D. Y. Patil College of Engineering

Sector 29, Near Akurdi Railway Station, Nigdi, Pradhikaran, Pimpri-Chinchwad, Pune, Maharashtra, 411044, www.dypcoeakurdi.ac.in,
info@dypcoeakurdi.ac.in

Department of Mechanical Engineering

BE Project 2021-22

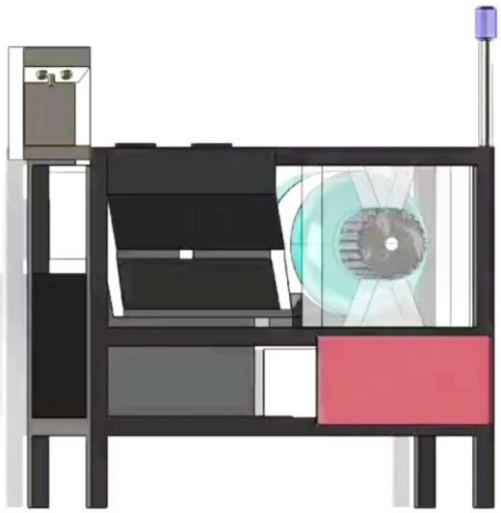
Title of Project: "Dual Working Composite Mask Vending Machine with a Shredding Unit for Destroying Used Waste Masks.**"**

Name of Guide: *Prof*. Shyamsing Thakur.

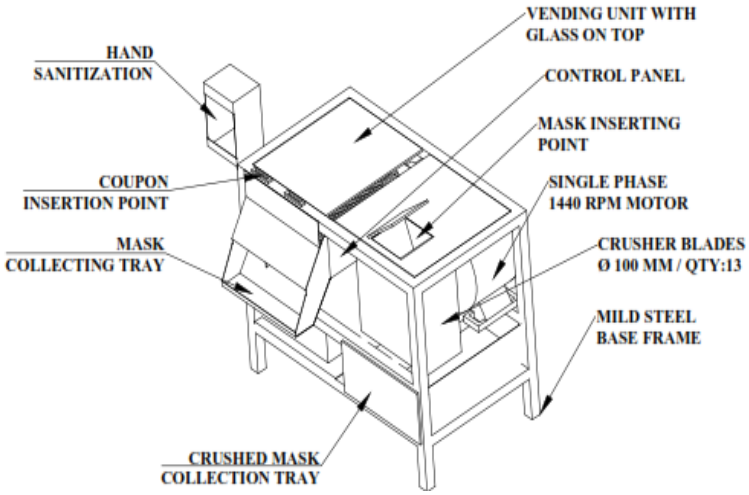
Name of Students:

	Name	Seat No	Mobile No
1.	Harshada Talape	B150081009	7083750812
2.	Akshaykumar Shinde	B150080987	8550925069
3.	Shubham Chaturvedi	B150080997	9765473197
4.	Ritul Tayade	B150081011	8669267195

1. CAD Model of Prototype



2. Detailed Naming of Prototype



Abstract :

Vending machines are more accessible and practical than the convention purchasing method. Now, vending machine market is a big business with huge annual revenue for leading nations like the USA, Japan, China and some other Asian countries including India.

The origin of the novel coronavirus (SARS-CoV-2) and its potential harm to humankind increased the usage of face mask, gloves and safety kits thus escalated Bio-hazardous medical waste in the environment.

Our Project work aims to design a vending machine that can dispense two types of masks N95 & Surgical Mask. Vending Machines have taken a worthy place in the society in order to make an easy and comfortable using for each personality. We have seen a variety of vending machines working for different reasons. Similarly in this period of pandemic, we as a team came with an idea of implementing a composite Mask vending machine and Mask disposable crushing compartment.

Methodology:

In our proposed framework, the vending machine is intended to distribute two types of face-masks of varying costs. The delivery method is spiral coil rotation mechanism with the help of two DC motors which is responsible for delivering the selected mask to the collecting tray.

The machine accepts coins of denominations ₹1 & ₹10. Customer need to insert the mask in crusher canopy, mask will get crushed and then get sanitized using disinfectant sodium hypo chloride solution. For programming and making machine smart, controllers used are- Arduino & proximity sensor. Following are steps involved.

1) Research and Study of Literatures and Research papers related to the project topic
2) Analysis of the findings from literature review and finalising the workflow of the project.
3) Collection of all the hardware and electronic components required for the project
4) Designing and Assembling the Sensors and other hardware components for making complete sensor-based system
5) Building the Model using the checking & accuracy of model by testing it.
6) Integrating the system model inside one composite unit by which we can reduce multiple machines
7) Testing and applying trial and error method to the whole system, and correction if any.

Future Scope:

- The design model will carry the potential to expand its performance based on the growing strategies in the technology such as IOT, AI, ML…
- Vending machines are taking hold of the cashless trend as many people prefer to purchase items with a credit card or debit card. All you need is only a smart phone to scan the QR in Future.
- One can also update the model with a solar version of the machine.
- Providing a thermal reader or covid testing slot in the machine can reduce the crowd at the testing centres.
- As the demand of the vendors is driven, we will make sure to fulfil his needs to develop a preferred model.

Patent Application Number: 202121049036

Patent Status: Published

Publication Date: 07/01/2022

Conclusion:

The intelligence implemented in the vending machine can be achieved by compiling and feeding all the proposed theories and algorithms for Arduino and other sensing technologies into the system. The ability of the system to act on its own can reduce the manpower required at the centre. The experimental results show that the system is intelligent enough to operate the entire system.

Up to project stage -1, This project gave us the chance to learn and work with new tools. We have learned from other disciplines by ourselves about the use of Arduino which helped us to build an embedded system.

In the next phase of project stage 2, we initiated the physical implementation of our project. Next was the actual assembling of parts in CAD software. We also applied for the Patent Application and successfully published the abstract in the patent India journal.

We hope at the end we will be able to complete the project successfully and able to deliver the prototype on time.

Costing of Project:

SR NO	NAME OF COMPONENT	PRICE(INR)
1	Arduino	₹800
2	Adaptor 12-volt 2Amp	₹300
3	DC motor 10 rpm	₹150x2 i.e., ₹300
4	Helical Spring	₹600x2 i.e., ₹1200
5	Portable Crusher (13 Blades)	₹2100
6	Benzene Gas bottle	₹800
7	Metal rigid Structure	₹2765
8	Other Raw Materials	₹1500
	TOTAL COST	**₹9,765**