

AUTOMATIC SANITARY NAPKIN VENDING MACHINE USING ARDUINO

Prof. Mr. Mane V. A.¹, Desai Mariya Shakil², Admuthe Prachi Shrikant³, Sisal Utkarsha Balaso⁴

¹ Assistant Professor E&TC Engineering, Annasaheb Dange College of Engineering and Technology, India

² Final Year B. Tech, E&TC Engineering, Annasaheb Dange College of Engineering and Technology, India

³ Final Year B. Tech, E&TC Engineering, Annasaheb Dange College of Engineering and Technology, India

⁴ Final Year B. Tech, E&TC Engineering, Annasaheb Dange College of Engineering and Technology, India

Abstract - In today's world women cleanliness or hygiene is of very important and to be taken care by them. Women in India are still shy of buying napkins from outside like shops, medicals and from other store. A permanent solution to this particular problem by installing a napkin dispensing system in different places like schools, colleges and public places. It is a kind of Automatic sanitary napkin storage system which can be easily accessed by the people in emergency without approaching any store. It is a microcontroller and motor-based system to dispense the napkin when accessed by the consumer after specified amount inserted into machine. This Automatic Sanitary Napkin Vending Machine mainly constitutes of a really simple mechanism of 'drop and collect'.

Keywords: Dispensing, Microcontroller, Napkin, Vending.

1. INTRODUCTION

Most of the teenage girls drop out from the schools because of proper facilities which are not provided to them when they are menstruating. In every woman's life menstrual protection in today's situation is a very serious problem to them. About 90 percent in India women make use of feminine cleanliness that have been practiced for generations such as napkins fashioned out of natural fiber covering or husk that can be strips of cloth. For poor consumers disposable sanitary napkins are so expensive due to lack of awareness that limits to women's comprehension of sanitary napkins should be used and how they promote hygiene and health. In colleges and schools girls don't have access to functional toilets, disposable facilities and proper sanitation. During the first 3 days of menstruation cycle they need to change their sanitary napkins every three to four hours or else they will be getting affected by uterus Cancer and Toxic Shock Syndrome. Toxic Shock Syndrome can affect anyone who will be using the swabbing for a longer duration.

Women taking care of themselves by day to day activities and taking care of women during menstruation are also very important. A small negligence in menstrual hygiene management which will be affecting a women's body which may cause grievous harm and may also act as an instrument for spreading of infection to other people. Now in today's lifestyle, several menstrual hygiene products like sanitary napkins and tampons are available in markets. Indian women of 86% don't use the basic form of protection during menstrual. Instead many

of them use leaves, mud, old rags etc. Talking regarding menstruation is a taboo in our societies and this contributes to the ignorance and illiteracy during menstrual management. The result is that they have to miss out work, schools as well as their daily other commitments. So there is a need to make availability of sanitary napkins to them, which can be achieved by means of vending machines.

By installing vending machines in the working area and in the educational institutions help them to get the napkins when it is required. By installing an automatic napkin dispenser in public places keep track of available napkins and inform the person concerned. There is a social taboo and stigma which is associated with sanitary napkins, normally more number of girls in rural side feel hesitant or feel embarrassed in procuring it from medical shops because most of them managed by males. This results in women pursuing unsafe practices during menstrual periods by using unhygienic methods.

PROBLEM STATEMENT

A small look out towards the major social problem regarding women's menstrual cycle this look out may help the female society to lead a healthy wealthy life. And this small contribution of developing vending machine will surely make availability of sanitary napkins to women's and avoid them using any other materials which causes harm to their lives.

OBJECTIVE

- To design and fabricate a transportable vending machine using simple techniques.
- We want to provide the vending machine a good and convenient mode for anytime access to the sanitary napkins.
- To adopt a simple design mechanism, this can be easily maintained.
- To supply portable sanitary napkins at economical cost.
- The main aim of this project is to provide country safe and hygienic sanitary practices among the ladies.

2. METHODOLOGY

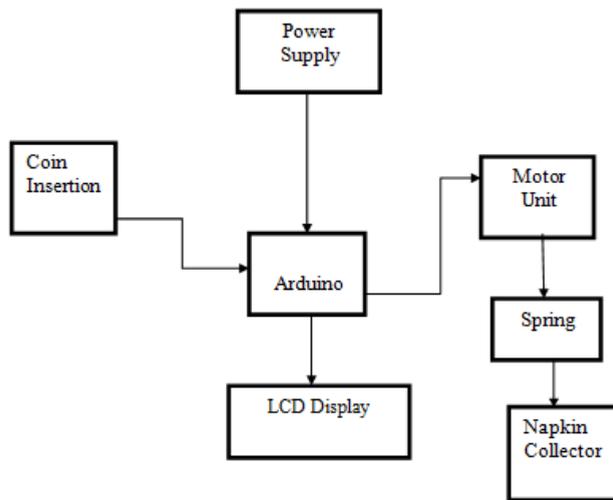


Fig -1: Block diagram of system

3. OPERATION

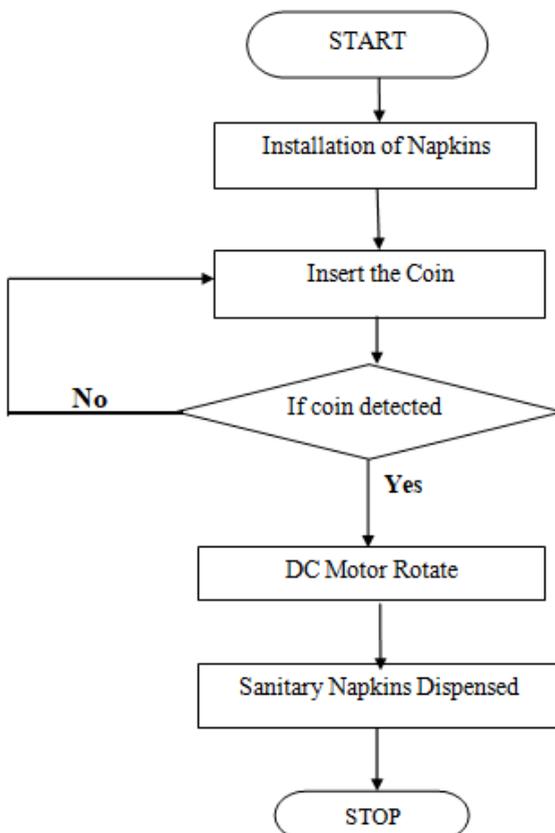


Fig.2 Flowchart

4. WORKING

The user can drop a coin through the slot provided. After the insertion and sensing of the coin, execution of the method starts. As the user drops the coin, checks whether the coin is valid or not. If it is valid coin acceptor accept coin, if not the coin is returned to the user. A sensed coin waits for the complete process to be completed before getting deposited into the gathering box. The rotation mechanism of the DC motor working motor and also the associated with springs ensures that proper operation takes place and also the napkins vended properly. Coil spring is a dispensing mechanism for vending machine which connected to the AT mega 328 microcontroller through dc motor and motor driver to achieved required rotation for napkin outlet .Coil spring comprises closely spaced neighboring loops, which capable of supporting and transporting the product to be vended. As the coil is turned napkin is transported towards dead end until it reaches the distantly spaced loops where it drops from the dead end to the dispense slot which can accessible by user.

5. HARDWARE REQUIRED

- Arduino
- Coin Acceptor
- DC motor
- Display
- Spring
- Motor Drive IC

Arduino

Arduino is an open-source electronics platform based on Easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing. Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments.



Fig. 3 Arduino Uno Board

LCD Display

Liquid Crystal Display screen as shown in Figure, acts as an output source for displaying the information. It acts as an interface between the user and the microcontroller.

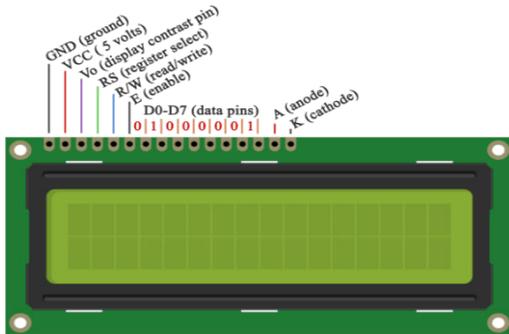


Fig. 4 LCD Display

DC Motor

The DC motor is the device which converts the direct Current into the mechanical work. It works on the principle of Lorentz Law, which states that “the current-carrying conductor placed in a magnetic and electric field experience a force”. The experienced force is called the Lorentz force. The Fleming left-hand rule gives the direction of the force.



Fig.5 DC Motor

Coin Acceptor

A coin acceptor validates a coin/token based on physical properties such as weight, size and/or magnetic content and then sends a corresponding I/O signal to its output connector. As the user drops the coin, checks whether the coin is valid or not. If it is valid coin acceptor accept coin, if not the coin is returned to the user.



Fig.6 Coin Acceptor

5.5 Spring

Coin spring is a dispensing mechanism for vending machine which connected to the ATmega328 microcontroller through DC motor and motor driver to achieve a required rotation for Outlet.

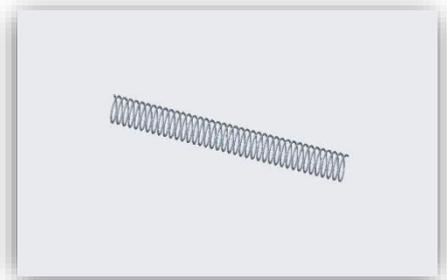


Fig.7 spring

5.6 Motor Drive IC

This motor driver or motor driver IC is allowed dc motor to rotate on either direction. It is a 16 pin IC which can control a set of two DC motor simultaneously. It works on H- Bridge concept where driver alter the voltage and control the direction of motor which is either clockwise or anticlockwise. In this work we used this driver. Because, we need to control our dc motor rotation to dispense the sanitary napkin.

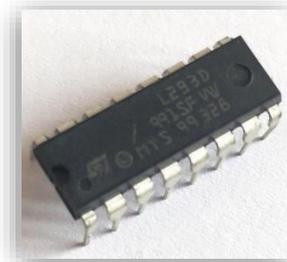


Fig. 8 Motor Driver IC

Implementation Setup

The setup module shown in figure 9.



Fig. 9 Implementation setup

6. ADVANTAGES

- It is easy to install.
- It acquires less space.
- The sanitary napkins are at reasonable cost.
- It can be located in schools, shopping malls, offices etc.
- The napkins are hygiene.
- At a time 30 napkins can be install.
- The battery can be rechargeable.

7. FUTURE SCOPE

The system can be designed with multiple coin detection and utilized as an extra option for customers in a rural area. Also integrated with napkin disposer to achieve dispensing and disposing in a single unit. Sanitary napkin vending machine should be installed in every need and all accessible places. In future this project can be implemented by adding extra features, instead of coin RFID card can be used as the input. By reading the card system can vend the napkin. And also this project can be implemented by adding extra features like digital payment system in our automatic sanitary napkin vending machine. The capacity of the machine can be increased by adding springs and motors.

8. CONCLUSIONS

Woman hygiene is our utmost important factor to be considered, this vending machine reduces customer retailer cycle as many girls feel shy of purchasing sanitary napkin on medical store. The Implemented system concludes that Installation of the sanitary napkin vending machine provides the easy accessibility of napkins during the time of emergencies. By easy access of napkins the hazardous diseases like toxic shock syndrome (TSS) and uterus cancer can be prevented. This real time work represents a solution for easy accessibility for the napkins.

9. REFERENCES

1. Paper
 - RFID and GSM based Automatic Dispensing and Monitoring of Sanitary Napkin Vending Machine for Menstrual Hygiene among Women
 - Manufacturing of Cost Efficient Sanitary Napkins Incinerator Machine
 - Menstrual Hygiene, Management, and Waste Disposal: Practices and Challenges Faced by Girls/Women of Developing Countries
2. Books
 - Programming Arduino second edition
 - Inchy the Bookworm