Super Market Billing System Using RFID

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Abstract: The Automated Shopping Trolley is a Smart Trolley which integrates a Embedded Chip with RFID reader with tag and a Battery kit to allow users to self-checkout at Super Markets.

Keywords: Super Market Billing System, Smart Trolley, RFID, Automated Shopping Trolley.

1. INTRODUCTION

Nowadays, if a consumer would like to buy something at a shopping mall, consumers need to take the particular items from the display shelf and then queue up and wait for their turn to make payment. Problem will surely arise when the size of a shopping mall is relatively huge and sometimes consumers don't even know where certain items are placed. Besides, consumers also need to queue for a long time at the cashier to wait for turn to make payment. The time taken for consumers to wait for the customers in front of the queue to scan every single item and then followed by making payment will definitely take plenty of time. This condition will surely become worst during the season of big sales or if the shopping mall still uses the conventional way to key in the price of every item by hand to the cash register. On the other hand, consumers often have to worry about plenty of things when going to the shopping mall. While doing survey we found that most of the people prefer to leave the shopping mall instead of waiting in long queues to buy a few products. People find it difficult to locate the product they wanted to buy, after selecting product they need to stand in a long queue for billing and payment. To try to solve the problems previously identified, recent years have seen the appearance of several technological solutions for hypermarket assistance. All such solutions share the same objectives to save consumers.
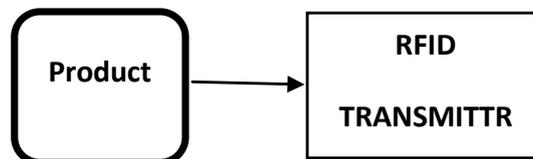
2. BLOCK DIAGRAM

1. PRODUCT SECTION

Fig 3.1 Block of Product section
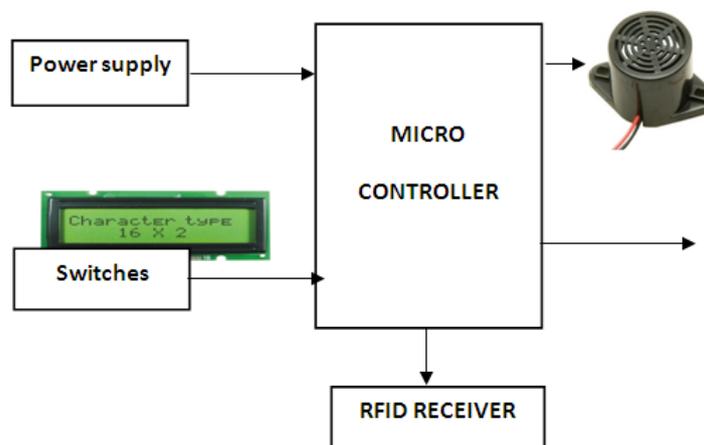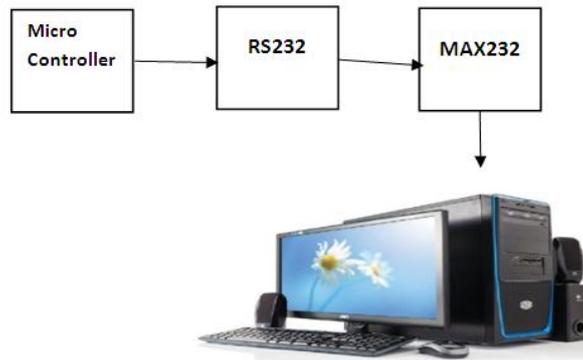
2. CONTROLLER SECTION

Fig 3.2 Block of controller section

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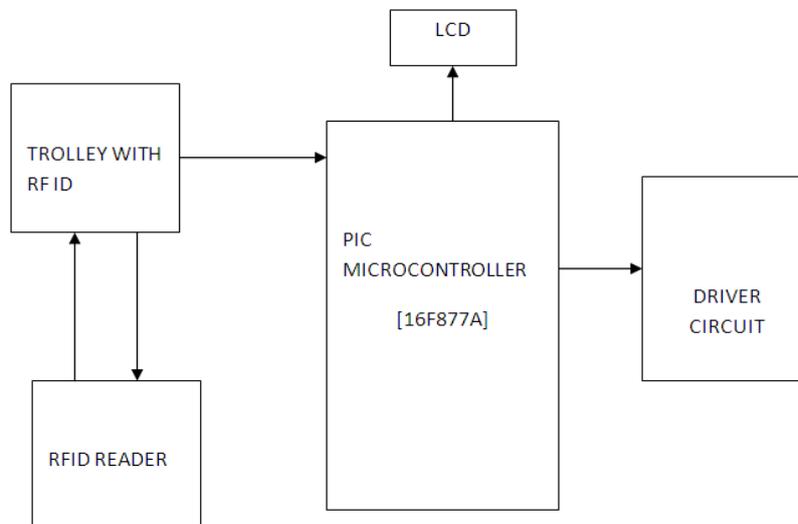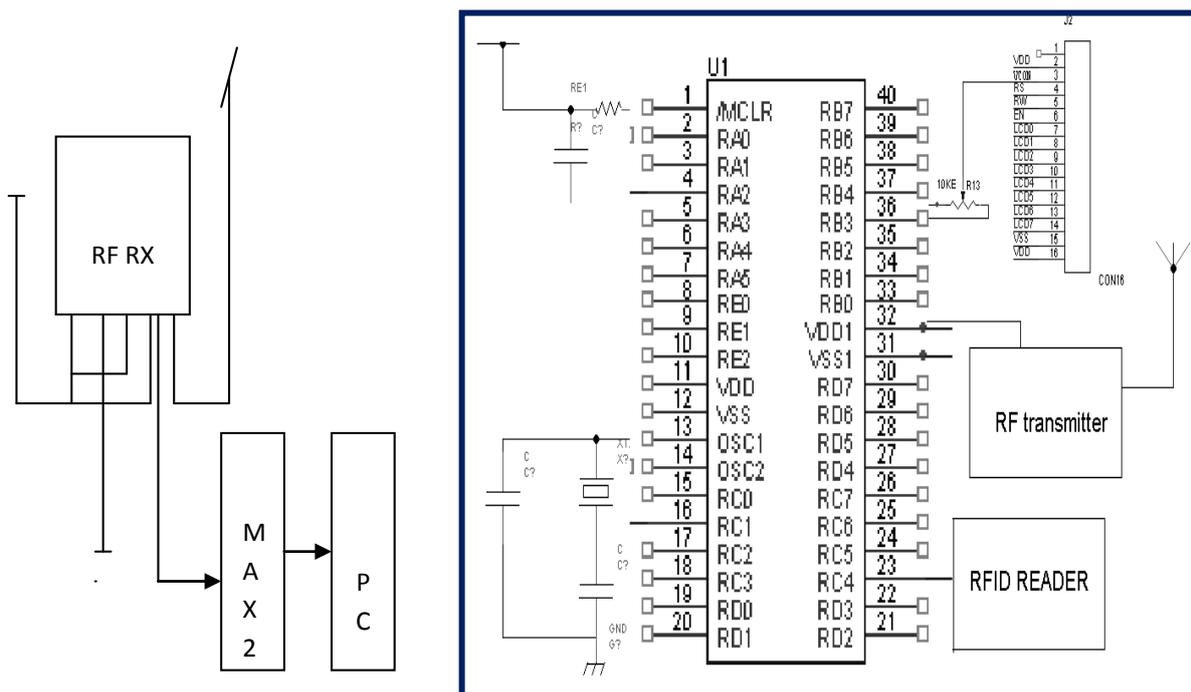
3. BILLING SECTION

COMMON BLOCK DIAGRAM
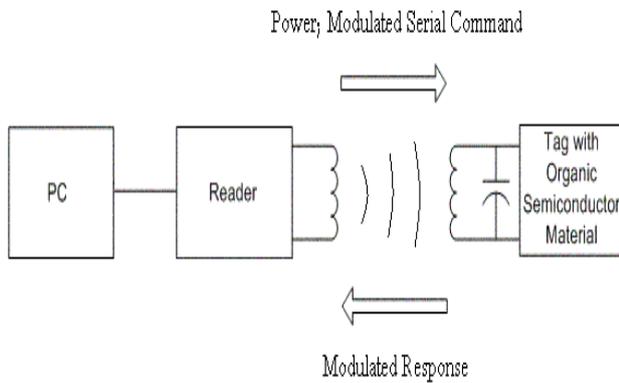

Fig 3.4 Common Block diagram

CIRCUIT DIAGRAM
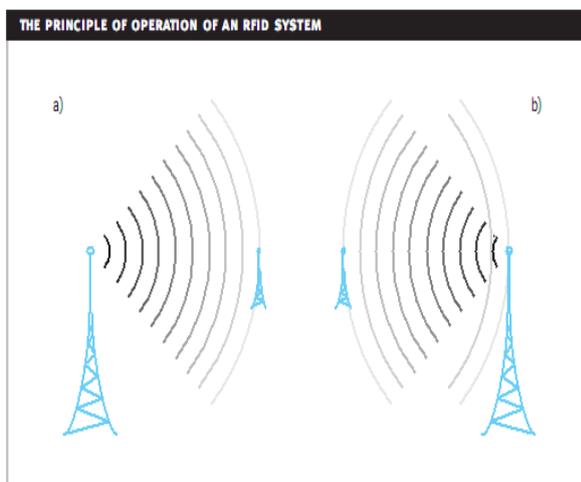
WORKING PRINCIPLE

With an RFID system, the term range naturally refers to the maximum operating distance between the reader antenna and the tag, and the field of the reader is the specific operating area. The frequency of operation used for an RFID system has a big effect on the operating range. Analysis of the physics of RFID communications shows that the optimum frequency is around 400-500MHz . Such analysis cannot be made generically - there are a number of factors to take into account and these will have different effects based on the intended application.

Example factors that will be affected by the choice of frequency include: size of tag antenna, ease of power delivery to the tag, ease of communication of tag back to reader, cost and speed of communication.

The range of RFID systems operating in the UHF band is governed largely by the principles outlined. This means that the ability of the reader to power and communicate to the tag is based on the inverse square law $(1/r)$, as it will be the return path of reflected signals from the tag to the reader. Operation will also be affected by environmental conditions and interference from other radio sources at the same frequency. RFID systems that operate in the HF band of the spectrum work in a very different way to those using the UHF band and it is useful to understand this fundamental difference and the effect it has on operating range.
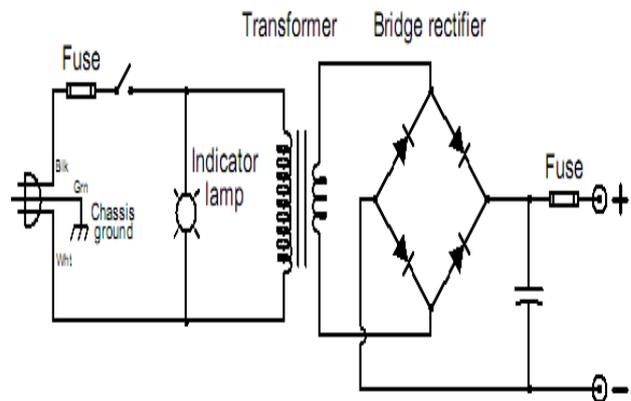
If communication occurs over a short distance, relative to the wavelength of the radio wave, this is said to be near-field operation. Since HF (3-30MHz) RFID systems use waves with a wavelength of around10-100m, if the distance of the communication is much less than this (which is the case in RFID) then this is a near-field communication. Near-field communication is based on a magnetic field effect, which has an inverse sixth power $(1/r)$ relationship with range.

OPERATION OF POWER SUPPLY

The operation of power supply circuits built using filters, rectifiers, and then voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level, and finally, regulating to obtain a desired fixed dc voltage.120v AC supply is converted into 5V DC supply.

Circuit diagram of power supply

Block diagram of RFID

Principle of operation of an RFID

ADVANTAGES

- Reduces manpower required in billing section. This can reduce the expenses incurred by the management.
- Users can be aware of the total bill amount during the time of purchase.
- Reduces time spent at billing counter and Increases customer satisfaction.

APPLICATIONS

- shopping mall
- toll gate
- textile store

4. CONCLUSION

The progress in science & technology is a non-stop process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place. This project is used in shopping complex for purchase the products. In this project RFID card is used as security access for product. If the product is put in to the trolley means it will shows the amount and also the total amount. But in this project RFID card is used for accessing the products. So this project improves the security performance and also the speed.

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