



Automated Sanitary Napkin Vending Machine

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1. Abstract :

This completely automated machine is powered exclusively by electricity. In this project model, software governs the mechanism. The quantity of sanitary napkins is incorporated with a physical inspection window. The project model can be mounted on the wall. The machine has the capacity to hold twenty napkins. Our slot machine combines cutting edge solid state electronic technology with inventive mechanical design. The sanitary napkin is packed using a single horizontal spring column, which is its main component. A high-load, low-torque DC motor powers the spiral, and it is controlled by a controller programmed to recognise PC impulses when data is supplied. Essentially, this is just a very simple "drop and collect" approach.

Key Words: Sanitary Pad, Sanitary Napkin, Vending Machine, Mechatronics.

2. INTRODUCTION :

An automated machine that accepts cash, coins, notes, or certain cards in return for products like food, beverages, tobacco products, toys, and tickets is called a coin-payment dispensary. The first modern vending machine delivered postcards and was created in England in the early 1880s. Vending machines can be found in many different countries and places. Compared to typical machine items, automatic vending machines are intended to offer fewer standard products. Technology is becoming more and more important in today's world, therefore learning how to create it as well as use it is essential. An engineer ought to be knowledgeable in the discipline that is opposite to their own. The majority of initiatives are restricted to a single discipline. This might limit one's innovation and creativity. This project inspires to create connections across several disciplines instead of learning topics in isolation because it combines mechanical, electronic, electrical and programming skills.

It's introduced for remote or rural areas.

- It builds towards the attention of the society.
- It brings out innovation and creativity.
- It enhances problem solving skills.

The machine helps to produce a sanitary pad on the payment.

According to a recent study, 88% of Indian women who are menstrual struggle with reproductive issues as a result of not having access to sanitary goods. Following their menstruation, over 23% of women leave schools and universities. These explanations highlight how critically important it is that we teach and assist the women of this era in meeting their basic requirements through our endeavour.

The following are the areas that this project will benefit: • Has a basic drop-and-pick system.

- Contains ten to twenty pads of storage.

- Mountable on the wall.
- Battery that can be charged.
- Economical.

3. NEED OF THE STUDY :

"Construct and design a cutting-edge sanitary napkin vending machine for use in public areas to solve the urgent problem of restricted access to sanitary items. The vending machine will provide affordability and accessibility for women in need by offering choices for both deferred payment and immediate payment using QR code, resulting in a smooth user experience. It is essential to educate people on the proper use of sanitary napkins, raise awareness of their use, and enable easy access to them via a machine.

1. The main objective of the sanitary vending machine is to offer sanitary napkins at a reasonable cost that are easily portable and don't require a lot of space. There should be napkins available wherever women travel and work. To establish free, secure napkins and improve national hygiene.
2. The placement of the sanitary napkin selling machines will provide a respectable and useful manner for anytime access. Accepting money with a QR code on the internet
3. To maintain a database and supply reasonably priced, travel-friendly sanitary napkins. Design and construct a transportable machine using simple materials.
4. This is simply maintainable because it uses a simple design technique. The one. The goal is to teach women safe and hygienic sanitary procedures.

4. RESEARCH METHODOLOGY :

HARDWARE COMPONENTS:

1. MICROCONTROLLER AT89S52



The AT89S52 is a CMOS 8-bit microcontroller that combines excellent performance and low power consumption. It has 8K bytes of internal programmable Flash memory. With the AT89S52, the following features come standard: Clock circuits, a full duplex serial port, 32 I/O lines, 8K Flash, 256 RAM bytes, three 16-bit timer/counters, a watchdog timer, two data pointers, a six-vector two-level interrupt architecture, and watchdog timers

2. SERIAL TO TTL CONVERTER MODULE CP21XX

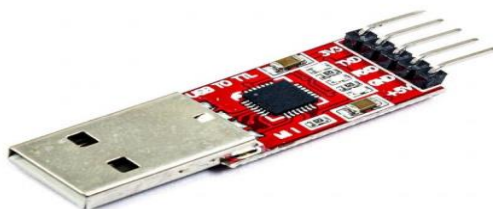
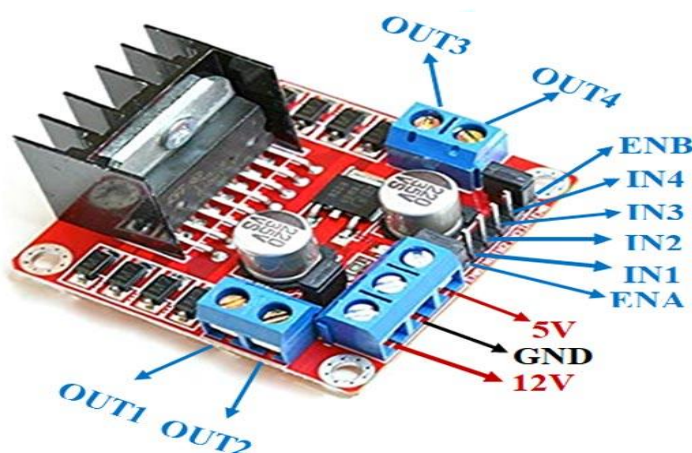


Photo by ElectroPeak

A compact and versatile USB to UART bridge module, the CP2102 Module facilitates communication between USB ports on computers and UART devices, such as microcontrollers, sensors, and other electronics. The CP2102 provides an easy-to-use interface for devices that use UART (Universal Asynchronous Receiver-Transmitter) communication

3. MOTOR DRIVER MODULE L298



This high power motor driver module, the L298N, can drive stepper and DC motors. This module is made up of a 78M05 5V regulator and an L298 motor driver integrated circuit. The L298N Module may control two DC motors with directional and speed control, or up to four DC motors.

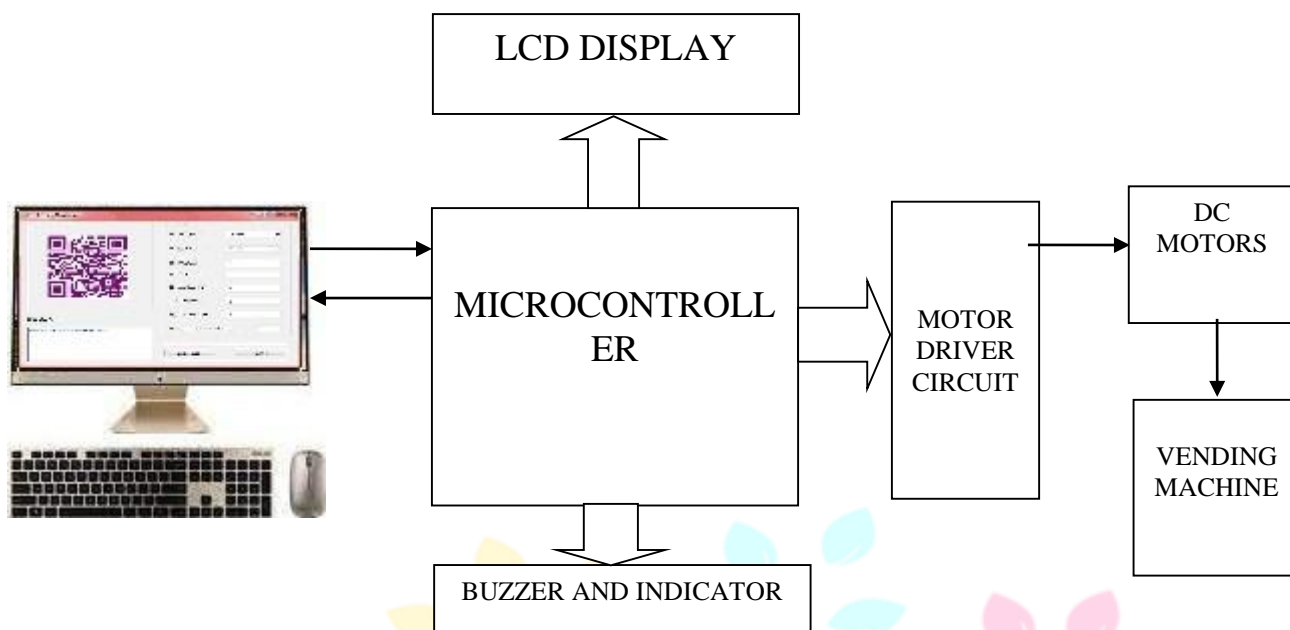
4. LCD 16X2



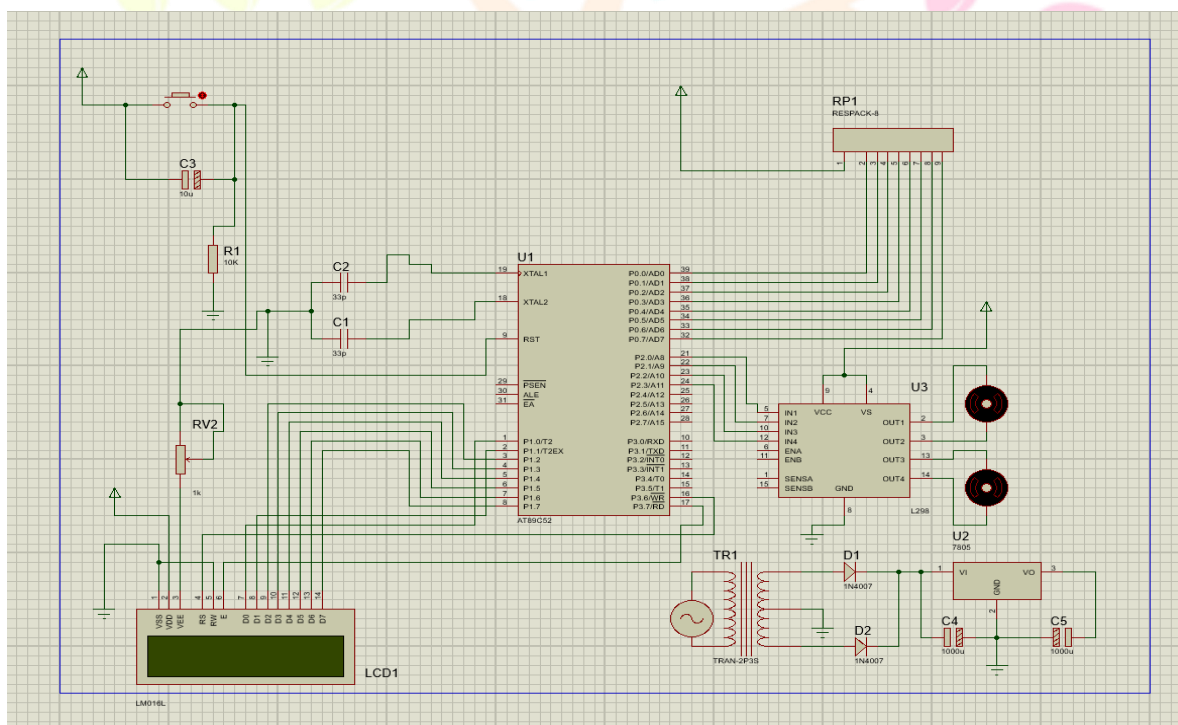
An LCD screen is a type of electronic display module that creates a visible image by using liquid crystal. One of the most fundamental modules used in DIY projects and circuits is the 16x2 LCD display. A display with 16 characters per line is translated into two lines using the 16x2. Every character on this LCD is shown as a 5 by 7 pixel matrix.

5. GEARED DC MOTOR 10 RPM
6. SMPS 12V - 2A
7. PC OR LAPTOP WITH MOUSE AND KEYPAD
8. BUZZER AND LED INDICATOR

BLOCK DIAGRAM :



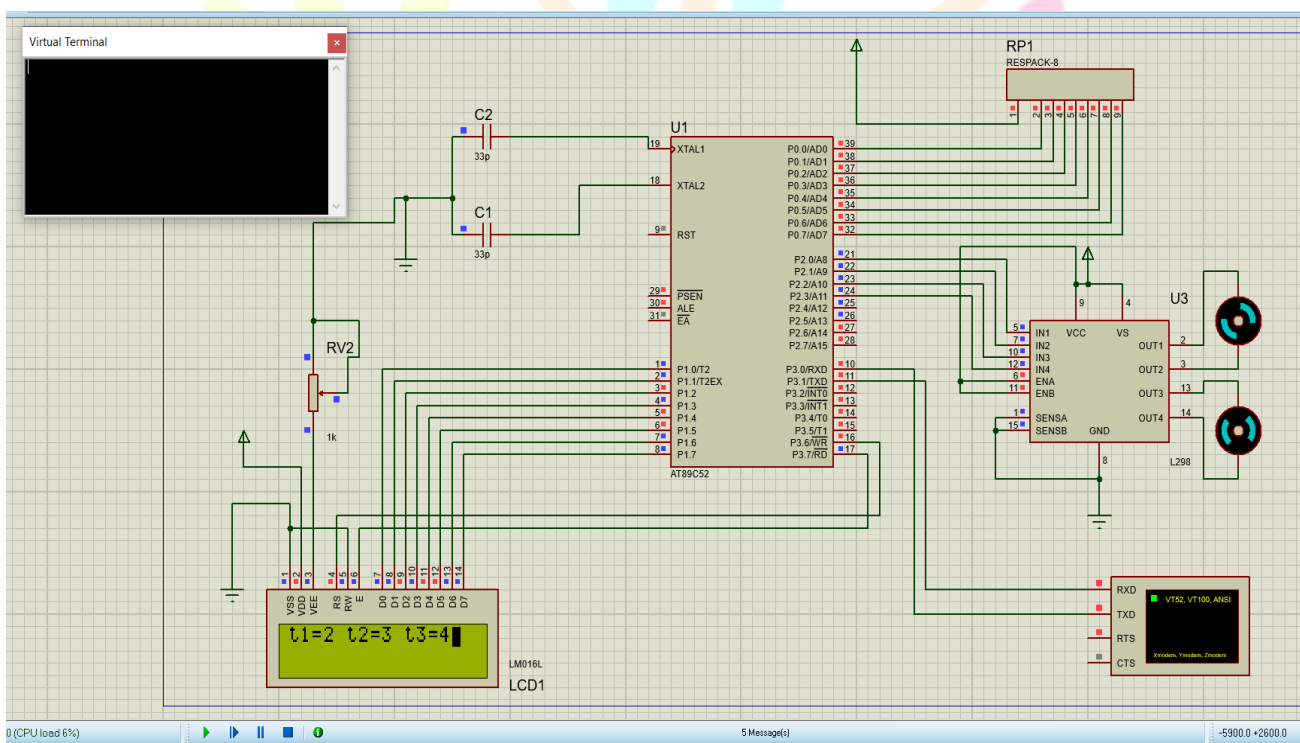
CIRCUIT DIAGRAM :



SOFTWARE WINDOW :



SIMULATION DIAGRAM :



WORKING :

In this machine we have 2 parts; one is hardware part and the other will be software part. The software will be installed on the PC. The both parts are connected to each other through wires for communication. This system is specially designed for the college students. It can be placed in the ladies common room.

The person will first enter the PRN number and password. The system will show her name automatically if the password is correct. Then she can select the size of the pad as per requirement. The system will show its cost on the screen. The user scan payment QR code with the upi id given and the amount. She can scan the code on her UPI app and make payment and press payment is done. Or she can simply press the pay later and the amount will be added to her account which she can pay later.



Then the software will send command to the hardware. The hardware contains a microcontroller through the serial communication port. Here we will use a MCS51 or AT89S52 microcontroller. The LCD display will show the instruction for the user to collect the pad from the machine's outlet. There will be 3 different dc motors for 3 different sizes of pads, which will push the pad packet out of the machine.

5. CONCLUSION :

The implementation of a sanitary napkin vending machine project aims to address the pressing need for access to menstrual hygiene products in public spaces. By providing a convenient and discreet solution, the project seeks to promote menstrual health and dignity among women and girls. Through careful planning, design, and execution, this initiative has the potential to positively impact communities by ensuring equitable access to essential hygiene products.

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7. REFERENCES :

- [1] Soegoto, Eddy Soeryanto, Dr.Ir.. 2014. Entrepreneurship: Menjadi Pebisnis Ulung. Jakarta: Elex Media Computindo.
- [2] Bodhale, A. P., and Kulkarni, J. S. 201. Case Study on Different Vending Machines. International Research Journal of Engineering and Technology (IRJET). pp. 3531-3535.
- [3] Cardaci, R., Burgassi, S., Golinelli, D., Nante, N., Battaglia, M. A., Bezzini, D., and Messina, G. 2016. Automatic Vending Machines Contamination: A Pilot Study. Global Journal of Health Science, 9(2),pp. 63.
- [4] Das, N., Mandal, R., Mitra, A., Maiti, B., Nandy, S., and Datta, D. 2018. FPGA Based Vending Machine