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Goods Carrier with Inbuilt Billing and Packing System for Super Markets

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ABSTRACT: Normally, in our day to day life there is no time for waiting in the billing and packing counter in super markets. This problem can be avoided by designing a system which provides inbuilt billing and packing in trolley itself. A Radio Frequency Identification Tag is given to the customer while entering the super markets. With use of the RFID tag the customer can take the allotted trolley by scanning the tag in the RFID reader attached to the trolley. Products are placed in the trolley only after scanning in the barcode scanner. Once the purchasing gets over the LCD displays the number of products and total amount of products purchased, the customer can pay the bill amount by swiping their credit or debit cards in the swipe machine fitted in the trolley. After paying the bill the products are packed automatically.

KEYWORDS: RFID tags, RFID reader, Barcode scanner, LCD, swipe machine.

I. INTRODUCTION

In today's world super market is the only place where people can take all their daily accessories such as clothing, electrical appliances, groceries, stationary etc. The demand of super markets is increasing day by day because all the necessary things are available under one roof. If a customer wants to buy a thing in super markets they should pick the particular product from the display shelf and have to wait in a long queue for making payment. This will leads to rising of problems in large super markets. Besides customer should also wait at the cash counter for paying the bill and packing the products. This process surely takes plenty of time. Sometimes customers may worry that the amount of money is not enough to pay for the products purchased.

This can be avoided by using credit or debit card payment. To overcome the above stated problems, we are implementing a GOODS CARRIER WITH INBUILT AND PACKING SYSTEM FOR SUPER MARKETS. This can be achieved by using the barcode scanner, RFID reader, driver circuit, Liquid crystal display (LCD) which are connected to the Peripheral Interface Controller (PIC). By using this system the customer will have accurate information about the number of items purchased and the total price of the products purchased. The main aim of our project is to minimize the time taken in billing counter in super markets and to lower the manpower requirement with increase in efficiency. This method also provides a convenient way of shopping. Consumers can avoid spending their precious time at cash counter.

II. LITERATURE SURVEY

If a customer wants to buy something in a super market, customers need to take the required items from the display shelf and then they have to wait in a long queue to make their payment. Customers have to wait in a queue for scanning every single product which is a time consuming process. To avoid the above specified problems several billing systems were developed. [2] A system designed as an automated moving trolley using microcontroller based system along with an object counter, optical sensor, RF transmitter and RF receiver. Though it provides a reduced

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system for billing it consumes more time for packing. [3] is a system which consist of three modules integrated by a embedded system provides information about the cost details of the products, but it does not provide more time reduction in billing and packing. Another system which is mainly designed for billing known as [7]. It consists of two barcode scanner at entry and exit point provided with an inbuilt wireless transmitter. But this system is very expensive on large scale. It also requires a battery backup for providing power to the trolley when it runs out of power. A system [6] defines automatic billing system using Li-Fi module with mobile banking.

III. EXISTING SYSTEM

In existing system there is a necessity of manual power for calculating the bill of the every product bought by the consumer. To overcome these problems stated above, in the existing system a system known as AUTOMATED SHOPPING TROLLEY was designed. This can be implemented by attaching the RFID tags to the products and a RFID reader with a LCD display on the trolley. By means of this system the customer will have the information about price of every item that are scanned in, total price of the item and also brief about the product. This system will save time of customers and manpower required in mall and cost associated with the product. As soon as the shopping is over the user comes near the billing section. The total bill will be displayed on the billing computer by using ZIGBEE wireless technology. Though it reduces time consumption in billing, this method does not focuses on packing, thus there is a need for manual power as usual.

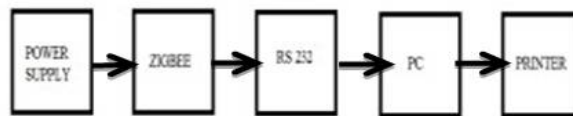


Fig 1: block diagram of billing section

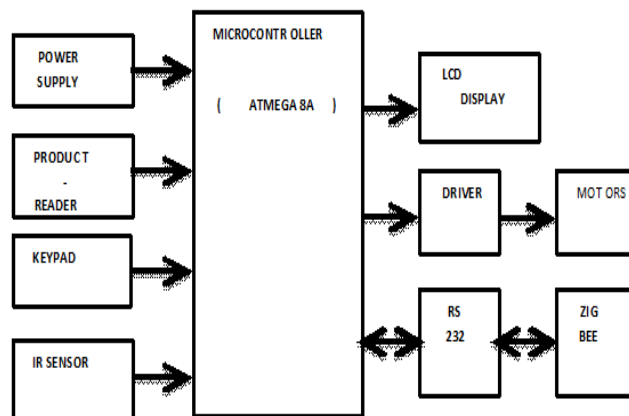


Fig 1.1: existing system block diagram

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IV. PROPOSED SYSTEM

In this system we propose a new way of shopping in the trolley itself. A system with automatic computation of bill for the accessories purchased with automatic packing is designed effectively. It is implemented using RFID tag and reader, PIC controller, barcode scanner, LCD, DC motor, swipe machine.

SOFTWARE USED

- Embedded C
- PCW Compiler

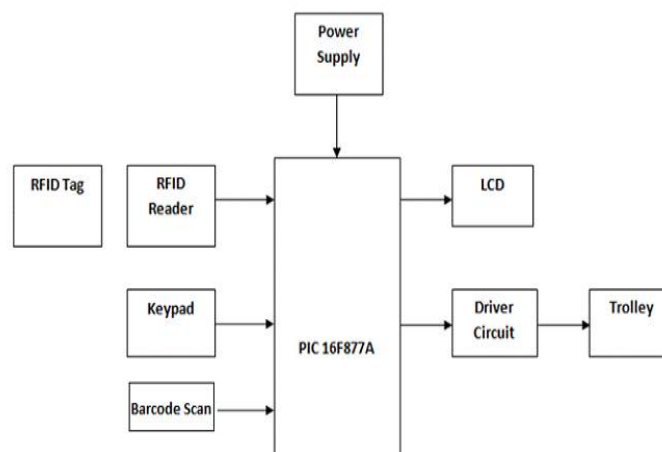


Fig 2: block diagram of billing section

1. PIC CONTROLLER

PIC is a family of Harvard architecture microcontrollers made by Microchip Technology, derived from the PIC1640. Originally developed by General Instrument's Microelectronics Division. The name PIC initially referred to "**Programmable Interface Controller**".

The Peripheral Interface Controller 16F877 is a family of 8bit microcontrollers which has a 8kb flash memory for storing a program. The flash memory is a reprogrammable memory that is, the program can be erased more than once. The main advantage of using PIC controller is it is of low cost and occupies less space. The data will not be lost when there is no power supply. It follows the RISC architecture, the operating frequency of the PIC is 0-20MHz. It has a power supply voltage of 2.0-5.5volts. It has 35 input and output pins. The chip can be reprogrammed up to 1000000times. It also contains an analog to digital converter. The ADC converter in PIC controller has 14 channels with 10-bit resolution which is another advantage.

It is usually used for storing important data that must not be lost if power supply suddenly stops. For instance, one such data is assigned as temperature in temperature regulators. If during a loss of power supply this data was lost, we would have to make the adjustment once again on return of supply. It also has 3 independent timers or counters. It has Brown-out-reset with software control option. Peripheral interface controller is less in cost and occupies less space.

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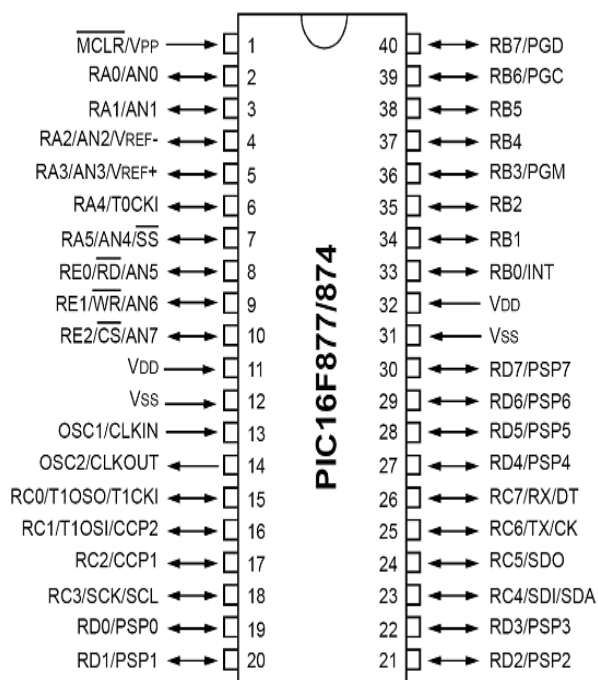


Fig 2.1: Pin diagram of PIC controller

2. LIQUID CRYSTAL DISPLAY

LCD which can be abbreviated as Liquid Crystal Display is an electronic display module which is used for a wide range of applications. A 16*2 Liquid Crystal Display is one of the basic module which is widely used in various devices and circuits. LCD is preferred to seven segment display because of the following reasons,

- The LCD's are economical.
- They can be easily programmed.
- There is no limitation of displaying special characters.

It consists of two registers, a command register used to store the command instruction to the LCD and a data register that stores the data to be displayed on the LCD. Here the LCD is used for displaying the number of product purchased and for displaying the total cost of the total products purchased.

3. POWER SUPPLY

The power supply circuit constructed using rectifiers and filters, a step down transformer is used here which transforms the high voltage AC in to low voltage DC. The rectifier is generally used to rectify the AC voltage in to a DC voltage. The reason for using the diode in the rectifier block is because it does not have the capacity to handle high voltage from AC mains. The direct current from the rectifier flows in only one direction.

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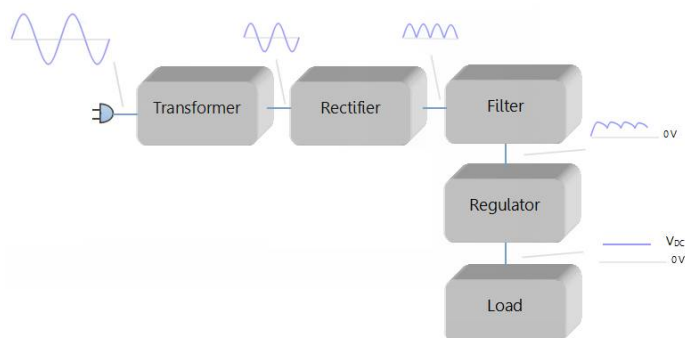


Fig 2.2: Power supply internal diagram

4. RFID TAG AND READER

The radio frequency identification system is composed of transponders and labels or tags that are attached to the objects to be identified it is generally used for access control, contactless payment systems, product tracking and inventory control.. Readers are interrogators read the response of the tag by sending a signal to the tag. RFID tag is of three types-passive type, active type and battery assisted passive type. A passive tag is of small size and very cheap because it has no battery. Passive tags do not need any power source because it uses radio wave as a power for its operation. They provide high performance at low cost. RFID reader is generally used to read the information in the RFID tag. It consists of RF module, antenna and control unit. They can be hand held in strategic locations so that they can able to read the RFID tag. RFID are used in variety of application such as locating lost items, tracking moving objects and others.



Fig 2.3: RFID module

5. BARCODE SCANNER

It is an electronic device that can read and output printed barcodes to a computer like a flat bed scanner it consists of a light source, a lens and a light sensor translating optical impulses in to electrical ones. Barcode scanner consists of black and white strip. Black strips absorbs the light transmitted by the transmitter and does not reflect back. Whereas white strips reflects the light rays this is the basic working principle of barcode scanner. Additionally, nearly all barcode scanners contain decoder circuitry analyzing the barcode's image data provided by the sensor and sensing the barcode's content to the scanner's output port.

6. SWIPE MACHINE

The WI-FI based swipe machines have contactless payment as standard. The technology offers our customer a revolutionary new way of accepting card payments. WI-FI card machines connect directly to the wireless router and



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therefore cables are not required. The card machine can then be used anywhere in range of the WI-FI signal. This ensures both staff and customers are provided with the fast and convenient way to pay. These machines are fast and reliable to operate. It provides safe and secure card reading and pay at table connectivity.

V. PROCESS METHODOLOGY

The customer entering the super markets are provided with a RFID card. The customer scans the RFID card with the RFID reader which is fitted in the trolley. The trolley is composed of two sections billing section and packing section. The door at the billing section will open only when the product is scanned and the door in packing section will open after the payment is done. So after getting the allotted trolley the customers can pick the products in the display shelf, they can drop the product in to the trolley only after scanning the barcode of the product in the barcode scanner. The doors of the trolley get open after the scanning. By the mean time the number of items/products purchased is display in the LCD. The total amount of products purchased is also display in the LCD. After purchasing, the OK button is pressed and the amount can be paid through credit or debit cards by swiping in the swipe machine attached to the trolley. Further the products are sent to the packing section which consists of large number of polythene bags, which packs the products automatically

ADVANTAGES

- Avoids long queuing at billing section.
- Reduces manpower
- This technique is efficient, compact and shows promising performance.
- It consumes less time.

VI. CONCLUSION

By means of this paper we provide a peaceful purchasing to the customer. The confusion at the packing and billing counter can be avoided. And there is no need of thinking about budget. Different kind of parameters such as product name, product cost, total amount are all displayed. This project takes shopping to a different level.

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