do in malls and shopping areas. Customers have to stand in queue for very long time for billing as on the counter, the person will make bill for each and every product one by one which will consume lots of time. So, to overcome these problems we are introducing a idea called "Automatic Shopping Trolley using sensors". Our trolley will move automatically using sensors. We are using IR sensors and for motion we are using DC motors [1]. When a customer puts any product in a trolley its code will be detected using RFID Reader attached with the trolley. Thus, Customer can keep the track of the total amount. It will be displayed on LCD [2].

2.Problem Definition

Now a day purchasing and shopping at big malls is becoming a daily activity in metro cities. We can see huge rush at malls on holidays and weekends. It seems too hectic to push the trolley till entire shopping is done and after that customer have to wait in the queue for billing. To overcome these issues or to ease this we are proposing our project, in which customer need not to concentrate on the movement of trolley as Trolley will move automatically following the sensors. Not only this, our trolley will have the RFID reader so that customer can keep track of billing.

3.Objective

The main objective of our project is to make shopping more easy and comfortable for each and every customer by providing them many facilities right in their trolley. Trolley will move after the customer at the maintained distance.

Once the shopping is done one has not to wait in the queue as the trolley will have RFID Reader attached. The customer's trolley will have the total amount displayed on the LCD which will be then tracked by the man on the counter. So the time will be consumed less.

4.Block Diagram

In our Project we are using Dc motors, RFID, LCD, IR sensors. The above Figure is the proposed block diagram of our project.

A motor is an electrical machine which converts electrical energy into mechanical energy. The principle of working of a DC motor is that "Whenever a current carrying conductor is placed in a magnetic field, it experiences a mechanical force".

In a basic RFID system, tags are attached to all the items that are to be tracked. These tags are made from a tiny tag chips, sometimes called as an integrated circuit(IC) that is connected to an antenna that can be built into many different kinds of tags including apparel hang tags, labels and security tags as well as a wide variety of industrial asset tags [3]. The tag chip contains memory which stores the product's electronic product code (EPC) and other variable information so that it can be read and tracked by RFID readers anywhere. An RFID reader is a network connected device (fixed or mobile) with an antenna that sends power as well as data and commands to the tags. The RFID reader acts like an access point for RFID tag items so that the tags data can be made available to business applications. In our project we are using EM-18 RFID.

An infrared sensor is an electronic instrument which is used to sense certain characteristics of its surroundings by either emitting or detecting infrared radiations. Infrared sensors are also capable of measuring the heat being emitted by an object and detecting motion. In our project we are using IR sensors to detect the customer.
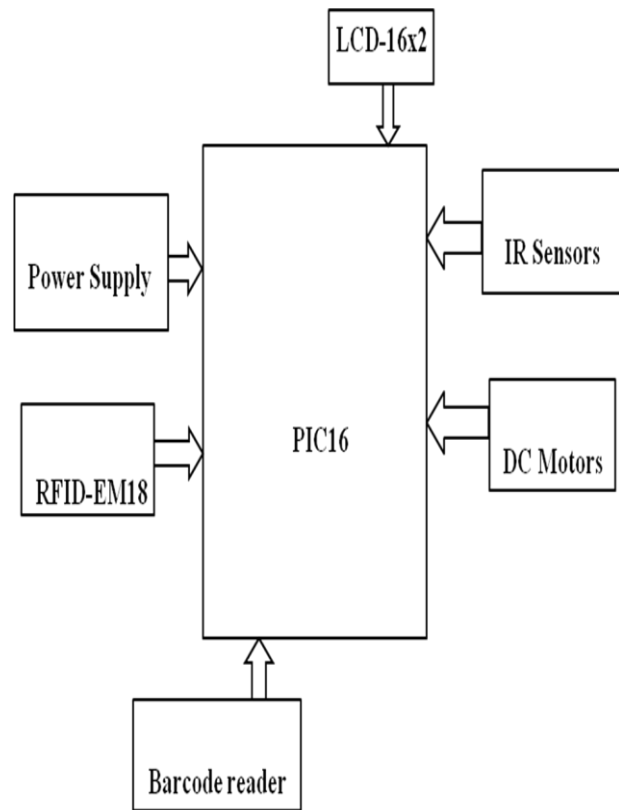

A liquid crystal display(LCD) draws its definition from its name itself. It is a combination of two states of matter, the solid and the liquid. LCD uses a liquid crystal to produce a visible image. Liquid crystal displays are super-thin technology display screen data generally used in laptop computer screen, TVs, cell phones and portable video games. In our project we are using LCD to display the total amount of the purchased items.

5.Simulation

The below simulation is of our project. Here we have attached LCD to one port of PIC to display total amount. DC motors are connected to another port to drive the trolley. RFID code is given to some stuff and RFID reader will read that code and adds the respective amount to the bill.

For DC motors we have used additional power supply. The sensors are attached to one port of the PIC. They will sense the coming infrared signal and the trolley will move in that direction.
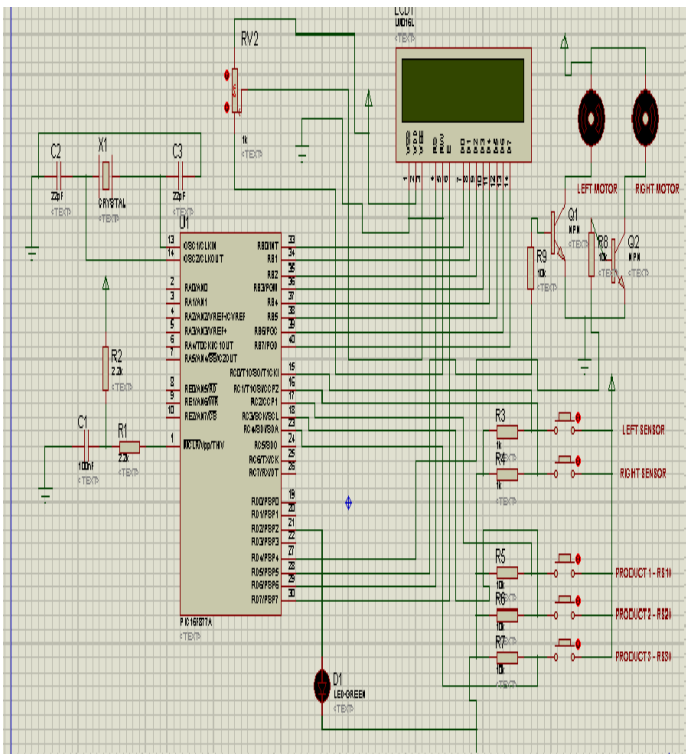
6.Conclusion

The project is developed with low cost, low power consumption. With our project costumers can enjoy shopping without pushing shopping trolley themselves. We are using sensors on the trolley which will track the human and will move at the maintained distance. It will stop when the customer will stop and there is a RFID reader fixed on the trolley to keep the track for the total amount.
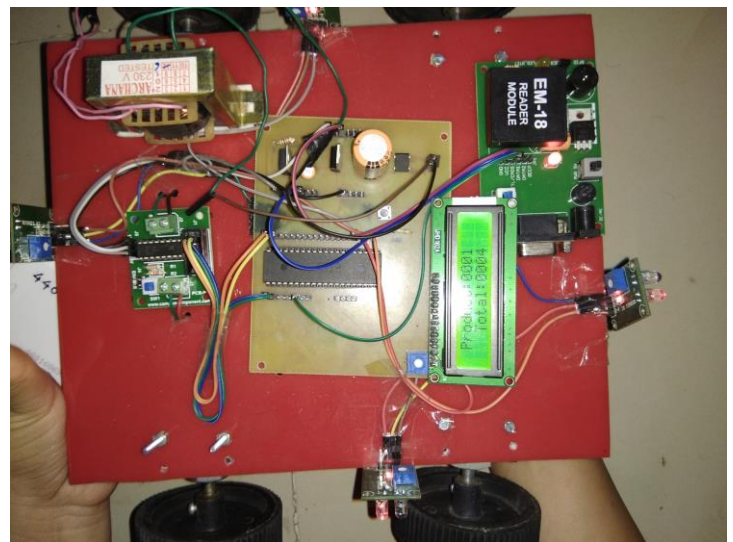
7.Future Scope

In future we can use different sensor through which it can detect directly human and move after customer. Also, we can use more number of DC motors to carry more and more stuff. We can make a container type carrier so that small kids can sit and no mess will be there.

8.Acknowledgement

9.Results

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