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Design and Development of a Touchless Hand Sanitizer Dispenser Machine

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Abstract- The epidemic of COVID-19 has heightened awareness of personal health and cleanliness. Wearing a protective face mask, maintaining social distance, and often washing your hands with soap or hand sanitizer are a few precautions to take during this epidemic. Sharing and mass usage of hand sanitizer bottles may contribute to the transmission of coronavirus; therefore, automatic hand sanitizer dispensers in public settings such as businesses, offices, and schools are a practical solution to provide touch-free hand sanitization. The concept and development of a low-cost automatic hand sanitizer dispenser are presented in this work. It is created in such a way that the overall price can be decreased without compromising the structure's integrity. There are precautions in place to prevent the spillage and evaporation of alcohol-based sanitizer, hence preventing potential fire concerns.

Keywords: Covid -19, Automatic sanitizer dispenser, proximity sensor, touch-free

I. INTRODUCTION

Diet, hygiene, and exercise are the prerequisites for a healthy lifestyle. As a result of the global spread of the COVID-19 pandemic, human health and life are in danger. Prevention is always preferable to treatment for pandemics of this type [1]. Every individual must avoid virus-infected environments and maintain their own and their surrounds' health and cleanliness. To prevent the spread of the Corona Virus, personal protection and hygiene in public places are required, and can be attained through the use of face masks, social isolation, UV sterilization boxes [2] for personal items such as mobile phones, wallets, etc., and frequent hand washing with soap and water [3]. Whereas hand washing will not be possible everywhere due to a lack of infrastructure, the significance of hand sanitizing with an alcohol-based sanitizer has come to the forefront [4].

An infected person may contaminate an object with the new coronavirus by coughing, sneezing, or touching the thing. Preliminary data indicates that the new coronavirus can persist on surfaces for several hours, regardless of whether they are made

of plastic, steel, PVC, or paper. The risk of contracting the new coronavirus through contact with coins, banknotes, credit cards, and other objects such as mobile phones, e-commerce couriers, and products is extremely high, and there is a lack of sanitizing devices to sterilize instruments in hospitals due to the likelihood of covid-19 spreading among patients and infants. Although we use various devices in these locations, they are less effective and require significant maintenance, such as increasing amounts of liquid sanitizer, as well as releasing chemicals that are detrimental to the environment and skin.

Hand sanitizers are products that are applied to and cleansed off the surface of the hands in order to destroy harmful bacteria. These sanitizers are designed to dry rapidly after application, eliminating the need for washing, water, and drying aids such as towels [5]. There is a global effort to contain the COVID-19 virus and prevent its global spread. All hospitals and nurses have been burdened with treating the sick individuals and preventing the virus from spreading to their neighbors. The architecture described in [6] employs a control system without a microprocessor to make the automated sanitizer dispenser economical. The author employs an infrared (IR) sensor for hand detection, which comprises an IR LED, photodiode, and comparator. However, the sensitivity of this sort of sensor changes with the intensity of sunlight, making it unsuitable for outdoor use.

A microcontroller (Arduino Uno)-based automated hand sanitizer dispenser is proposed in [7]. Here, the author scans for the existence of a hand using an ultrasonic sensor. The sanitizer is pumped by a 3-12V submersible pump that is operated by a relay. As a result of the usage of microcontrollers and ultrasonic sensors, its overall stability can be enhanced, but it is prohibitively expensive. The authors of [8] conducted considerable study into the mechanisms of action of hand sanitizers and compared the efficacy of soap-based and alcohol-based hand sanitizers. They determined that a sufficient amount of alcohol-based hand sanitizer is required to guard against COVID-19 transmission via the hands.

The authors of [9] conducted research to determine if ordinary hand sanitizer dispensers are