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A NOVEL TROLLEY ROBOT FOR SHOPPING AND BILLING IN SUPERMARKET

Mr.M.Prabakaran[1], Mr.T.Silambarasan[2], Mr.S.Ezhilarasan[3], Mr.M.Sudhakaran[4],
[1,2]UG student,dept of EEE,Ganadhipathy Tulasi's Jain Engineering College, Vellore ,India,
[3]Assistant professor,dept of EEE,Ganadhipathy Tulasi's Jain Engineering College, Vellore ,India,
[4]Associate professor,dept of EEE,Ganadhipathy Tulasi's Jain Engineering College, Vellore ,India.

Abstract

Shopping trolley is a necessary tool for shopping in supermarkets or stores. However, there was shopping trolley abandoned everywhere in the supermarket after being used. In addition, there were also shopping trolley safety issues such as sliding down from an escalator. On the other hand, it is inconvenient and time wasting for customers who are in rush to search for desired products in a supermarket. Therefore, an automatic human and line following shopping trolley with a smart shopping system was developed to solve the problems. A line following portable robot was installed under the trolley to lead the users to items location that they plan to purchase in the supermarket. Finally, users can enjoy shopping and pay more attention on their children during shopping without the need of pushing the shopping trolley. Besides, they can track the purchased items easily. Meanwhile, supermarket owners can save cost from hiring trolley collector. In our proposed system, Smart trolley Robot will follow the customer by capturing the unique logo which is placed in the customer shirt using the webcam through Open CV. Here RFID reader is used to add up the purchased item to the cart. The purchased item list will also be display in the LCD display.

Keywords: PIC micro controller ,motor drive circuit ,dc motor, web cam ,Rfid reader ,Lcd.

1. INTRODUCTION

Shopping involves visiting a particular shop or mall, selecting a product, add it to cart and wait in a long queue to get the items scanned so that a bill can be generated. Then the customer pays the amount. This leads to a lot of wastage of time of the customer, also labor cost is high. The barcode technology is being used these days, one can observe that barcodes are seen almost on every item. Barcodes are a universal technology in that they are the normal for retail products. Stores which own a barcode reader can process the barcodes and imprint it on the products. In our proposed system, Smart trolley Robot will follow the customer by capturing the unique logo which is placed in the customer shirt using the webcam through Open CV. Here RFID reader is used to add up the purchased item to the cart. The purchased item list will also be display in the LCD display.

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2. PROPOSEDMETHOD

In our proposed system, Smart trolley Robot will follow the customer by capturing the unique logo which is placed in the customer shirt using the webcam through Open CV. Here RFID reader is used to add up the purchased item to the cart. The purchased item list will also be display in the LCD display. Web cam follow the symbol rfid reader use to parches item read. Motor driver circuit controlled the motor Lcd using calculate total amount.

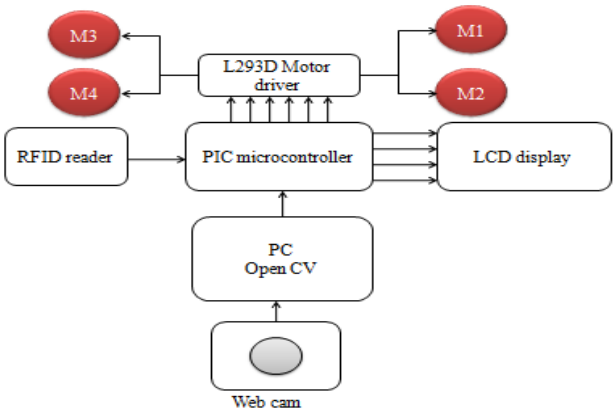

Fig.1. Block Diagram of Proposed system

3. DESIGNANDIMPLEMENTATION

A.Web Camera

The image can be captured by using Index IT- 306WC webcam. The camera resolution is up to 30 MP .It is connected to the USB port.

B. Motor Driver Circuit

The motor driver circuit is a low current amplifier that drives the DC motor. The GPIO pins are made high o r low according to the user input. This input is used to control the robotic vehicle movements.

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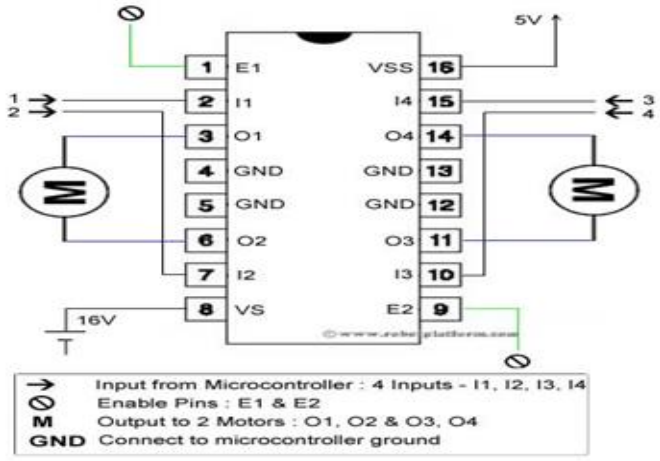

Fig.2. Motor driver circuit

C. DC Motor

` The motor driver circuit has capable of power the DC motors, which in turn controls the movements of the robotic vehicle. It has the voltage of about 5volt and current is about 600 milli ampere.

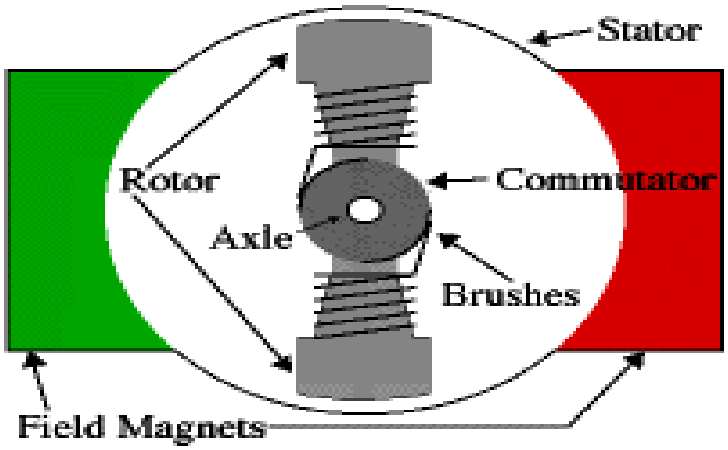

Fig.3. DC Motor

D.Buzzer

Electronic symbol for a buzzer. A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

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E. RFID Reader

Fig.4. RFID reader

Radio Frequency Identification (RFID) Card Readers provide a low-cost solution to read passive RFID transponder tags up to 7 cm away. This RFID Card Reader can be used in a wide variety of hobbyist and commercial applications, including access control, automatic identification, robotics navigation, inventory tracking, payment systems, and car immobilization. The RFID card reader read the RFID tag in range and outputs unique identification code of the tag at baud rate of 9600. The data from RFID reader can be interfaced to be read by microcontroller or PC.

F.LCD

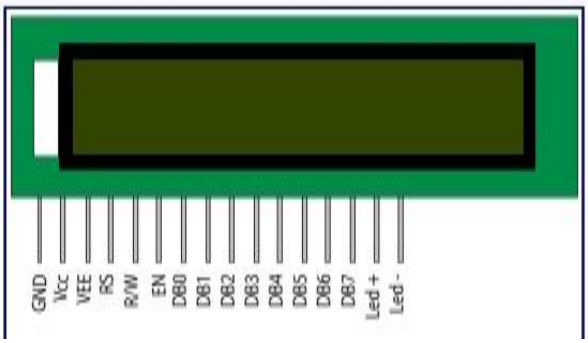

Fig.5. LCD display

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LED.

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G.PIC MICROCONTROLLER

Peripheral Interface Controller (PIC) was originally designed by General Instruments. In the late 1970s, GI introduced PIC 1650 and 1655 – RISC with 30 instructions.PIC was sold to Microchip Features: low-cost, self-contained, 8-bit, Harvard structure, pipelined, RISC, single accumulator, with fixed reset and interrupt vectors.

4. CIRCUIT DIAGRAM

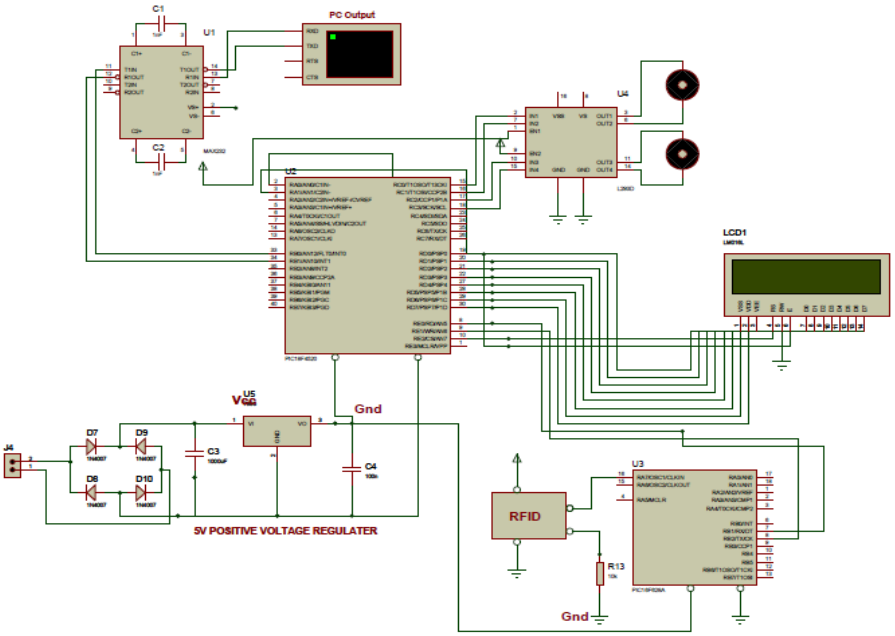

Fig.6. cicuit Diagram

This system consists of facilities to rectify the items in the cart using RFID which adds up the items and represent the no. of items in the cart and amount should be paid for that.If in case, the customer misplaced the items without scanning the system detects the fault made by the customer and displays in the LCD and server. A buzzer is also enabled to notify the fault. The inventory details are updated in the database to calculate the quality management of the shopping centre

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5. SIMULATION RESULT

A.RISE ADDED 100 RS

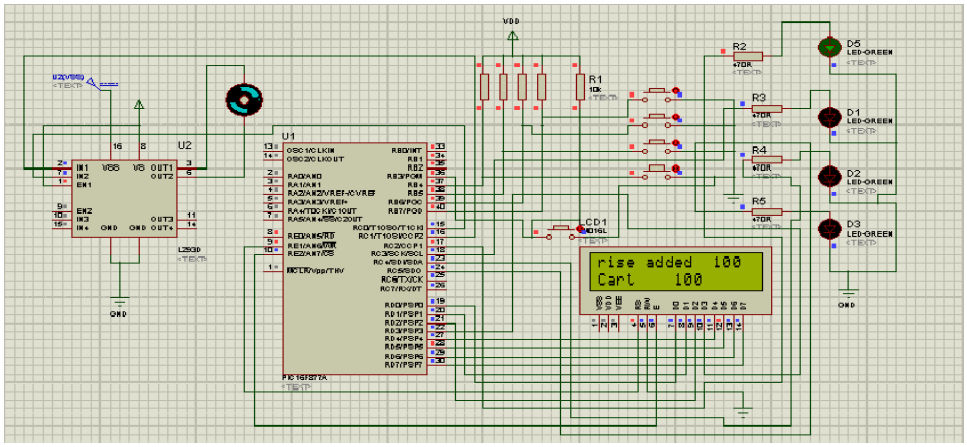

Fig.7.Rise added 100rs

B.DHALL ADDED 50RS

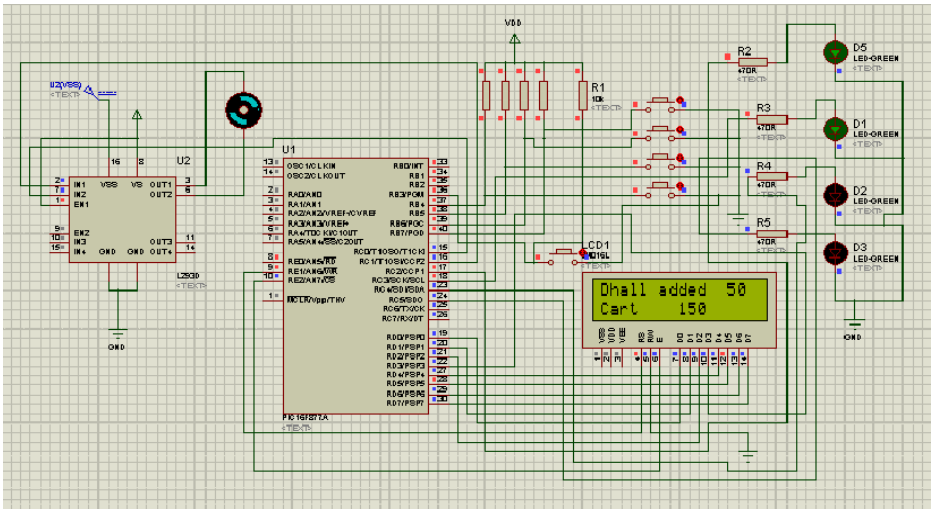

Fig.8. Dhall added 50rs

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6. HARDWARE KIT

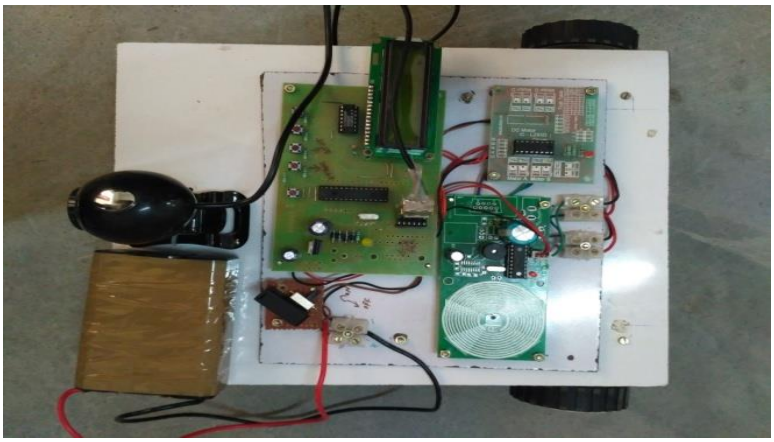

Fig.9. Hardware Diagram

CONCLUSION

Smart Intelligent System for Shopping and Billing can have the best solution over money loss at shopping centers and also to reduce the delay and congestion indirectly resulting in reduction of time at the billing.In this system, the technique such as Radio Frequency Identification is introduced. This technique will include the RFID tag & reader, which in coordination with each other can be used to detect the total bill amount of individually. By effectively utilizing these techniques at different stages of this project is able to represent smart billing and which will reduce the complete processing time by few seconds, which is very important as well as it helps to reduce time and comfort the customers in a very cost effective manner. This system gives all in one solution to manage a shopping centre.

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