Fingerprint Based Automatic Ration Distribution System

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Abstract – *The resources in the world are finite and though the desire for resources is infinite. One of the largest retail systems in the world is India's public distribution system. The manual work involved and lack of automation, makes this system inefficient. The conventional ration card system is replaced by automatic rationing system. This system uses authenticated finger print detector to provide products to the users. When the input is provided, the products are obtained from automatized ration shop. This system provides products with accurate weight and unnecessary selling of goods can be avoided. The ration shop is connected to government via GSM to prevent irregularities in ration distribution.*

Key Words: **Authentication, Finger print detection, GSM, Public distribution system, Ration card**.

1.INTRODUCTION

One of the largest retail systems in the world's is India's public distribution system with four lakhs fair price shops. These shops provide sugar, rice, wheat, kerosene etc to the customers at affordable rates. This network of shops is spread all over the country which is controlled and monitored by central government along with state government Quantities of these products are fixed for each family depending on their monthly income. There are many families who do not claim their quota of food grains every month. The shop dealers may have fake ration cards which inhibits the customers from getting the exact amount of ration they need. The dealer may sell the goods at higher rates to outer markets there by earning a good profit. This makes the current public distribution system corrupted and inefficient. The current scenario has led to anarchy and black marketing. The government is not getting any acknowledgement regarding the supply of food grains with the current system. Involvement of manual work creates irregularities there by replacing the actual products by meagre quality products and supplying them. The automatic ration distribution system uses finger print technology to automatize the public distribution system thereby minimizing the corruptions. In this system, the manual work is replaced by automated system. The smart card replaces the ration card by including all user information. This system is much more secured and easy to use. This method can eradicate corruption in public distribution system to a great extent.

2. PROPOSED SYSTEM

The proposed system runs on the basis of automation. The heart of the system is the microcontroller PIC16F877A. the biometric or finger print identification is the first step of the system. The finger print of each user will be stored in a database. After identifying the finger print, the name of the person and ration will be displayed via LCD display. The user can now enter the amount of ration he wants through a five keypad. The valves of the system open to provide the commodities. The details of the purchase will be sent over a GSM to the user's mobile and authorities. The proposed system implements a centralized web enabled ration distribution and corruption controlling system. The goods are stored in a storage tank and when goods are inserted in ration shop, the quantity log is updated. The quantity log can be accessed by the user whenever he needs to collect ration from the ration shop. This method prevents increased corruption in private as well as public sector. The adulteration in consumables can be prevented to a great extent with this system. This system is very cost effective and time saving approach.

2.1 Automatic rationing System Technology

The method of finding match between two human finger prints refers to finger print identification. It involves enrollment, searching and verification. Enrollment captures finger print from the sensor. The most commonly used algorithm for finger print recognition is minutiae based algorithm. Minutiae and patterns are very important in the analysis of fingerprints since no two fingers have been shown to be identical. A keypad is a set of buttons which bears numbers, alphabets or digits. The system uses five key pad.

Fig -1: Five keypad

The buttons and corresponding functions of five key pad are as shown:

Table -1: Buttons and functions

NO.	BUTTON	FUNCTION
1	SET	To set an initial condition.
2	MOV	Move to next position.
3	INC	Increment.
4	DEC	Decrement.
5	ENT	Save/Select.

The microcontroller, which controls the overall operations forms the heart of the system. The power supply provides power to the functioning of entire system. The finger print detector checks the correct user access and key pad is used to enter the required input to the system. The collecting object at the output side is sensed by an IR sensor. The LCD unit displays the output corresponding to the input provided. Relays and motors control the opening and closing of valves to collect the products. The switching operation between the fingerprint module and GSM module is also controlled by a valve. The GSM module sends up-to-date information to the user as well as the authorities.

2.2 Working

The power supply unit of the system consists of a step down transformer, rectifier, filter and a regulator. The step down transformer steps down the main voltage into required level. The output of the transformer which is AC is converted into its DC value by a bridge rectifier. In the converted DC voltage there will be some amount of AC particles called ripples, which will be removed by a filter. The regulator uses zener diode as its main component and provides a regulated constant output voltage. This regulated voltage is used by the rationing system for its operation. The microcontroller is connected with crystal, reset connection and supply. The input is entered using five key pad. The five keys in the key pad are SET, MOV, INC, DEC and ENT. The SET key sets initial condition or clears the data. The cursor is moved to next position using MOV key. The values are increased and decreased using INC and DEC keys respectively. The current status is saved using ENT key. The finger print module and GSM modem are connected serially. The transmitter pin of finger print module is connected to receiver pin of microcontroller. Receiver pin of finger print module and GSM are connected to transmitter pin of microcontroller. The switching between finger print and GSM modules is done with relay.
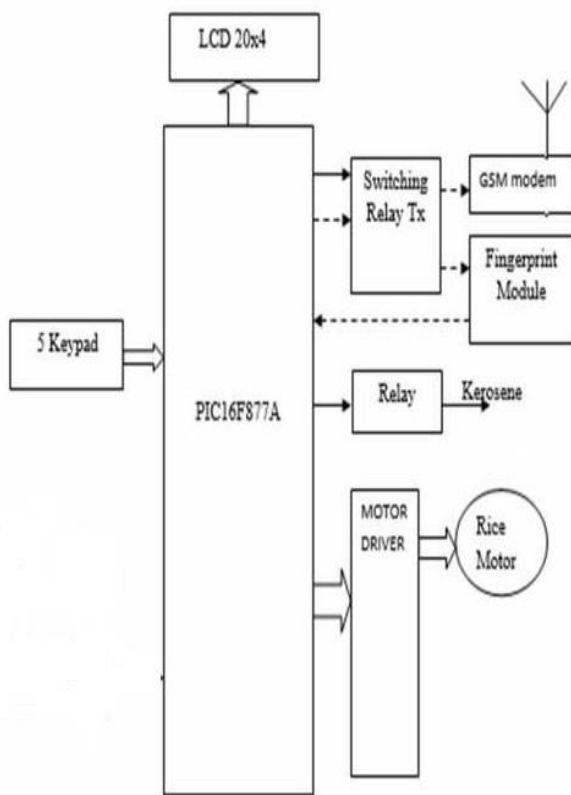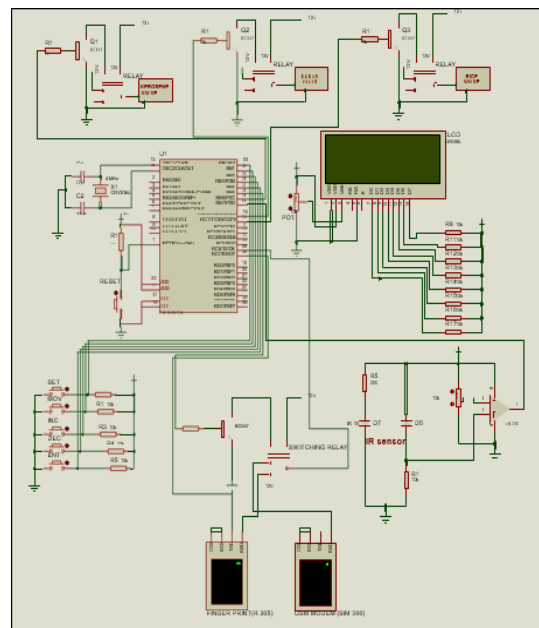

Fig -3: Circuit Diagram

The finger print of users will be scanned and stored in a database. If a user places his finger in the finger print module, it checks the matching with the ones stored in database. If the finger print matches the information about the user will be displayed in LCD. Using five key pad the amount of products required is fed on to the system. Once the input is fed the valves open to provide the corresponding products. Two separate valves are provided, one for solid and other for liquid.
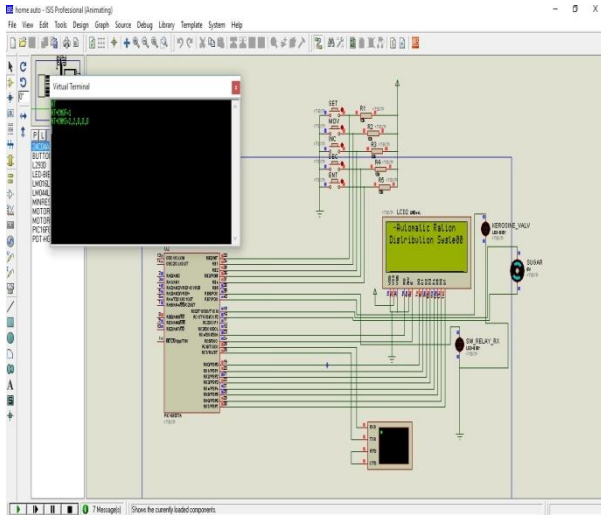

Fig -2: Block Diagram

Fig -4: Simulated Result

Fig -5: Hardware Setup

Fig -6: Valve opened providing rice

3. CONCLUSIONS

The automatic ration distribution system depicts a platform where the irregularities in public distribution system can be eradicated to a greater extent. This system eliminates man power thereby increasing efficiency and accuracy of the consumables.

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