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DIGITAL GRAIN AUTOMATIC TELLER MACHINE

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Abstract : Every Indian Family issued ration card based on which given subsidized food grains are distributed. For distribution and storing of food grains, an effective smart approach is proposed in this paper. Due to manual distribution sometimes the user does not get actually measured food grains as it gets replaced with a poor quality of food grains. The main purpose of designing the system is to provide security for grains which are received from the government by the interfacing officer locking system. The proposed design provides ease of use to the customers. The presented system is offline as a database of user and officer is stored in memory according to the particular areas. The authentication is provided for the officer who loads the grains in a container and for the customer to receive the grains. Interchanging of food grains is prohibited after proper verification of identification number.

I. INTRODUCTION

The main objective of this pilot project is to make sure that the right quantity of grain is sent to the right person without any hassle. The project is majorly related to the ration shops.The atm is linked to system and is fitted with a keypad, where the beneficiaries of the scheme can enter their number or card number to avail the benefits. As of now, the machine can only dispense 1 types of grains wheat.There is a plan to install these food supply machines at government depots across the state.the statement said that the grain atm is an automatic machine which works like a bank atm and is called automated, multi commodity, grain dispensing machine," it said. On PIN authentication, the food grains prescribed by the government to the beneficiaries will be automatically filled in the bags installed under the machine. One type of grains – wheat can be distributed through this machine. At present, distribution of wheat has been started from the grain atm machine installed in farrukhnagar (gurugram)..Facilities have shown tremendous growth within the last few decades but that is available only in metropolitan cities and towns not in rural areas like villages. In the field of grain dispensing, many of the vending machines are used in different forms. Up till now many of them have been developed for the convenience of the public like those which can provide grain just like the ATMs but none of them is efficient and portable at all areas as well as on the stations. There are many vending machines which provide grain but they use a huge amount of power for proper functioning. Some of them use solar power but only dispenses glucose water from it. Approximately four hundred deaths take place every day in India due to lack of grain in highways and many other places. The solar-powered vending machine is a proposed system which uses solar panels for power supply which is a renewable resource. This system is basically for the people at all over places, where we can't get at their nearby places which makes it more efficient. This system has a pin type password to unlock the product for the user which saves the battery consumption of the machine and increases the security system.

II. NECESSITY

In past couple of years, many machines have been made which provides different types of products within different number selections. They can be divided into food vending machines, chocolate vending machines, snack vending machine, glucose water dispensing and many other forms of liquid dispensing vending machines. In concern with the Ration shops , up till this 21st century, we are not able to provide grain at all over places many more areas which are still under up-gradation. This product is used to dispense first-aid items as well as all the necessary, for the persons who need. The central point of the concept is to deliver alteration usage in the eyes of the people at places where there is no shops nearby.

III. OBJECTIVES

Some don't use vending machines due to the hygiene problem. The major objective of this device is to resolve all these problems and provide a userfriendly vending machine which is portable and effective at all over places. This device can also be used inside an organization for its employees at work. This device is used at all over places and used by the public has a particular PIN password issued by their organizations.

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IV. SCOPE

This product can be used at various places just by increasing the security of the system according to the places it has to be placed. Many organizations can also use this by providing advertisements for their company. The charge controller is used in solar panels for regulating current and charging of batteries, where the charging needs a new circuitry to boost the charging time while increasing the life span of the battery. Many more products can be placed within the machine for better results in future.

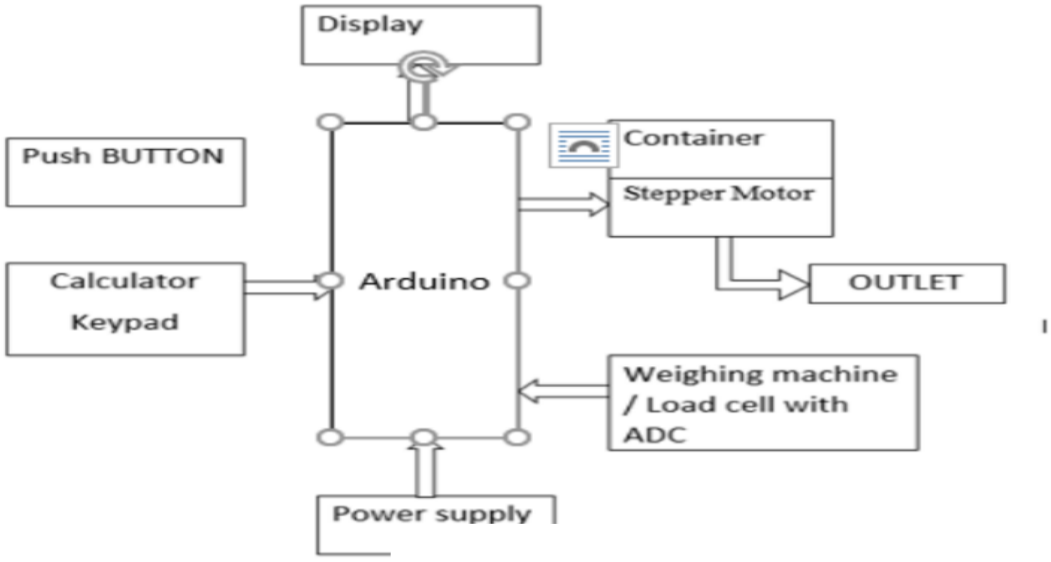
V. THEORETICAL BACKGROUND

To provide a solution to avoid such theft and malpractices, this paper discusses about Automatic Multi-Purpose Ration Dispensing Machine based on Technology.

Microcontroller is a controlling device for monitoring the project. This Microcontroller collects the data, reads and sends the data through the. The Microcontroller is programmed used embedded "C" language using Arduino 2560. The Mega 2560 is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins - 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button [3] The Arduino Mega 2560 board is firstly interfaced with LCD to display the cardholder information like their name, monthly withdrawal information, etc. The Solenoid valve and Servo motor is interfaced with Arduino board, the Solenoid valve is controlled by the relay circuit and it is used to distribute the liquid like Kerosene oil.

VI. SYSTEM DEVELOPMENT & RESULTS

Introduction



- Power supply
  Power supply to this vending machine is been provided by the solar panels used for power generation and then it is been stored in batteries for later use. This vending machine also uses charge controller for the safety precaution for the whole system as well as the battery.

- LCD screen
  This screen is used in the vending machine to provide message as an output to the user. This also gives command to the system to automatically move to power saver mode or come back from the power saver mode.

- Software used
  Software like ISIS proteus was used for testing the interfacing of different components with Arduino used within the system, basically for Arduino board simulations. A software Ardunio IDE, for writing and uploading the program to the compatible Arduino boards were used.

- Storage system
  This device has large storage capacity for storing extra medicines and kits for later use. This also stores hand sanitizer as well as additional infrared thermometer if in case the used one gets destroyed due to any reasons

VII. HARDWARE IMPLEMENTATION

1.Display (LCD screen)

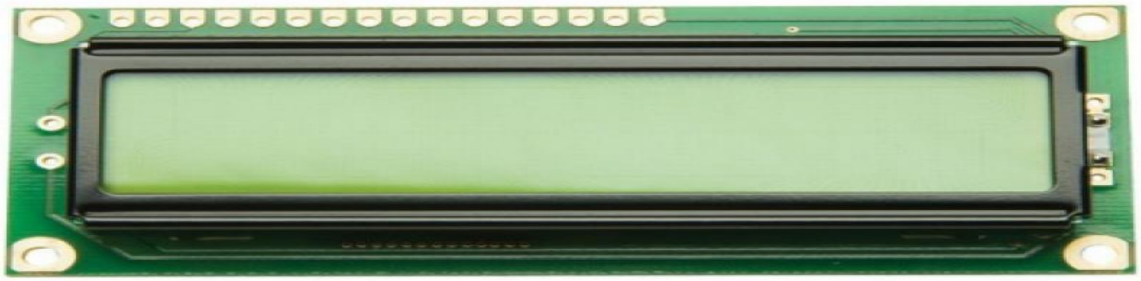


Fig 3.2 LCD Display

This screen is used in the vending machine to provide message as an output to the user. This also gives command to the system to automatically move to power saver mode or come back from the power saver mode.
This is a basic 16 character by 2-linealphanumeric display. Black text on green background. Utilizes the extremely common HD44780 parallel interface chipset. Interface code is freely available. You will need Minimum 6 general I/O pins to interface to this LCD screen. Includes LED backlight.

- 16 Characters x 2 Lines
- Green Backlight
- 5x7 Dot Matrix Character + Cursor
- HD44780 Equivalent LCD Controller/driver Built-In
- 4-bit or 8-bit MPU Interface
- Standard Type
- Works with almost any Microcontroller.

2. Arduino

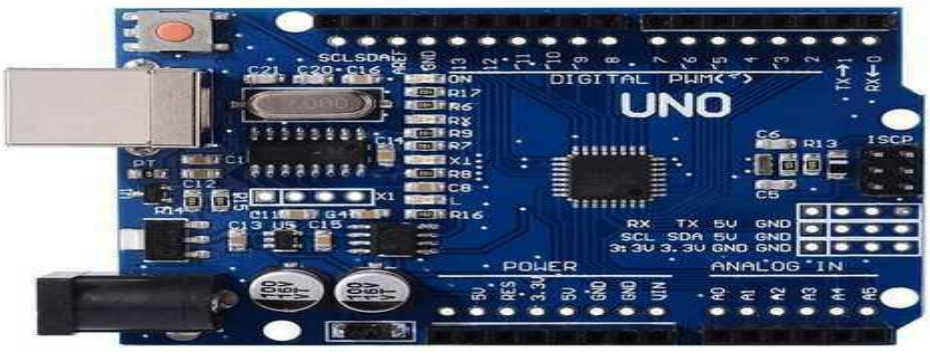


Fig 3.3 Arduino

Considering the above requirements, Arduino Uno controller is selected for execution of project work. Following key features of Arduino Uno are used

- Microcontroller: ATmega 328
- Operating Voltage; 5V, as all the sensors used are operating at 5V level, they can be directly interfaced with Arduino
- Supply voltage: 7 – 20V
- 14 digital I/O pins
- 6 Analog input pins

3.Keypad

Fig 3.4 Keypad

The keypad is works to give a input to the arduino and it given in the way of the card number and for password.The working principle is very simple. Pressing a button shorts one of the row lines to one of the column lines, allowing current to flow between them. For example, when key '4' is pressed, column 1 and row 2 are shorted.

- Easy communication with any microcontroller
- 5 pins 2.54mm pitch connector, 4×3 type 12 keys.
- Sticker can peel off for adhesive mounting.

4.DC Servo Motor

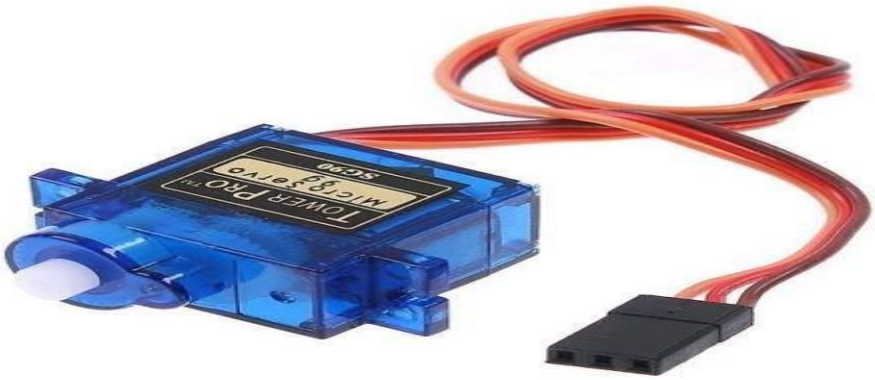


Fig 3.5 DC Servo Motor

An ordinary DC motor has two hookup wires and simply turns continuously when power is applied. If you want it to spin in the opposite direction, you'll need to reverse the power. And if you want to know how far it has turned, you'll need to devise a way to measure that. Most hobby servos use a standard type of 3-pin plug, with the same control signaling, which makes RC servos reasonably interchangeable.

Pin Number	Signal Name	Color Scheme 1 (Futaba)	Color Scheme 2 (JR)	Color Scheme 3 (Hitec)
1	Ground	Black	Brown	Black
2	Power Supply	Red	Red	Red or Brown
3	Control Signal	White	Orange	Yellow or White

Table 3.1 Motor Connection Colo' S

VIII. COMPARISON WITH MANUAL METHOD

Manually operating	Machinery operated
People can cheated	People can't be cheated
People can't get ration at their convenient timing	People can get ration at their convenient timing
Duplicate and bogus ration cards can be used	Elimination of Duplicate and bogus ration cards can be used
Data is not maintain properly	Data is maintain properly
It is not bring transparent	It bring transparent
It is not required any power supply	It is required power supply
System is not accurate	System is accurate
Processing speed is slow	Processing speed is high
Material can be theft	Material can't be theft
Poor quality of supplies	Good quality of supplies
Over crowd	Not over crowd

Table 3.2 Comparison with Manual Method

IX. DESCRIPTION OF HARDWARE MODEL

CIRCUIT DIAGRAM

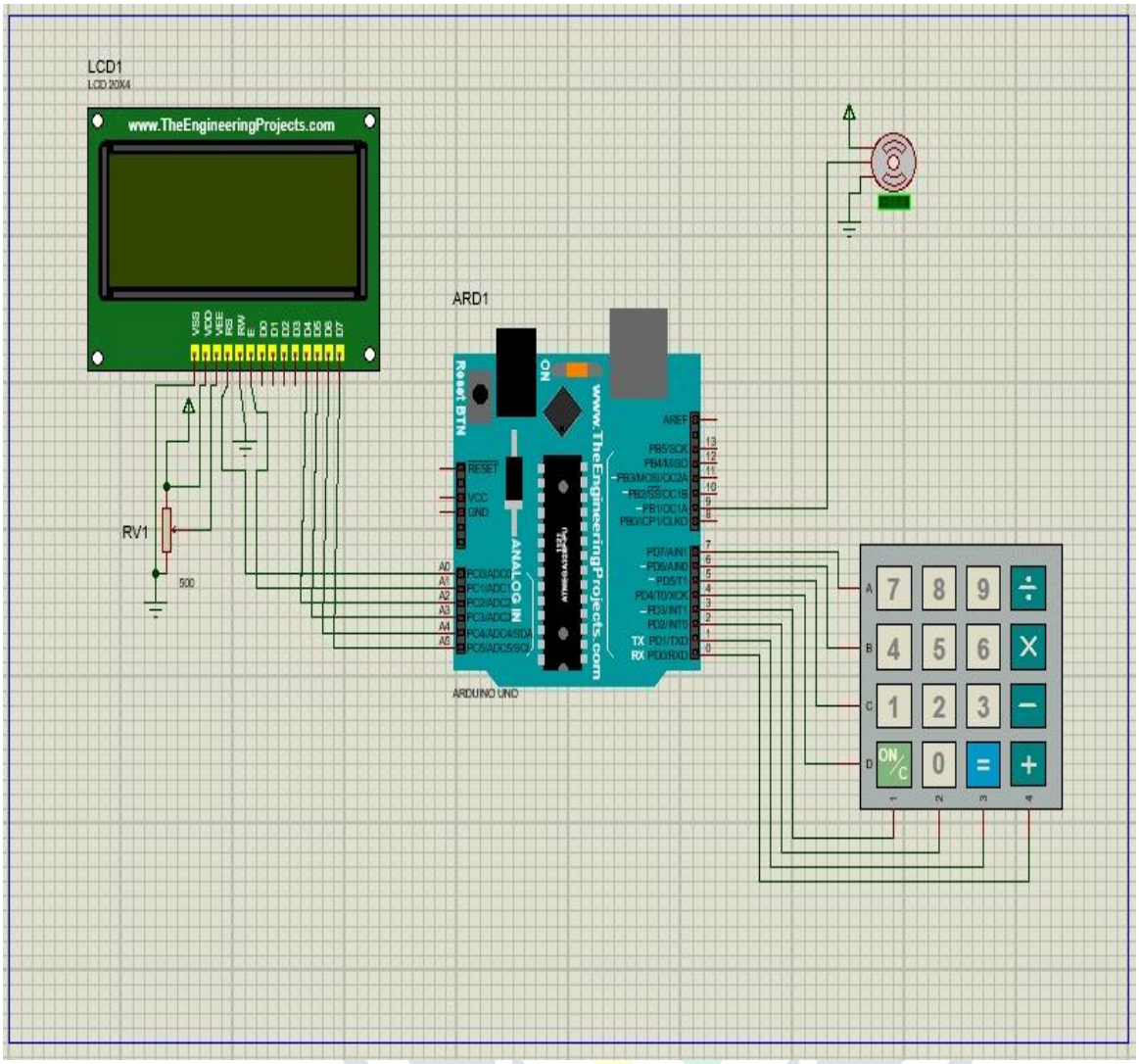
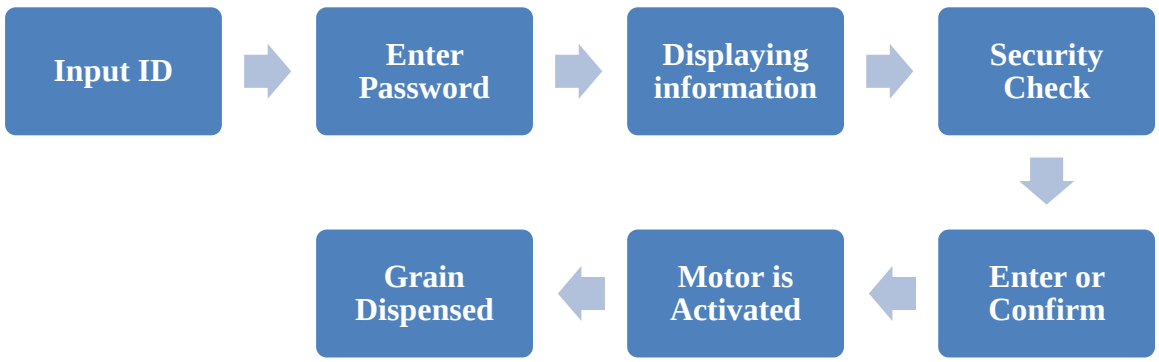


Fig .1: Circuit diagram

X. 3.4FLOW OF HARDWARE MODEL (STEP WISE PROCEDURE OF WORKING)



XI. WORKING

This device is been functioned by the user who is in need of first-aid kits or basic health medicines. This device consists of first-aid kits, sanitary napkins, cough and fever tablets, bandage and pain killer cream for any hairline/muscle fracture, pain killer tablets and one-time usable masks. This device also consists of hand sanitizer and the digital infrared thermometer at the outlet of the vending machine.

At the start, the user swipes the magnetic card which is later read by the card reader. Once the card reader reads the card, a message on the LCD screen is been displayed welcoming the user. Then the user is requested to sanitize their hand in the sanitizer section. After this process, the user checks its body temperature. After commencing all these processes, the inner section of the vending machine gets moved out of the power saver mode into the functional mode. Now the user is able to select the product which they need according to the emergency situations in which they are. The user selects the required product number using the keypad and then the product is been dispensed out at the dispensing section using motor driver modules to rotate the aluminium wire to dispense the product. After this process, after some delay, when no card reader is been read or no process takes place within the vending machine, then the machine automatically moves into the power saver mode.

XII. PERFORMANCE ANALYSIS

At the start, the user swipes the magnetic card which is later read by the card reader. Once the card reader reads the card, a message on the LCD screen is been displayed welcoming the user. Then the user is requested to sanitize their hand in the sanitizer section. After this process, the user checks its body temperature. After commencing all these processes, the inner section of the vending machine gets moved out of the power saver mode into the functional mode. Now the user is able to select the product which they need according to the emergency situations in which they are. The user selects the required product number using the keypad and then the product is been dispensed out at the dispensing section using motor driver modules to rotate the aluminium wire to dispense the product. After this process, after some delay, when no card reader is been read or no process takes place within the vending machine, then the machine automatically moves into the power saver mode.

The system has performance based on the various results displayed on the LCD.

1. System to be begin:
   In this the system is being initialized and name of the project is displayed on the LCD.

2. Displaying the name of the system:
   As there are two systems one is user locking system and other one is officer locking system. We have consider one system to display the appropriate message on the LCD i.e. Officer Locking System.

3. Entering the password:
   In this system password is entered by the user whose database is already stored in the SD card.

4. Excepting the password:
   When the password matches the password stored in database a particular message is displayed on the user screen.

5. Opening the container for loading grains:
   When password is accepted by the system the container is open to load food grains.

6. Quantity Loaded:
   When servo motor is displayed by 180 degrees phase shift, a message is displayed on LCD to load grains

XIII. APPLICATION

1. It is concerned on automation of process involved in ration shops which are the part of public distribution sectors (PDS) and digitalized it
2. It can be implemented in all the ration shops to help people not be cheated
3. This new technology gives solution and this research work will make a great change in PDS and
4. Provides benefit to the government by sending current stock information 5) Milk dispensing system
5. Water distribution system
6. Fertilizer and micro-organism dispensing system in agricultural
7. Water distribution system: In water dispensing system the water is obtained by inserting the card or the coin when the card/coin is inserted the data with respect to particular person is available based on the quantity available the water is withdrawn

XIV. HARDWARE RESULTS

The results of the project operations are mentioned in table 5.1 and table 5.2. Table5.1 shows the reading of weight of grain dispensed with respect to the time.

Weight(grm)	Time taken in sec.
100	1
200	2
300	3
400	4
500	5

Table 5.1: Observation Manualy

Weight (grm)	Time taken in sec.
100	1.5
200	2.3
300	3.5
400	4.4
500	5.5

Table 5.2: Observation with set time in program

XV. CONCLUSION

Public distribution system is an automation system and it is a recompense over the present fair price shops. It eliminates fake ration card holders and protects the interest of the common people ensuring the country's food security. By means of its performance, corruption level will come down. Selecting the commodity and quantity will make the system more smart and robust. It will help the country's economy to reach new heights. The automated PDS is easy to implement and requires much less hard work when compared to the other system. Using this system one can avoid the malpractices because there are no manual operations and also all information are stored in the database. So this system will be really helpful to the people. As there is no manual data stored in books or register, all the data is stored in database hence it is easy for higher authority to cross check the data at any point. So implementing this will be really helpful to targeted people.

XVI. ACKNOWLEDGEMENT

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