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Smart Sanitizer Vending Machine

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ABSTRACT

Smart sanitizer vending machine is automated, non-contact, alcohol-based hand sanitizer dispenser, which find it's utilized in hospital, workplace, office, dispenser, which finds it's use in hospitals, work places, offices, schools and far more. Alcohol is largely a solvent, and also a really good disinfectant compared to soap or solid soap, also it doesn't need water to clean off since it's volatile and vaporizes instantly after application to hands. it's also proven that a degree of >70% alcohol can kill Coronavirus in hands. Here, an ultrasonic sensor senses the hand placed near it, the Arduino Nano is employed as a microcontroller, which senses the gap and also the result's the pump running to pump out the hand sanitizer. The IR Sensor is used for sensing the bottle detection. The pump is connected to an Arduino Nano to control the flowing liquid of the sanitizer. Red LED and Buzzer is employed for the user to know that the setup is in working mode.

Keywords: Arduino Nano, IR Sensor

1. Introduction

The corona disease may be a major problem future world. As there's a severe attack on this world, the people are plagued by the corona disease. The corona disease isn't any other virus attack, it makes severe damage to the human body by infecting the respiratory. The virus is heavily spreading within the world, despite the nations attempts to watch and maintain the spread of corona within the nation and other nations. There's a strict evaluation everywhere to regulate the spread of corona disease. The hospital and also the nursing staff are suffering to cure the affected people and stop spreading the virus to the neighboring people. As there's an impression in using the hand wash sanitation by foot or by pressing the sanitizer bottle accustomed have a variety of the virus disease from one human to a different. a protracted press is created with the footer, such that the mechanical force sprays out the Sanitizer liquid. Aged people are unable to use this technique as there's mechanical stress involved and the risk of touch can't be ignored. The Smart Sanitizer Vending machine with Arduino, has the Arduino microcontroller to manage the sanitizer liquid with the assistance of a DC pump. This can be accustomed to power up the system by the external power supply of 12V battery. This method is easy to use and therefore the advantage is that there is no need of battery replacement for the usage of the system. The mask and sanitizers provided anywhere to shield the people from spreading the virus and to kill the virus from the human hand. The virus is spreading from the human hand and mouth saliva. The mouth spread is controlled with the mask cloth and also the human hand is controlled by the hand wash sanitizer. The hand touch while pressing the dispenser usage also spreads from human to human. There should be an automatic hand sanitizer vending machine, to manage and maintain the spread from human to human.

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2. Literature Survey

A complete Personal Hygiene awareness goes beyond providing the correct products. While having wall-mounted Hand Sanitizer Vending Machines on places in and near germ hotspots is important to improving the health. The importance of properly use of Hand Sanitizer is suggested by the planet Health Organization to confirm our health with hand hygiene best practices. Using Hand Sanitizer slot machine reduces microbial counts and kills many harmful germs that might infect with the flu and other viruses. so as to stay the a healthy and thriving environment, providing hand sanitizer machines for employees/students etc at various locations within the Work places/Schools, is simply as essential as providing the correct equipment and tools to try to to their job. While providing sanitizers at key locations throughout the Workplaces, Schools, Colleges, Hospitals etc encourage workers/Students to use and practice hand hygiene. When schools, Colleges reopens- Promoting and practising the employment of Hand Sanitizers is vital to form sure that our Children's, Students, Employees etc remain protected. we've got to supply information about a way to protect themselves by practising personal hygiene. John M. Boyce, M.D.and Didier Pittet, M.D talked about the importance of hand washing with individual cleanliness. For ages, hand washing with cleanser and water has been viewed as a proportion of individual cleanliness. the concept of purging hands with a germicide specialist presumably rose within the mid nineteenth century. As earlier than schedule as 1822, a French drug specialist exhibited that arrangements containing chlorides of lime or beverage could destroy the foul smells related with human bodies which such arrangements might be utilized as disinfectants and sterilizers. in an exceedingly paper distributed in 1825, this drug specialist expressed that doctors and different people visiting patients with infectious illnesses would profit by soaking their hands with a fluid chloride arrangement. R. MoninaKlevens, et al., used a multi-step approach and three data sources. the most source of knowledge was the National Nosocomial Infections Surveillance (NNIS) system, data from 1990–2002, conducted by the Centers for Disease Control and Prevention. Information from the National Hospital Discharge Survey (for 2002) and therefore the American Hospital Association Survey (for 2000) were utilized to boost NNIS information. the amount of patients with a HAI whose passing was resolved to be caused or connected with the HAI from NNIS information was utilized to measure the number of passing. (Sources from the American health bulletin)

3.Methodology

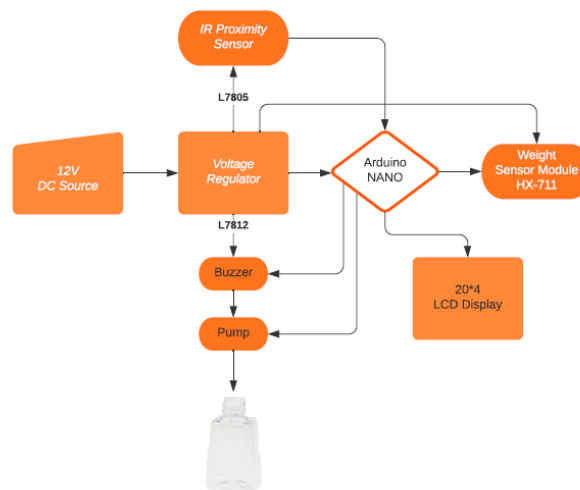


Fig 1. Block Diagram

A 12V DC source powers the entire circuit including the Arduino NANO board, 20*4 LCD display , load cell with HX-711 module and IR sensor. The two voltage regulators L7812 & L7815 are used to control the voltage coming from the source and prevent overload on the components in the circuit. These two voltage regulators are attached with heat sinks. L7812 powers the buzzer and pump while the L7805 is used to power the Arduino NANO board, 20*4 LCD display, load cell with HX-711 module and IR sensor. The 20*4 LCD display is connected to the Arduino NANO board via I2C module. It displays the information which is relevant to the project. The Arduino NANO board is coded such that whenever a container is placed it senses the container with the help of the IR sensor. If the bottle is missing the buzzer will be activated and a message will be displayed on the LCD panel. When an empty bottle is placed, the IR sensor senses the bottle and the load cell will determine if the bottle is empty. The pump will then be activated and then fill the empty bottle with the required amount of liquid. An indicative message of the bottle being completely filled will then be displayed on the LCD

Vin: It is modulated DC supply voltage which is used to regulate the ICs used in connection. It is primary voltage for ICs on the Arduino NANO board. Digital pins in the Arduino NANO board are total 14. Arduino digital pins can read only two states: voltage signal or no signal, in short 1 or 0. Pin D4 is connected to pin 2(data) of HX-711. PIN D5 is connected to pin 3(SCK/Serial Clock) of HX-711. PIN D6-D9 are fed 5V from the OUT terminal of L7805 via the 12mm tactile switches which then send o/p signal to the pump via D882 transistor. PIN D10 gives o/p to the buzzer via 1K ohm resistor and transistor BC 547. Buzzer is activated right before the Pump. The Pump and buzzer are powered by the terminal 3(OUT) from the L7812 transistor. A4/A5 are the 2 I2C pins used to send and receive data- The SCL(serial clock pin)/SDA(serial data) are connected to SCL/SDA pins i.e. pin4/3 of the I2C module connected to the 20*4 LCD display.

4. Results

The project has been successfully tested and as a result gives out consistent results when put to the use. The exact amount of liquid is given out via the pump with consistent flow.

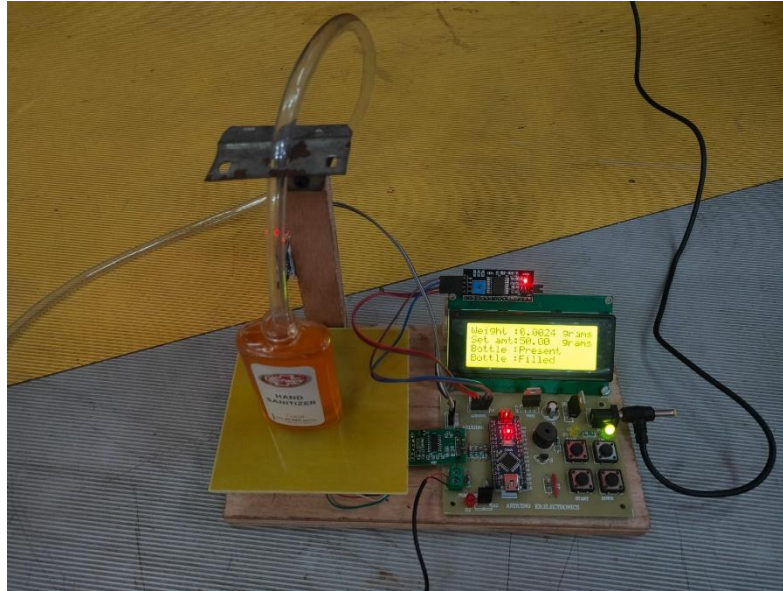


Fig .3 Working Model

5. Conclusion

Implementing of Smart Sanitizer Vending Machine for Sanitation is efficient and the cost price is minimized. It works like the normal contactless automatic machine. The human gets the limited sanitizer liquid for sanitation in hand, to wash the hands and to protect themselves from the corona disease. This system can be utilized in malls, high populated areas. The economic cost of the seminar, it will be better quality when considering the life of the system and the seminar. The most goal of this seminar was to use current advanced technologies to develop an Automatic hand sanitizing machine to improve hygiene and prevent the infectious viruses entering our body. Automatic hand sanitizers are priced less when compared to any other hand sanitizing tools or dispensers. At the same time it is environment friendly as because the disposable wastage is very minimal, since it can be refilled easily without any technical assistance. These automatic hand sanitizer machines are developed keeping in mind about its affordability by underprivileged sections of the society as it can be purchased by lower income groups in pursuit of their well-being and also they are easily available and can be used by everyone without any hassle.

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