

SANITARY NAPKIN VENDING MACHINE USING QR CODE

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Abstract: Now-a-days due to increase in various diseases more attention is given to cleanliness and hygiene in order to be safe. As menstruation is the part of the women's life it is important to take measures for the hygiene during these days. Due to poor hygiene many health problem arises. Usage of cloth during menstruation is also unhygienic. In India women are still shy of purchasing sanitary napkins from medical stores. We can overcome this problem by installing the vending machines in public places, offices, toilets, schools and colleges. The existing vending machine operates on coin which provides a napkin whenever a coin is inserted. But it has a drawback sometimes the vending machine is unable to recognize which coin due to which the napkin is easily provided when a duplicate coin is inserted. Instead of using coin we are coming up with the idea of using QR code. Whenever the QR code is scanned the napkin is dispensed and the owner gets the SMS on the registered mobile number whenever the napkin is dispensed and it also gets the count of the napkins remaining in the vending machine. The owner gets the alert message when the count of the napkins is less than five to fill up the respective vending machine with the sanitary napkins.

Keywords— *Sanitary napkin dispenser, vending machine, QR code.*

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I INTRODUCTION

Many women and girls in India are unaware of the menstrual hygiene. The school going girls are not educated properly so due to the lack of menstrual knowledge. Due to this many problem arises. Some girls are forced to leave the school because of the inadequate facilities of the menstrual hygiene. Poor sanitation in school can lead to the health problems. For those girls who cannot afford the disposable napkins can cause major health issues. Because during the first 2-3 days of the menstruation cycle there is need to change the napkins after every 5-6 hours in order to have proper hygiene. By not doing so it can lead to the various diseases like uterus cancer, urinary tract infections (UTIs). To avoid this we need to provide proper facilities.

According to the survey conducted only 36% of the women in India use sanitary napkins, others use cloths, leaves, old rags and such other materials to manage their flow. Whereas due to the current coronavirus situation has worsened the matter. It is difficult to provide the menstrual hygiene products to the rural areas. Moreover periods are considered as taboo in India. To overcome this there is a need to make availability of sanitary napkin vending machines. IOT based sanitary napkin vending machine will provide the napkins just by scanning

the QR code on the machine. In this paper we come up with the vending machine that provides the napkins immediately to

the concerned person and give the total count of the napkins to the owner via SMS. Once the payment is done using the QR code it will show the payment is done or not on the LED and if it is successful then the napkin is provided via outlet.

The main objective of this paper is to:

1. Immediate access to napkins anytime of the day to meet menstrual emergencies.
2. To send a message to the concerned person when stock is low.

II LITERATURE SURVEY

The plan is to make the sanitary napkin vending machine using QR code which provides the napkins once the payment is done just by scanning the code. In the earlier works the basic idea of vending machines like water vending machine, pepsi vending machine they all work on the mechanism of coin or RFID card. The coin is inserted in the vending machine through the coin inserter and the product is supplied via the outlet of the machine.

There are various drawbacks of the previous system:

Coin operated vending machine has the major drawback that the coin inserted in the vending machine if it is duplicate it will still provide the napkins.

The user has no idea of whether napkins are available in the machine or not.

III. BLOCK DIAGRAM AND METHODOLOGY

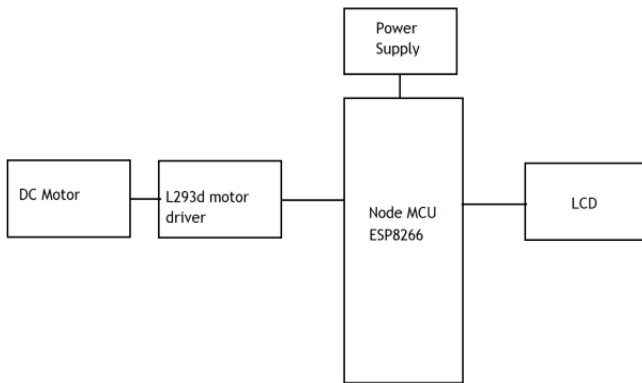


Fig-1: Block diagram of system

A. Methodology

An intelligent sanitary napkin vending machine is controlled by a microcontroller and is designed to work with QR code. The components used in this project are power supply, node MCU ESP2866, DC motor spring, LCD.

Power supply is used to supply power mainly to ESP8266. ESP8266 is used to send a message to the concerned authority, motor driver is used to drive the motor, motor is used to rotate the spring, spring is used to store the napkins. At last Microcontroller which controls all components of this project. As the user scans the QR code, checks whether the payment is one or not if it is successful microcontroller runs the program and if not then the LCD will show payment not successful. After successful payment user gets the sanitary pad via outlet. Then it checks for the availability of napkins, if napkins availability is less than 5, message is sent to the concerned authority through ESP8266 to refill the napkins.

The Microcontroller keeps track of the availability of napkins in the machine. When the user scans the QR code the QR Reader read it and sends a signal to Microcontroller. The Microcontroller sends signal to the motor driver L293d, which in turns ON the motor. As the motor rotates the spring mechanism starts to rotate for a pre-set amount of time, during which the napkin is dispensed. Once a napkin is dispensed, the count of napkins available is updated in the Microcontroller. As the count reaches a pre-set value, the Microcontroller initiates sending a SMS via a ESP8266 module.

B. COMPONENT SPECIFICATION

1.ESP8266

ESP8266 is a WIFI module which has integrated TCP/IP protocol which gives the access to the microcontroller to the WIFI network. It is pre-programmed with an AT command set firmware. It is mostly used for the development of IOT embedded applications.

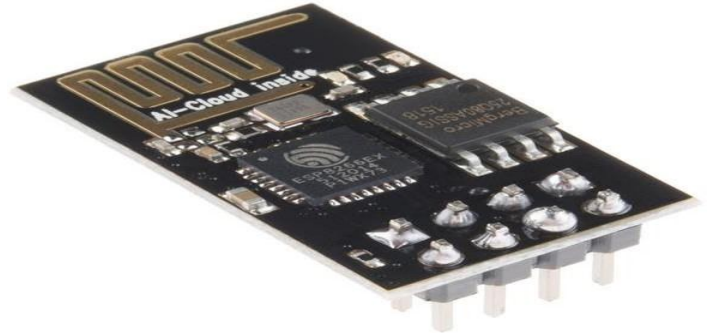


Fig-2: ESP8266 WIFI Module

2.4 GHz Wi-Fi I2C Protocol 10 bit ADC 16 GPIO

2.DC Motor Johnson

A Johnson geared DC motor is a simple DC motor with the gear box attached to the shaft of the motor which is mechanically commutated electric motor powered from direct current. It has a high torque.

2.LCD Display

It is an electronic display module and has a wide range of applications. It can display 16 characters per line and it has 2 such lines. The 16x2 LCD is capable of displaying 224 different characters and symbols. Here the LCD display is used to show whether the payment is done successfully or not.



Fig-: 16x2 LCD Display

3. Motor Driver L293D

Motor driver L293D is used to drive motor. It is a 16 pin motor driver IC. A single L293D IC is capable of running two DC motors at a time. It works on the principle of Half H-Bridge.

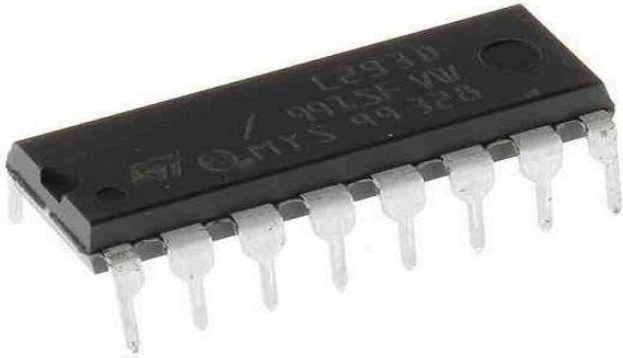


Fig.: L293D

1. Can run two DC motor at same time
2. Speed and direction control is possible
3. Max peak motor current: 1.2A

C. TEST AND RESULTS

As discussed till now we have successfully demonstrated the methodology to create the sanitary napkin vending machine. After the completion of the project we need to check the results. For that we took several trials that if the QRcode is scanning properly or not and whether the system is showing the availability of napkins or not and if yes then the message is send to the concerned person or not. If the availability of the napkins is less than five it will display the message as “Low Stock” and the message to refill the napkins is send to the concerned person.

This work can be installed in the schools, colleges, offices, public toilets and in the rural areas. Existing sanitary napkin vending machine works on the principle of the reference coin which can be easily duplicated. In this proposed system it will not be possible as we are using the QR code for the payment process. Moreover the existing system has the low capacity for storing the napkins so the availability of napkins is less and the accessibility is also less.

IV CONCLUSION

The proposed system concludes the installation of sanitary napkin vending machine at various places such as public toilets, schools, offices and rural areas to meet the menstrual need in the time of emergency. Moreover it will also help to avoid the embarrassing situations while purchasing the napkins from shops. The napkins are also of low cost as compared to the other napkins which will be really helpful for the needy. The implemented method has more capacity for the napkins than the existing system.

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