5.8.3 Development activities

Provide details:

- Product Development
- Research laboratories
- Instructional materials
- Working models/charts/monograms etc.

5.8.3.1 Product Development:

The products developed in the department are listed below.

01. Design and Development of Seam Sealing Machine – PPE Cover all for Covid 19

Team Members – Dr D SenthilKumar, Dr K G Saravanan & Prof V Kaviarasan, S.Pandirajan

- Design and development of Seam Sealing Machine, the purpose of this machine is to seal the seams in the garment using special tape. Sealed seams should not allow any liquid/virus etc., the project which includes Design of electrical circuits & assemblies, fabrication and assembling all machine components. Design in such way that it should serve the purpose (Quality seam sealing).
- Designing hot air gun sub assembly, electrical components which include PLC design, motors design etc. Integration of all the mechanical and electrical components as per the design. Selection of temperature and type of sealing and all variable selection (according to properties of fabric materials suitable to manufacturing PPE cover all – Covid 19) based on input from Fashion Technology department.

Photo of Hot Air Seam Sealing

02. Automatic Queue Control System

Team Members: P.Kumaravel, Aparna Srijana K, T.Dinesh, Gokulnathan L

Objective:

The Main objective is to maintain the social distancing between the people to avoid spreading of COVID-19 (Corona) Virus. In the current and post COVID scenario, this can be installed in shopping malls, banks and in college entrances and other places where queues are expected.

COVID 19 (Corona Virus)

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people who fall sick with COVID-19 will experience mild to moderate symptoms and recover without special treatment.

How It Spreads

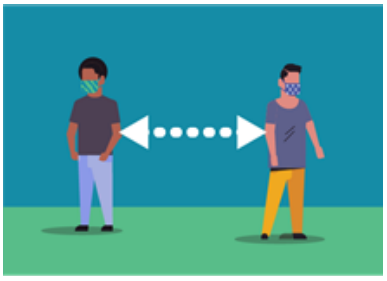
The virus that causes COVID-19 is mainly transmitted through droplets and an aerosol generated when an infected person coughs, sneezes, and a healthy person exhales them. These droplets are too heavy to hang in the air, and quickly fall on floors or surfaces. You can be infected by breathing in the virus if you are within close proximity of someone who has COVID-19, or by touching a contaminated surface and then your eyes, nose or mouth.

Social Distancing:

Limiting face-to-face contact with others is the best way to reduce the spread of coronavirus disease 2019 (COVID-19).

Social distancing, also called “physical distancing,” means keeping space between yourself and other people outside of your home.

As per WHO, to practice social or physical distancing a person must have at least 6 feet (about 2 arms’ length) from other person.



Methodology:

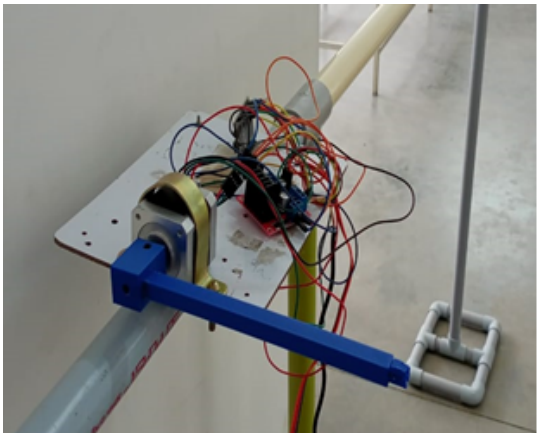
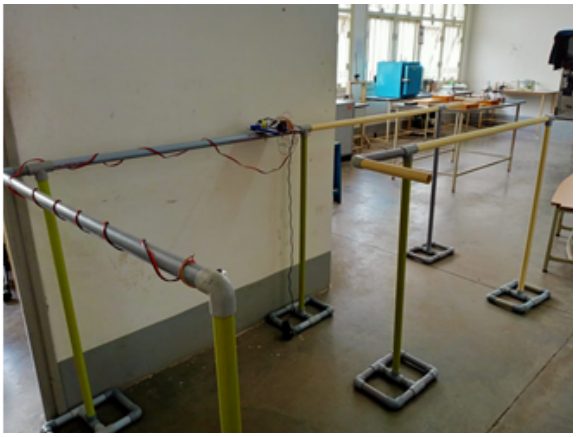
By using the Wi-Fi Module and stepper motor, the shop keeper or controller can open or close the gate. Suppose the person who is entering into the queue is having fever the thermal sensor installed will produce a beep sound. Immediately the controller can take related safety measures as per the guidelines issued by the government.

If a person is standing in a queue and his temperature is not high then the controller will open the gate by using his mobile phone. Automatic hand sanitizer is installed in the queue; the person who is entering into the queue has to use that.

When the person leaves the queue, it will be sensed by the ultrasonic sensor and using that signal gate will be opened.

Components Used

- Wi-Fi Module – NodeMCU
- Arduino UNO board
- Ultrasonic Sensor
- Stepper Motor
- Motor Drive
- Frame
- Mlx 90614 Contactless temperature sensor
- General purpose transistor
- 1k resistor
- Proximity sensor
- Dc Pump
- USB cable
- 12 volt adaptor
- 5V active alarm buzzer module
- Jumper wires

Photos of Automatic Queue Control System

03. Foot Operated Hand Sanitizer Dispenser Stand

Team Members: Dr.D.Senthilkumar, S.Pandirajan, S.Sakthivel

Objective: to control the spread of corona virus from an infected person to others while using the same sanitizer bottle

The purpose of this Foot Operated Dispenser is to control the spread of corona virus from an infected person to others while using the same sanitizer bottle. With this device, the sanitizer could be used without touching the bottle with hands. By pressing the pedal with a foot, the bottle would dispense the liquid.

This device is mainly designed for use at common places (can be placed near entrance), colleges, buildings, hospitals, clinics, schools, shops, cafes and restaurants, hotels, offices, factories etc

Bottles of different sizes from 250 ml to 1 litter could be fixed and bottle compartment can be adjusted according to the height of the bottle.

The unique simple design of our department, we made an ideal model with low cost.


Photos of Foot Operated Hand Sanitizer Dispenser Stand

04. Fully Automated Sanitizer Tunnel

Team Members: Dr.D.Senthilkumar, S.Pandirajan, S.Sakthivel

This is an automatic sanitizing tunnel. It operates with sensors, when a person enters the tunnel it will sense the presence and sprinkle sanitizer. This fully automatic and contact free sanitizing tunnel machine. Size – Height – 2.5 m, Length – 4.5 m, Width – 1.2 m.

This device is mainly designed for use at common places (can be placed near entrance), colleges, buildings, hospitals, clinics, schools, shops, cafes and restaurants, hotels, offices, factories etc

These sanitizer tunnels are an open-air spray shower for head-to-toe sanitization. The structure has a multiple nozzles to spray the disinfectant. Usually Sodium hypochlorite onto the persons stepping in it. The primary goal for such an arrangement is to minimize the adverse effects and kill the viruses from the person's body.

At the utmost economic consideration in pandemic situation, Our Department has been designed and developed the tunnel with minimal cost with usage of simple materials like flex and steel frames.

Photo of automatic Sanitizer Tunnel

05. Hydrogen Peroxide Sterilization

Team Members: Dr.R.Mohan

Objective: made to make the sterilization process more efficient using vaporized Hydrogen peroxide solution

In the present study, an attempt has been made to make the sterilization process more efficient using vaporized Hydrogen peroxide solution.

In general, surgical instruments and medications that enter an already aseptic part of the body (such as the bloodstream, or penetrating the skin) must be sterile. Examples of such instruments include scalpels, hypodermic needles, and artificial pacemakers and also essential in the manufacture of parenteral pharmaceuticals. Hydrogen peroxide sterilization, also known as hydrogen peroxide gas sterilization, is a low temperature sterilization process commonly used to sterilize heat-sensitive devices.

A hydrogen peroxide sterilization cycle typically requires less time than alternative forms of sterilization, such as ethylene oxide sterilization. A hydrogen peroxide sterilization process involves H2O2 vapor filling the sterilizer chamber, contacting and sterilizing exposed device surfaces. Once the sterilization cycle has completed, the vapor is vacuumed from the chamber and converted to water and oxygen.

Photo of hydrogen Peroxide Sterilizer

5.8.3.2 Research laboratories

01. Centre for Nano Materials / Micro Machining (CNM/MM)

Centre In-Charge: Dr.A.Jegan M.E, Ph.D

Team Members:

Mr.L.Gokulanathan.,M.E.,(Ph.D)

Mr. V. Suresh M.E., (Ph.D)

Mr. S.Sakthivel – Technician

Vision

Aim to setup one the finest advanced laboratory for Micro Machining and Coating

Objectives

Development of Nanostructured materials including coatings; Development of micro ECM (Electrochemical Machining) and micro EDM (Electric Discharge Machining) for manufacturing micro components.