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Automatic Vegetable Sanitizing Machine

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ABSTRACT: In this Covid 19 pandemic period which is a global outbreak, hygiene is the core preventive measure in the spread of the disease as advised by World Health Organisation which includes washing hands and sanitizing the things around us regularly. Hygiene refers to the practices conducive to maintaining health and preventing disease especially through cleanliness. To maintain hygiene many task are added to us like sanitizing the vegetables and groceries. The sanitizer used here is a vegetable sanitizer made up of mild surfactant derived from natural fatty acid and natural raw material glucose. This formula not only frees vegetables from germs, viruses and bacteria but also removes wax. This research paper aims to design and implement a low cost IoT based automatic vegetable sanitizing machine. The smart vegetable sanitizing machine is stationed at the entrance of the door before entering in, we can keep our vegetables/fruits/groceries before the machine on the rotating table. The Arduino UNO is used as a microcontroller and is connected to a periliastic pump and Bluetooth HC05. By giving the instructions from mobile phone to the Arduino through Bluetooth the pump starts spraying the liquid for specified time.

KEYWORDS: Covid19, Hygiene, Vegetable sanitizer, Microcontroller, Dispenser, Bluetooth HC05.

I. INTRODUCTION

Coronavirus has rapidly spread to many parts of the world and number of countries are in complete or partial lockdown and many countries are affected by the covid second wave. Our country is in its unlock phase we have to be very careful during this period. Governments are trying their best to ensure supply of essential commodities to the public during these testing times. Food safety and handling is of utmost importance right now. Coronavirus has made everyone aware of the products they consume. It is important to wash the products carefully. There are number of people reporting to practices such as washing the fruits and vegetables with soap or detergent before consumption which is not safe for our health. Cleaning the vegetables is important but it should be safe for our health. The vegetable sanitizer used in our project is made up of mild surfactant derived from natural fatty acids which is safe for us to use. Our project not only aims for the current pandemic but also other contagious disease for future references. This outbreak has lead to many add on task on our busy lifestyle. Our project aims to reduce the sanitizing work by using the automatic vegetable sanitizer. By placing the vegetables on the rotating table we can send the instructions from our mobile phone to the Arduino via Bluetooth, the pump starts spraying a specified amount of sanitizing liquid over the Vegetables placed on the rotating table for the specified period of time. The rotating table rotates till the entire sanitizing process is completed so that the entire vegetable or grocery is sanitized.

II. LITERATURE SURVEY

PAPER: Novel corona virus Disease (covid-19) smart contactless hand sanitizer –dispensing system using IOT based Robotics Technology

Year: 2019

Author: Eddy Yusuf , M.N. Mohammed ,Ismail I Daood,Siti humairah kamarul Bahrain ,s.alzubaii , Omar Ishmael Al-sanjary,sairah A.K.

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DOI:10.24205/03276716.2020.1022



METHODOLOGIES: The functioning of the robotic hand sanitizer dispenser seems to be very simple and effective as one simply needs to wave their hands near the infrared distance sensor (IR sensor) and instantly the sanitizer gets ejected from the bottle into the awaiting palms.

MERITS: It is capable of dispensing hand sanitizer in a contactless manner

DEMERITS: • Cost of readymade hand sanitizer is high.

III. METHODOLOGY

Block Diagram of Proposed System

The automatic Vegetable sanitizer works on the basis of the instruction given by the human beings using Mobile phone to the Arduino through the Bluetooth sensor. Arduino controls a Perilastic pump and Servo motor with the help of the Bluetooth Sensor. The block diagram will gives us an idea how the automatic vegetable sanitizer developed.

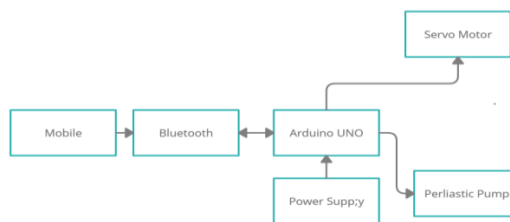


Fig. 1:Block diagram of Automatic Vegetable Sanitizer

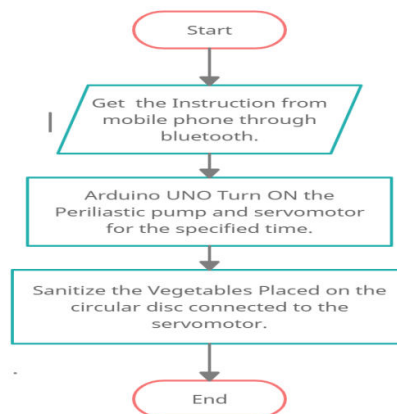


Fig. 2: Flow Chart of Automatic Vegetable Sanitizer

Working

The Bluetooth application has to be installed in our Mobile phone for giving an instruction. The Application consists of 5 two way switches for controlling the spraying and rotating period of pump and motor respectively. This device is capable to sanitize the Vegetable up to 5 kilograms. The first switch is used for sanitizing a vegetables up to 1KG for a period of 30 seconds and Second Switch is used for sanitizing a vegetables above 1KG to below 2 KG for a period of 1minute.Like wise all Other 3 switches are used for sanitizing a vegetables for higher weights up to 5KG.



First, The Bluetooth Connected to the Arduino will paired with the Mobile Phone having Bluetooth Application. The command passed from the mobile phone to the Arduino through the Bluetooth makes the Arduino to control the Periliastic Pump and the Servo Motor. So, the Vegetables placed on the rotating table will sanitized completely by sanitizer sprayed from the pump for a specified period of pump.

The Table Shows the Period of Sanitization of the vegetables according to their weight.

Table 1

SI NO	Weight in Kilo Grams	Period of Sanitizing in Seconds
1	0-1	30
2	1-2	45
3	2-3	60
4	3-4	75
5	4-5	90

Hardware Setup

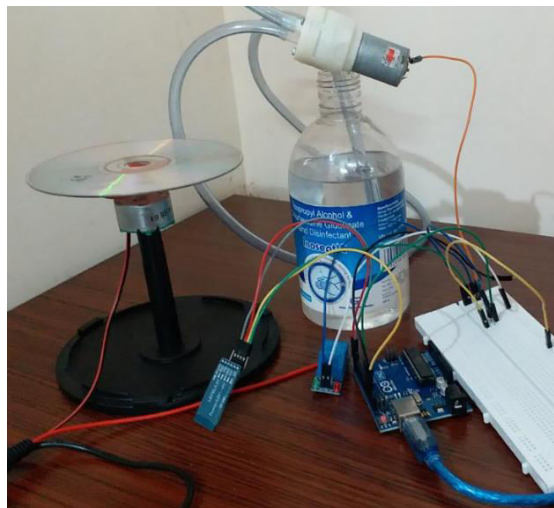


Fig.3: Hardware setup of the Automatic Vegetable sanitizer

Arduino UNO:

The Arduino UNO is an open source microcontroller board based on the microchip ATMEGA328P microcontroller and developed by arduino Cc. The Arduino board is equipped with sets of digital and analog signals both input and output pins that interfaced with various expansion board and various circuits. This board has 14 digital I/O pins and 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment).



Fig 4. Arduino UNO



From the above specifications arduino is used in this project as Arduino is an open-source electronics platform that is used as hardware and software. Arduino boards are able to read inputs such as light on a sensor, a finger on a button, and turn it into an output and for turning on LED lights etc... The Bluetooth connected to the Arduino will be paired to a mobile phone. The instruction is sent from the mobile to the Arduino via Bluetooth. The Arduino controls the periliastic pump and the pump starts spraying the sanitizer for the specified time.

Bluetooth module:

The Bluetooth module we used in this project is the Bluetooth HC-05.HC-05 Bluetooth Module is an easy to use Bluetooth with Serial Port Protocol module which is designed mainly for wireless serial connection. HC-05 Bluetooth module provides switching mode between master and slave mode so that we can use neither receiving nor transmitting data.

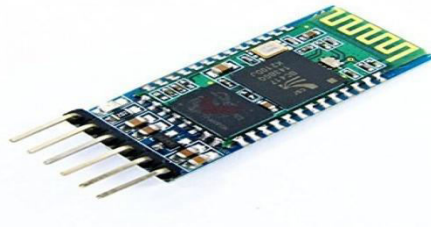


Fig 5. Bluetooth module

The Bluetooth modules can transmit and receive the data wirelessly by using two devices. Its specifications are, it uses the 2.45GHz frequency band. The transfer rate of the data can vary up to 1Mbps and is in short range of 10 meters. The HC-05 module can be operated within 4-6V of power supply. With this specification we use Bluetooth HC-05 in this project we need to pair the Bluetooth module with smartphone or else download the Bluetooth app. Power the Arduino board, turn on Bluetooth HC-05 on the Android phone and select the required quantity of sanitizing liquid based on the quantity of vegetables.

Advantages

- 1) Cost of the Automatic vegetable sanitizer is less.
- 2) No need of human intervention
- 3) It mainly used for covid situations
- 4) Required amount of sanitizer is used based on the quantity of vegetables
- 5) Good for health.
- 6) Cost of Home Made sanitizer is less.
- 7) Protect people from viral and bacterial disease

Disadvantages

- 1) Cost of Ready Made sanitizer is High.

Application

- 1) It can be used in houses
- 2) Used in small hotels
- 3) Used in hostel mess.



IV. RESULTS



Fig 6 Result

Automatic vegetable sanitizer is designed to use the mobile phone and Bluetooth to sense and transmit the message from the user (or) human beings. The message from the device is transmitted to arduino UNO. The message from the device is transmitted to arduino UNO. The UNO control the periliastic pump and rotating motor to spray the sanitizer on the vegetables placed over the disc connected to the servomotor.

V. CONCLUSION

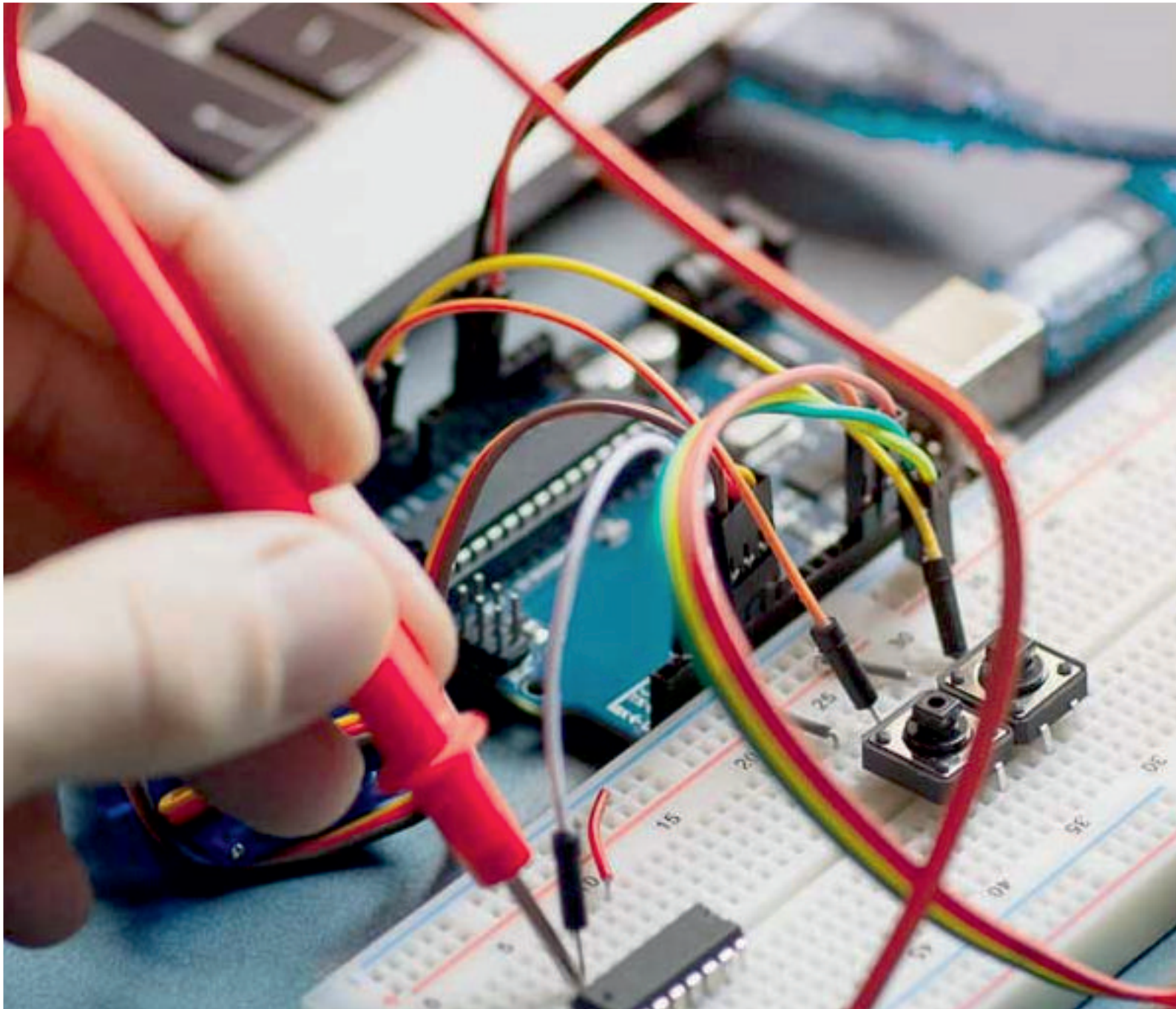
However, there are some limitations in the proposed solution they can be addressed in the future implementations. Hence, the following features are recommended to be incorporated in the future versions. Automatic vegetable sanitizing machine is designed by considering the cost of the materials. It can be further implemented by using the GSM module where the machine can be controlled over long distance than Bluetooth module. If GSM module is been implemented we can operate our sanitizing machine even from our workplace and outstation. Presently Bluetooth module is been used which can operated only within few meters. The system will surely help in implementing the hygiene without any challenges as it is a must to sanitizer if you are to access any entry point. It is much safer and more recommended due to its touch less property which zeros down any chances for cross contamination. This is a low cost user friendly system that anyone can make use of. All the devices communicate well. It can be concluded here that the system has been successfully implemented and the aim is achieved without any deviations. The results achieved in this project are genuine and are a product of sincerity and hard work.

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