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COVID-19 KILLER ASSISTANT

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ABSTRACT

COVID-19 is an infectious disease that first emerged in humans at the end of 2019. It spreads through small droplets that are released from the mouth or nose of an infected person, usually through coughing or sneezing. This disease can be prevented by practicing a clean and healthy lifestyle. One way to do this is by frequently washing hands using hand sanitizer. The use of hand sanitizers generally involves physical contact between users, so automatic hand sanitizers are needed to reduce physical contact. The principle of an automatic hand sanitizer is that when hands are brought close to the sensor on the dispenser, the pump on the dispenser bottle automatically dispenses the sanitizer onto the palm of the hand. The sensor on the dispenser bottle utilizes technologies like IR sensors to detect the presence of hands and trigger the automatic operation of the dispenser. There are also ultrasonic sensors used to detect the liquid level inside the dispenser bottle. The purpose is to detect a low level of sanitizer to replenish it and prevent empty dispenser bottles. This automated hand sanitizer produced is called the COVID-19 Killer Assistant.

Keywords: Hand sanitizer, COVID-19 and sensors

1. INTRODUCTION

COVID-19 (or coronavirus disease 2019) is an infectious disease caused by the SARS-CoV-2 virus (severe acute respiratory syndrome coronavirus 2). This disease was first detected in Wuhan, China, in late 2019 and has since spread worldwide. COVID-19 spreads through small droplets expelled from the mouth or nose of an infected person, primarily through coughing or sneezing, as well as close contact with an infected individual. Symptoms of COVID-19 include fever, cough, shortness of breath, fatigue, headache, loss of taste and smell. The disease can be prevented by adopting a healthy lifestyle, such as using face masks, practicing social distancing, avoiding crowded places, and regularly washing hands. Thus, the COVID-19 Killer Assistant is created to prevent the spread of the COVID-19 disease outbreak.

2. LITERATURE REVIEW

The hand is a part of the human body used for interacting with other people, such as shaking hands, the process of giving or receiving something, and other interactions. Considering that Covid-19 is a contagious disease transmitted through touch, the use of hand sanitizers is strongly encouraged to prevent the spread of COVID-19. According to the study by Andi Zulkifli (2021), manually operated hand sanitizers are less practical as they still involve physical contact with the sanitizer dispenser. By using an automatic hand sanitizer with Arduino ATMEGA 328 as the main processor, the transmission of COVID-19 can be reduced. Another study conducted by Ika Miranti (2021) also produced an automatic hand sanitizer but used Arduino Nano as the main processor. There is also research using Arduino Uno as the main processor, as conducted by Ichwan Purwata (2022) and Norfadhilah (2023).

3. METHODOLOGY

The COVID-19 Killer Assistant is an automatic hand sanitizer that operates using an IR sensor. When someone places their hand under the dispenser, the sensor detects the presence of the hand and activates the dispenser. Subsequently, the dispenser dispenses a predetermined amount of hand sanitizer onto the person's hand. This COVID-19 Killer Assistant also features a bar of LED lights that indicate the sanitizer level using an ultrasonic sensor. The information from the ultrasonic sensor is sent to the LCD display to show text indicating whether the sanitizer is full or needs a refill. The entire process of the COVID-19 Killer Assistant is fully controlled by NodeMCU. A block diagram is a brief way to illustrate the relationship between inputs and outputs in the system. The block diagram design for the COVID-19 Killer Assistant is depicted in Figure 1.

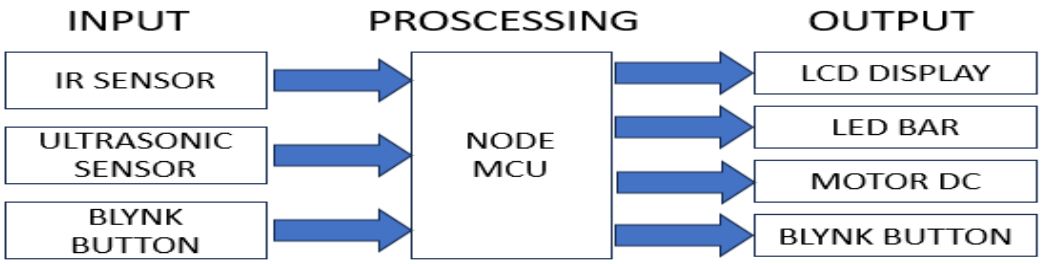

Figure 1: Block Diagram of the COVID-19 Killer Assistant

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4. RESULTS AND DISCUSSION

The flowchart depicted in Figure 2 illustrates the detailed operation of the COVID-19 Killer Assistant specially designed to function automatically. This flowchart delineates a series of sequential steps defining the functions of this device's system. The process begins by powering up the system and activating its components. Once activated, the ultrasonic sensor starts detecting the content of the hand sanitizer dispenser. As soon as the sanitizer content is detected, the readings are displayed on the LCD screen to indicate the current level of sanitizer content. Simultaneously, the LED lights illuminate according to the sanitizer content present in the dispenser. The IR sensor comes into play when detecting the presence of a hand. Upon detecting hand movement and presence, the pump motor starts suction to dispense the hand sanitizer. The program is configured to dispense the sanitizer for 2 seconds, typically sufficient for cleaning both hands. Afterward, the system returns to its original state and is ready to detect the next movement. If no movement is detected, the system remains in a standby mode to prevent unnecessary dispensing of sanitizer.

The use of the COVID-19 Killer Assistant is a cleaner and more convenient way to clean hands. This is because it is a hands-free device that eliminates the need to touch or press buttons, reducing the risk of spreading germs or viruses. The appropriate placement for the COVID-19 Killer Assistant is in high-traffic areas such as schools, supermarkets, or offices to encourage the public to clean their hands frequently. Moreover, it can help reduce the wastage of hand sanitizer as it dispenses a predetermined amount of sanitizer. The LCD display also provides information to prompt refilling of the sanitizer into the dispenser.

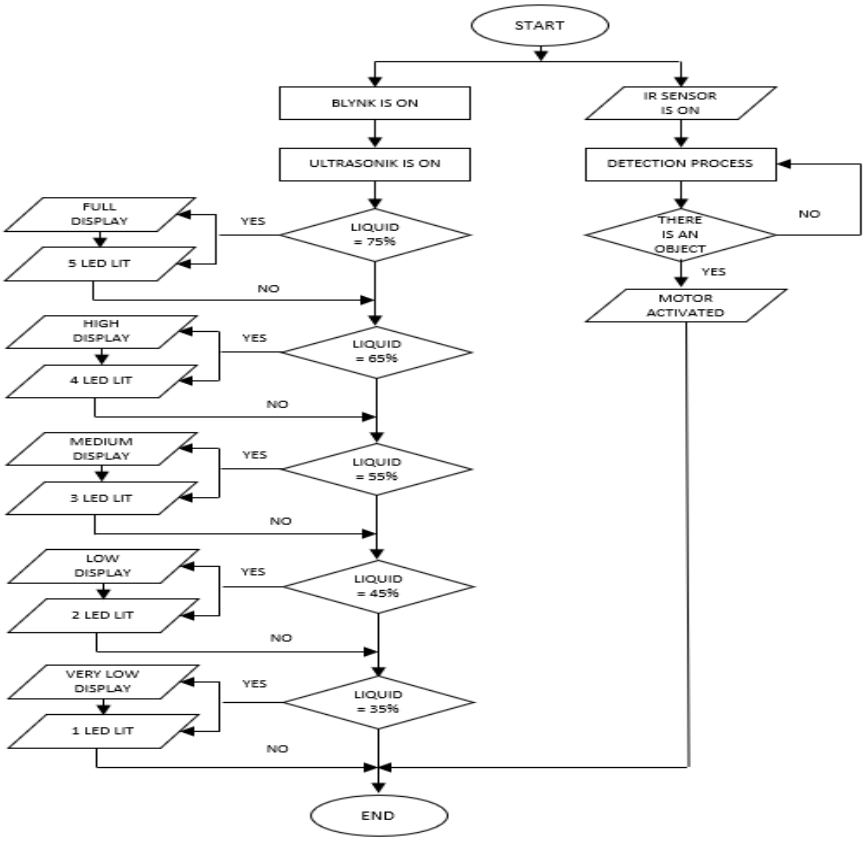

Figure 1: Flow chart of the COVID-19 Killer Assistant

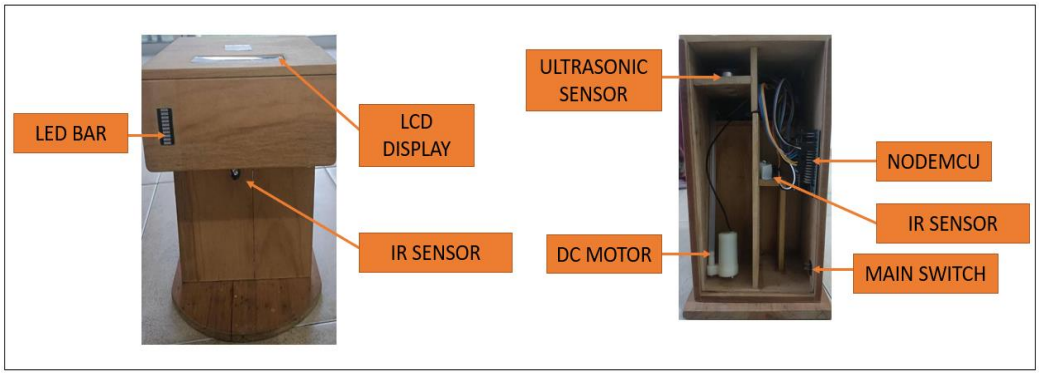

Figure 1: Component placement the COVID-19 Killer Assistant

Table 1 below shows the study conducted to determine the levels of liquid content in hand sanitizer. Five liquid content levels in this hand sanitizer are detected using an ultrasonic sensor. The ultrasonic sensor will detect five levels of hand sanitizer liquid content, namely 15cm, 13cm, 11cm, 9cm, and 7cm. Each detected distance will display the reading of the hand sanitizer level on the LCD screen, and the LED lights will also illuminate according to the level of liquid content.

Table 1. Readings of Distance and Levels of Liquid Content in the COVID-19 Killer Assistant

Readings of Hand Sanitizer Content	Level of Hand Sanitizer Content	LCD Display	LED Indicator
1. Full	15cm	FULL	5 LED Lit
2. High	13cm	HIGH	4 LED Lit
3. Medium	11cm	MEDIUM	3 LED Lit
4. Low	9cm	LOW	2 LED Lit
5. Very Low	7cm	VERY LOW	1 LED Lit

5. CONCLUSION

In conclusion, the COVID-19 Killer Assistant is an essential tool for maintaining good hygiene and reducing the spread of germs and viruses. This touchless device is easy, clean, and efficient, encouraging frequent hand cleaning. It can also prevent the wastage of sanitizer fluid, and the LCD display ensures that the dispenser is refilled promptly. Overall, the COVID-19 Killer Assistant is a tool that promotes cleanliness practices and creates a safer and healthier environment.

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