SOCIAL BENEFICIAL INNOVATION PROJECT PROPOSAL - 2021

Self-Employment for Economically Backward Women through Low Cost Vermicomposting

DEPARTMENT OF CIVIL ENGINEERING

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

TRINISHA PRAGASHINI FERNANDO,
VARSHAA,
LEVETHA.L,

Chennai - 600024
12/8/22

From

SBI Project team (Civil department),
Meenakshi Sundararajan Engineering College,
Kodambakkam, Chennai-600024.

To

The Secretary,
Meenakshi Sundararajan Engineering College,
Kodambakkam, Chennai – 600024.

Sub: Regarding SBI project estimation and funding support

Respected Madam,

The Department of CIVIL has been selected for the next stage of SBI, proceeding further to build the products we need your funding support to achieve our plan. We have derived the total estimation (per product) required to convert all the prototypes into products. So we request you to kindly approve the estimation and release the initial funding to develop our products. Kindly find the project details and estimation report attached along with this letter.

Please do the needful.

Thank you.

Yours Sincerely,
SBI Project Team

TRINISHA PRAGASHINI FERNANDO,
VARSHAA,
LEVETHA.L,

Department Project In-charge: Dr L.Ramajeyam(Head of the department, CIVIL)

VERMICOMPOST BIN

Staff in-charges:

1. Mrs. G.MaliniGayathri
2. Mr. N.RaviKumar

Team members:

TRINISHA PRAGASHINI FERNANDO
VARSHAA
LEVETHA.L

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
DEPARTMENT OF CIVIL ENGINEERING

COST OF VERMICOMPOST BIN

S.NO	DESCRIPTION	QUANTITY	AMOUNT	AMOUNT PER BIN
1	EARTH WORM	2KG	1200	40
2	BUCKET	30	9000	300
3	TAP	30	750	25
4	PERFORATED PLASTIC TRAY	30	1920	64
5	RED SOIL	2 BAGS	600	20
6	YELLOW BAG (FOR MANNURE) + STICKER	30	3000	100
TOTAL			16,470	549

Self-Employment for Economically Backward Women through Low Cost Vermicomposting

Abstract

There is a growing realization that vermicomposting provides the nutrients and growth enhancing hormones necessary for plant growth. The fruits, flowers and vegetables and other plant products grown using vermicompost are reported to have better keeping quality. A variety of approaches and design has been developed for vermicomposting systems, but the basic principle is the feeding of acceptable organic materials to earthworms in continuous or batch culture, and the collection of processed waste that ultimately consists of stabilized castings. A tank in our college campus with a dimension of 165 cm × 184 cm × 80 cm was used. All the required organic raw materials were added into the pit and was made sure no toxic waste was added. The pit was covered with jute bags and waster was sprinkled as regular intervals to maintain the temperature. Later we are planning to distribute 30 buckets of compost, each bucket contains- soil, coconut coir, dry leaves, waste and compost with earthworm. After the compost is ready they can prepare their own batch of compost by adding only the raw materials needed, using this method numerous cycles of compost can be yielded, plus clear guidelines were also given to prepare the compost easily.

INTRODUCTION

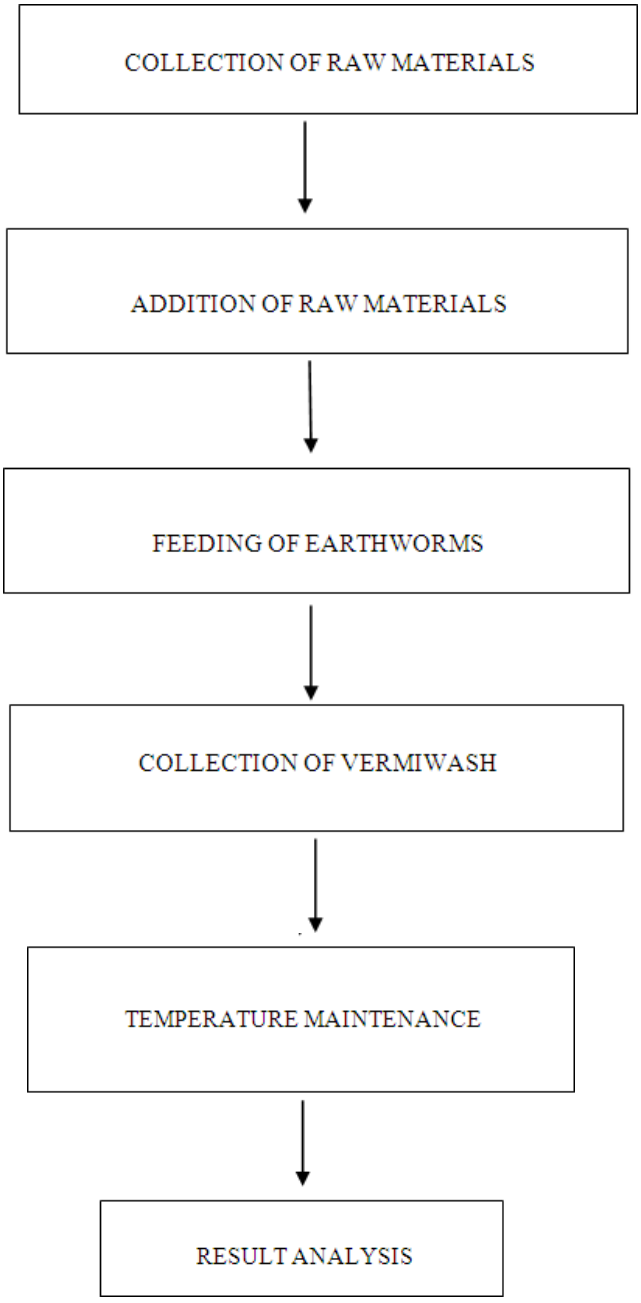
In the last few decades, there has been a tremendous increase in Municipal Solid Waste production in India. This is mainly due to the growth of population and economic growth in the country. In order to effectively manage the solid waste and to also produce organic manure which is capable of producing natural vegetation, vermicomposting methods can be used. The production of vermicompost helps in providing a healthier production of food. A growing number of individuals and institutions are taking interest in the production of compost utilizing earthworm activity. The beds are maintained at about 40 - 50% moisture content and a temperature of 20 - 30 by sprinkling water over the beds. The earthworms being voracious eaters consume the biodegradable matter and give out a part of the matter as excreta or vermi-castings. The vermi-cast containing nutrients, is a rich manure for the plants. When the commercial scale production is aimed at in addition to the cost of production, a considerable amount has to be invested initially on capital items. The high variability in the unit capital cost is due to the fact that large units require considerable expenditure on machinery and transport. However, in most of the cases, the activity is viable and bankable.

Principle of Vermicomposting

The process of vermicomposting is to raise the number of nutrients present in the soil. Compost has a property of allowing water to the plants that are growing. The choice of organism used here are earthworms as the consumer of the organic matter and castings are produced when they excrete. This process is mainly required to add nutrients to the soil. Vermicompost is the product of the decomposition process using various species of worms, usually red wigglers, white worms, and other earthworms, to create a mixture of decomposing vegetable or food waste, bedding materials, and vermicast. This process is called vermicomposting, while the rearing of worms for this purpose is called vermiculture. It is one

of the easiest methods to recycle vegetable waste and garden waste to produce quality compost; the earthworms consume biomass and excrete it in digested form called worm casts.

METHODOLOGY



COLLECTION OF RAW MATERIALS

The raw materials such as wastes were collected from the nearby shops and a dry leaf from our college campus, cowdung were collected for free from the local vendor and soil, gravel collected from our campus. The tender coconut shells were collected from nearby sellers.

ADDITION OF RAW MATERIALS

The raw materials that we collected are added in a step by step process. First the compostable sheet was laid in the ground to avoid water seepage and then a layer of gravel was placed for around one feet to filter vermiwash. Then tender coconut shells, vegetable waste, dry leaves, and food waste were added. Earthworms weighing 1Kg were added and was made sure no toxic waste was added and sprinkled water uniformly to maintain moisture content. Then cowdung, soil was put and sprinkled buttermilk. Vermiwash was collected.

FEEDING FOR EARTHWORMS

Earthworms are mainly fed up with the fed up with the decomposing organic matter found in the soil. They usually eat leaf, vegetable wastes that is available on the soil. They do not feed on any oil items, dairy products,salty foods, meat, bone and all. Helpful worm feeding tips The given food must be cut into smaller pieces. This cutting process decreases the feeding time of worms. Worms usually eat bacteria emerging on the food waste. Along with the bacteria it also takes very small portion of food. Food must be exposed to the external surface. Whenever food is exposed to the outer surface more, it will break down easily so the worms can easily eat their food. Avoid mixing the food, because mixing will make the food to release water so our vermicomposting will be too wet. Small pieces of food are healthier and better.

COLLECTION OF VERMIWASH

Vermiwash is the fluid extracted from the production of vermicompost in a medium where earthworms are richly populated. The macromolecules from the skin secretion of earthworm are directly able to defend pathogenic soil microbes against the worm and thereby freed the environment from the disease. To get vermiwash, continuously suspended water from the pit is collected at the bottom. Water is sprinkled regularly on the pit to maintain the temperature. After 7 to 10 days, the vermiwash was produced in the pit. After the production of compost, about 5-6 litres of vermiwash (shown in fig 2.4) was collected.

Fig 2.4- Collection of vermicompost

TEMPERATURE

The optimum temperature for earthworms is between 55-77 degrees. To remain active during winter, the system should be maintained at a temperature above 10°C. Surrounding soil temperature plays an important role in reproduction. Temperatures between 60 and 70 degrees Fahrenheit are more suitable for cocoon production and hatching. Worms can't live in temperatures below icy or above 95 degrees Fahrenheit. Worms consume and digest their food at temperatures greater than 77 degrees Fahrenheit. Growth and activity of earthworms mainly based on the temperature we maintain.

EXPERIMENTAL INVESTIGATION

3.1 PROCEEDINGS

- ✓ A tank with a dimension of 165cmx184cmx80cm is used.
- ✓ A compostable sheet is laid along the floor of the tank to avoid water seepage, as the ground was permeable.
- ✓ A layer of gravel was placed over the sheets in order to allow aeration and to filter vermiwash.
- ✓ A layer of tender coconut shells are placed over the gravel to prevent the escape of earthworms.
- ✓ Next a layer of vegetable wastes and food wastes (shown in fig A) are placed, taken from our college canteen.
- ✓ Then a layer of leaves are collected from our college garden.
- ✓ Earthworms weighing 1 kg were added (shown in fig B). It was made sure no toxic waste was added in order to produce good quality organic manure.
- ✓ Water was sprinkled uniformly to maintain the moisture content.

- ✓ A layer of cow dung & food waste was added as cow dung acts as the best source for the earthworm.
- ✓ Then a layer of soil is placed as a source of energy for microorganisms and water was sprinkled. Earthworms ingest soil, digest the organic matter present in it and excrete soil full of plant nutrients known as worm cast which makes soil fertile. They make burrows into the soil and thus they aerate the soil.
- ✓ Buttermilk was sprinkled (shown in fig C).
- ✓ After a period of two weeks there was rapid growth in the size of the earthworm(shown in fig D)
- ✓ Jaggery was sprinkled. Addition of jaggery accelerates the fermentation.
- ✓ Finally the pit was covered with jute bags and water was sprinkled to keep the worms cool.

Fig A -ADDITION OF LAYERS OF WASTE

Fig B–ADDITION OF EARTHWORM

Fig C- SPRINKLING OF BUTTERMILK

Fig D- RAPID GROWTH OF EARTHWORMS

QUANTITY OF MATERIALS USED

Item	Quantity in Kg
Coconut shell	3
Vegetable waste	6.5
Food waste	10
Cow dung	2
Soil	3.5
Earthworm	1
Buttermilk	2
Jaggery	1

OUTCOME

After a minimum of 90 days the colour of the compost started to change colour (shown in fig E) and the complete decomposition of the compost took about 100 days with ideal conditions. Once the compost is ready, the residue turns black in colour. On an average about 15 Kg of compost was obtained. After the completion of the composting process we have transferred the compost with earthworm to 30 buckets along with some raw materials to encourage home composting**.** Vermicompost stimulates the microbial activity of soil , increases the availability of oxygen , maintains soil temperature, increases soil porosity and infiltration of water, improves nutrient content and increases growth, yield and quality of plant.

Fig E-COLOUR CHANGE IN VERMICOMPOST

Fig F-Compost with earthworm and raw materials

BENEFITS OF VERMICOMPOST IN AGRICULTURE:

- Vermicompost contains an oversized number of plant nutrients which helps in growth and development of the plants and improves quality of the produce.
- Vermicompost contains variety of beneficial microorganisms which improves the soil
- fertility.
- Earthworms also contain vitamins, hormones and enzymes which help in balanced
- plant nutrition and plant growth.
- Vermicompost don’t have any offensive smell and don’t persist with hand for that
- it will be easily applied within the field.
- Vermicompost improves the physical and chemical properties of the soil and helps in improving the soil fertility on a sustainable basis.

CONCLUSION

Vermicomposting may be a process supporting earthworms and microorganisms, whose joint action provides degradation and detoxification of organic waste in addition as conversion into a product to be used for agronomic purposes. This eco-friendly method is cost effective and is the best among other remediation processes. Within the earthworm gut, enzymatic activities cause toxic metal immobilization, which suggests that vermitechnology is an efficient process for the remediation of heavy metals from industrial organic wastes/sludge. It are often concluded that vermiremediation potentially converts sugar industrial sludge to nutrient-rich organic manure for agricultural applications with reduced toxicity.

The assembly of degradable organic waste and its safe disposal becomes the present global problem. Meanwhile the rejuvenation of degraded soils by protecting topsoil and sustainability of productive soils is a major concern at the international level. Provision of a sustainable environment within the soil by amending with good quality organic soil additives enhances the water holding capacity and nutrient supplying capacity of soil and also the event of resistance in plants to pests and diseases.


Chennai, Tamil Nadu, India
ENGINEERING COLLEGE BLOCK, MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE,
Varadarajpet Rd, Subedar Colony, Kodambakkam, Chennai, Tamil Nadu 600024, India
Lat 13.055586°
Long 80.226228°
29/01/22 10:39 AM
Google


COMPOST
DRY LEAVES
COCONUT COIR


மீனாட்சி சுந்தரராஜன் பொறியியல் கல்லூரி
சமூக மேம்பாட்டிற்கான புத்தாக்கம் திட்டத்தொடக்
மாணவர்களின் அரிய நல்படைப்புக்களை பயனாளிகளுக்கு வழங்கி திட்டத்தினை துவக்கி வைப்பவ
தலைமை விருந்தினர்
மாண்புமிகு தமிழக முதலமைச்சர் உயர்திரு. மு.க.ஸ்டாலின் அவர்கள்
முன்னிலை

SOCIETAL BENEFICIAL INNOVATION PROJECT REPORT

WHEELCHAIR CANOPY

Department of Mechanical Engineering

&

Department of Electronics and Communication Engineering

—

Meenakshi Sundararajan Engineering College

—

M.Keerthivaasan
Eshwar.R
Yugendhiran.N
Madhumitha.G
Amreen Taj.M.A
Aishwarya.D.P

CONTENTS

S.No	Title	Pg. No.
1	INTRODUCTION	3
2	ABSTRACT	4
3	INITIATION OF THE PROJECT	5
4	DEVELOPMENT OF PROTOTYPE	6
5	CONCLUSION	22
6	FEEDBACK	23

INTRODUCTION

Wheelchairs have been prevalent in our society for a very long time and so does the problems people face when they use them. Among all the difficulties these people face, dealing with a sudden weather change would be one of the most frustrating things. Usually, people who use a wheelchair would have an assist to help them move and to hold an umbrella while moving them to a safe place during a rain. But not many users can afford an assist to be with them all the time and are forced to face the challenges alone. Umbrella holders have become the alternate option for using of umbrella, but the instability of the product during heavy winds makes it unreliable. All these factors suggest that an effective solution is required to solve these problems.

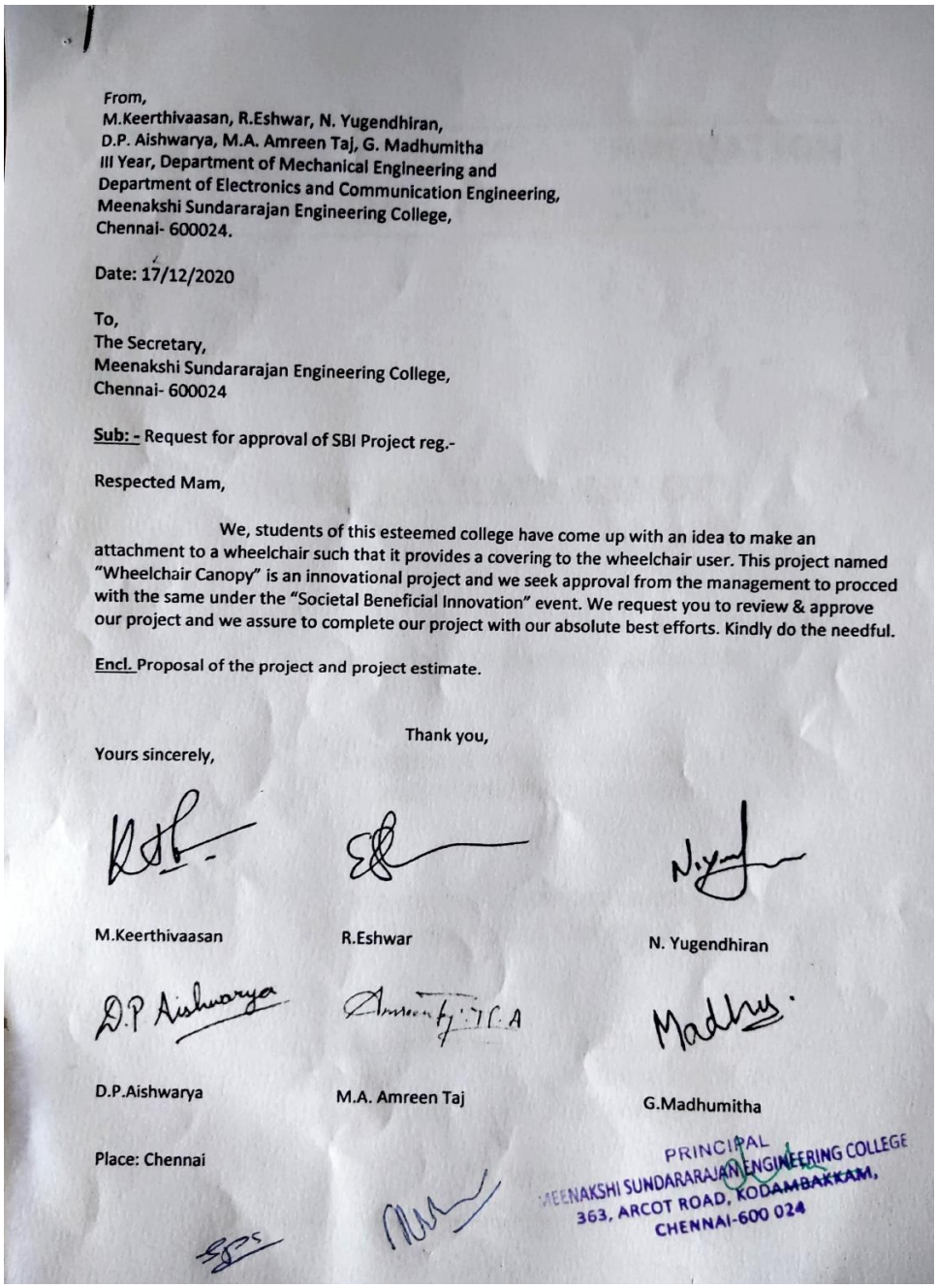
The existing umbrella requires manual operation to open and close, to overcome this difficulty, we have come up with our project which eliminates the need for assistance or manual holding of an umbrella. This project uses a motorized system for the umbrella to open and close on pressing the buttons provided. This gives complete control and comfort to the users. This project is much more cost effective than other solutions that are available in the common market.

ABSTRACT

Wheelchair (Manual/Electric) is an essential part in the life of the physically challenged people, the patients and the elderly. While commuting in a wheelchair, holding an umbrella can be very inconvenient. To overcome this inconvenience, a prototype of "wheelchair canopy" is designed. In this prototype, push buttons are equipped to operate the canopy. These push buttons are placed in such a way that the person can operate conveniently and use them as and when required. Well-constructed mechanical ribs provide adequate support for the canopy and are designed to give maximum coverage from rain and sunlight. It also provides ample stability to withstand heavy winds. The canopy has also been made adjustable and detachable so that it is easier to fit in wheelchairs of all sizes and can be removed in days it is not necessary. Installation/Uninstallation of the canopy is made really simple for easier usage. The aim of the project is to make this an easy-to-use product for wheelchair users. All these features make this wheelchair canopy a safe and beneficial product and replaces the manual umbrella for physically challenged people.

INITIATION OF PROJECT

After several brainstorming sessions by both Department of Mechanical Engineering and Department of Electronics and Communication Engineering, a concept for a new attachment for a wheelchair was formed and this idea was taken forward to the Secretary of the College to approve it under the Societal Beneficial Innovation (SBI) project.



From,
M.Keerthivaasan, R.Eshwar, N. Yugendhiran,
D.P. Aishwarya, M.A. Amreen Taj, G. Madhumitha
III Year, Department of Mechanical Engineering and
Department of Electronics and Communication Engineering,
Meenakshi Sundararajan Engineering College,
Chennai- 600024.

Date: 17/12/2020

To,
The Secretary,
Meenakshi Sundararajan Engineering College,
Chennai- 600024

Sub: - Request for approval of SBI Project reg.-

Respected Mam,

We, students of this esteemed college have come up with an idea to make an attachment to a wheelchair such that it provides a covering to the wheelchair user. This project named "Wheelchair Canopy" is an innovational project and we seek approval from the management to procced with the same under the "Societal Beneficial Innovation" event. We request you to review & approve our project and we assure to complete our project with our absolute best efforts. Kindly do the needful.

Encl. Proposal of the project and project estimate.

Thank you,

Yours sincerely,

M.Keerthivaasan R.Eshwar N. Yugendhiran

D.P.Aishwarya M.A. Amreen Taj G.Madhumitha

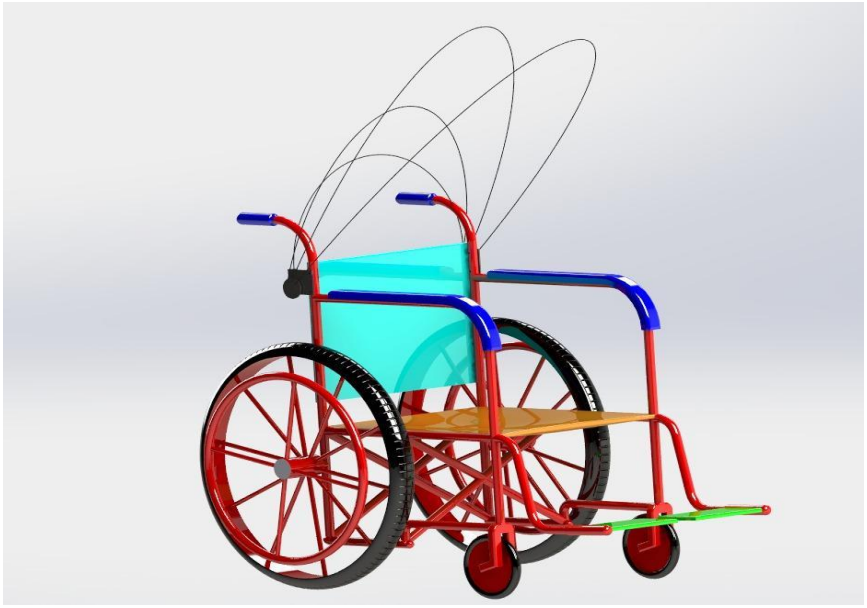
Place: Chennai

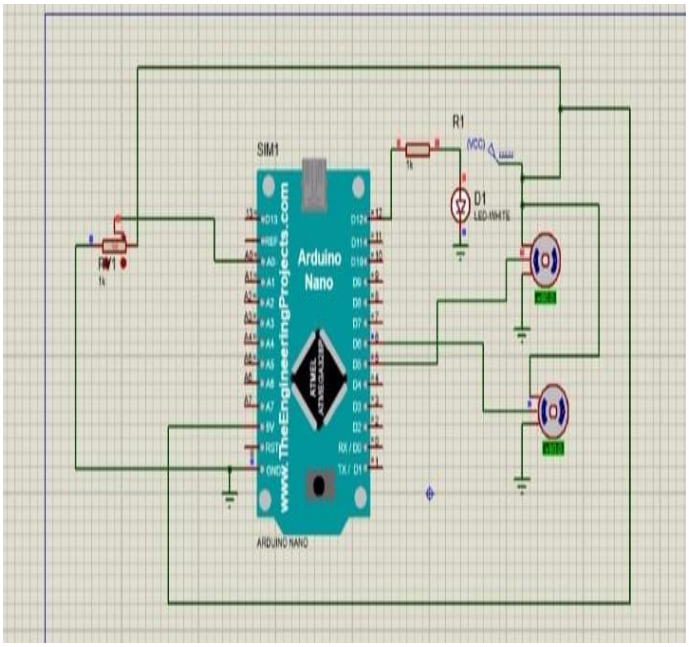
PRINCIPAL
MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM,
CHENNAI-600 024

DEVELOPMENT OF PROTOTYPE

PROTOTYPE I

After the approval of the project, creation of the first prototype design was initiated and was completed with several iterations. The design was then verified with the help of faculties' in-charge and fabrication of the same was started.



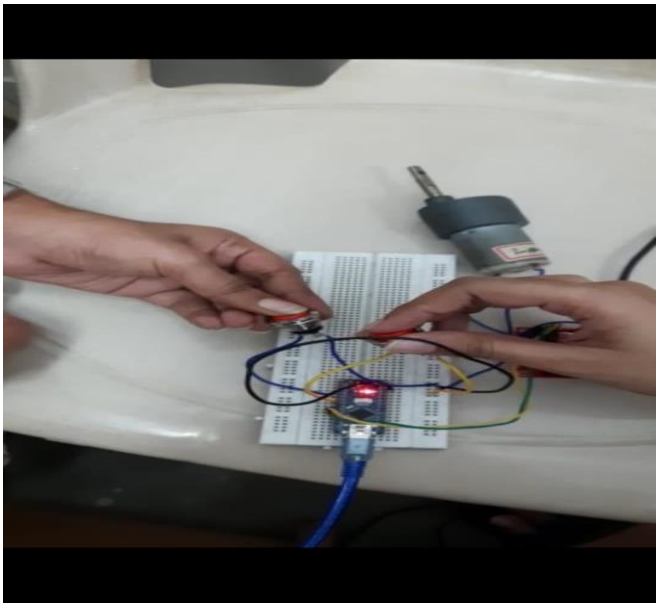


This (fig.1.1) was the first simulation model we started off with, it included an Arduino Nano, two servo motors, a resistor of 1k ohm and a potentiometer to vary the speed of the motors and was simulated using Proteus software. It worked well and we further carried onto a hardware model.

Limitation:

In the hardware model, the servo motor lacked the necessary torque required to lift the mechanical load therefore we had to change the circuit design by replacing the servo motors with DC motor.

Fig.1.1

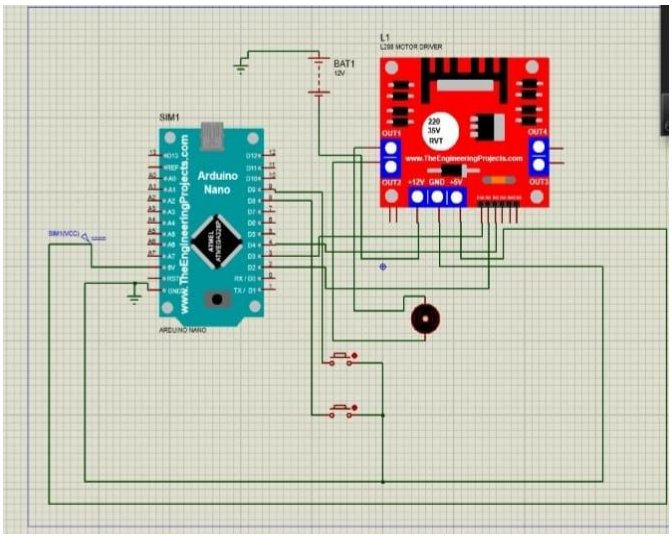


In the hardware model(fig.1.2), we made use of one DC motor as it had required specification needed to lift the mechanical load, further we also included two push buttons for adjusting the motors movement in forward and backward directions.

Limitation:

Arduino could not transfer enough power to the DC motor thence it could not carry the load.

Fig.1.2



In our upgraded design (fig1.3), in order to provide the motor with sufficient power, we added a motor driver module L298N, as suggested by our mentor. This simulation model functioned well, consequently we decided to advance to a hardware model.

Fig1.3

In due course, we figured out that the same working can be achieved without the use of Arduino. Also in order to reduce the estimated cost of the overall project we decided to remove the Arduino and replace it with direct power supply. As the movement of the canopy needs to be stopped at the certain position in both the directions for this to be done, after researching about it along with our mentor, we came up with the idea of using limit switches to restrict the canopy movements at both ends.

COST ESTIMATION OF THE FIRST PROTOTYPE:

Component	Price (in Rs)
Arduino Nano	550
Driver Motor	300
DC Motor	550
9V Battery	30
Jumper Wires	90
Gear, shaft, disc, wire frame	1000
Push Button	40
Cover material	50/meter
Approximate Cost	**2500**

FABRICATED MODEL:

The model was successfully made and presented on 11.10.2021 to the Secretary and the faculty members and several improvements were suggested. These suggestions were noted and were executed in the next prototype.

REVISION I

In this prototype, the design was reconsidered and designed to increase the overall height of the product. The covering material was changed to a transparent material to facilitate better visibility of the surroundings. With a similar cost estimation, the fabrication was done and presented to the management.

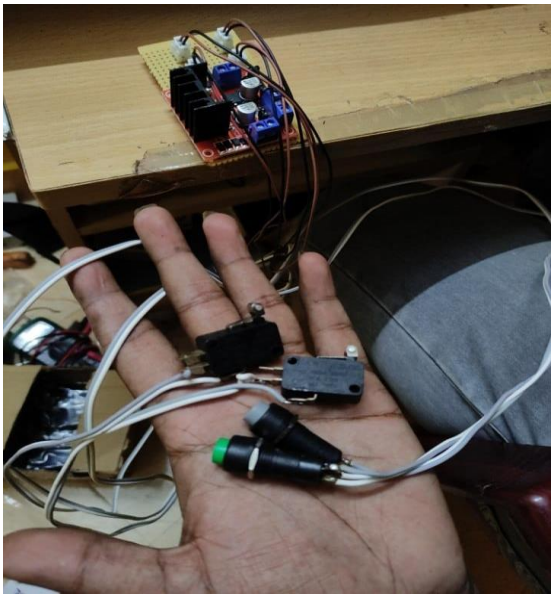


Fig.1.4

The model without using Arduino and by including limit switches (fig.1.4) was developed and executed successfully.

Limitation:

The dc motor didn't have enough torque to lift the mechanical load. So, as suggested by our professors we decided to use stepper motor.

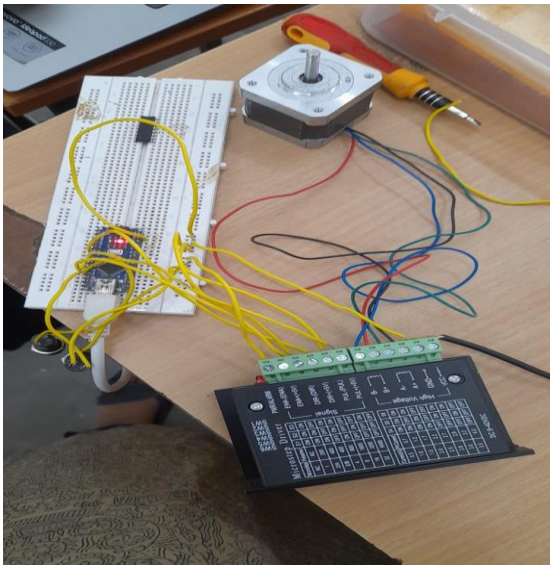


Fig.1.5

After buying the stepper motor and a driver module (TB6600) for it, connections were given as shown in fig.1.5 and after several trials and errors, we got our desired output.

Limitation:

We tested it with mechanical model and unfortunately the stepper motor was unable to lift the load.

REVISION - II

In this revision, the overall weight of the model was planned to be reduced. This was done by making use of aluminum tubes in the palace of mild steel rods for the frame. Although this increased the cost of production, this greatly reduced the weight of the product, thereby reducing the torque requirement of the motor. The model was also modified to be easily attached and detached from the wheelchair by making use of a joint attached to the armrest of the wheelchair. Since the transparent material was not strong enough to withstand impact of rain and wind, a combination of transparent material and PVC Polyester.

After lot of discussions and research, our professors suggested to use wiper motor as it has enough torque to lift the load and so we decided to give it a shot.

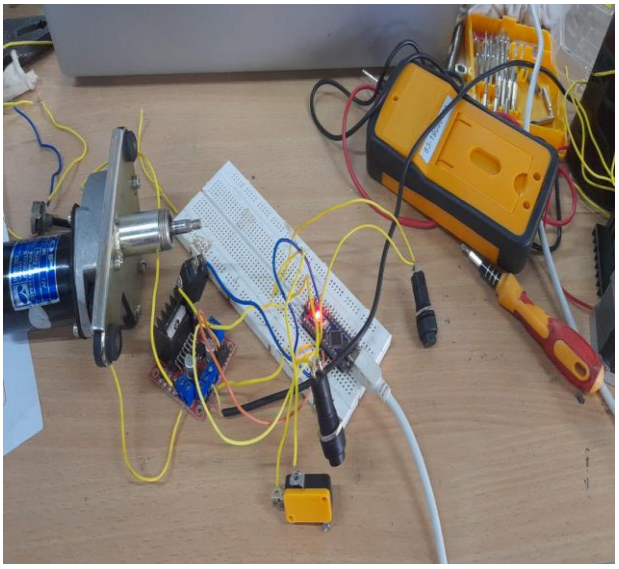


Fig1.6 Circuit developed using Arduino and wiper motor

Fig.1.7 Circuit developed without arduino and with wiper motor

Fig.1.8 wiper motor worked successfully

Fig.1.9 wiper motor successfully lifting the load

Hence, we finally achieved the output as shown in Fig.1.8 and 1.9 by using wiper motor.

COST ESTIMATION OF THE REVISION MODEL:

SBI Project: Wheelchair Canopy Bill of Materials					
ITEM NO.	**PART NAME**	**SPECIFICATION**	**MATERIAL**	**QTY**	**COST**
1	Canopy	Covering(1.5m)	PVC Polyester	1	850
2	Moving Frame	2.6m pipe (9mm dia)	Aluminum	1	150
3	Fixed Frame	2.5m rod (8mm dia)	Mild Steel	1	200
4	Base Mount Plates	4mm thick plates	Mild Steel	2	150
5	Base Rod	.6m rod (8mm dia)	Mild Steel	1	100
6	Motor Mount Plates	4mm thick plates	Mild Steel	4	200
7	Mounting Joint	20mm dia elbow	Stainless Steel	2	100
8	Bush	12mm,20mm dia	Mild Steel	4	300
9	Bearing	6001	Chrome Steel	2	180
10	Cotter Pin	Standard Pin	Stainless Steel	2	10
11	Lock Pin	.1m threaded rod (8mm dia)	Mild Steel	2	50
12	Thin Plate	3mm thickness plate	Mild Steel	2	20
13	Bolts	M5,M6,M8	Stainless Steel	8	50
14	Nuts	M5,M6,M8	Stainless Steel	12	70
15	L298N driver module	Voltage:5-35V, Current:2A, Max.Power:25W	-	1	200
16	Wires and jumpers	-	-	as required	250
17	Limit switch	SPDT	-	2	100
18	Push button	-	-	2	80
19	Wiper motor	12v,1.5A	-	1	1000
20	PCB	-	-	1	700
21	Casing	3d printing	-	1	2000
22	Dpdt switch	-	-	1	20
23	Rechargeable battery	12V,2A	-	1	700
24	Resistor	330 ohm	-	2	30
				TOTAL	**7510**

REVISION- III

The model was further improved by replacing PVC Polyester with a lighter and more flexible nylon-66. To safeguard the motor and the circuit, they were placed inside the casing and mounted on the wheelchair. The sides of the covering was further improved by making use of a window-like openings for transparent material. The overall look of the model was also improved.

PROTOTYPE MODEL:

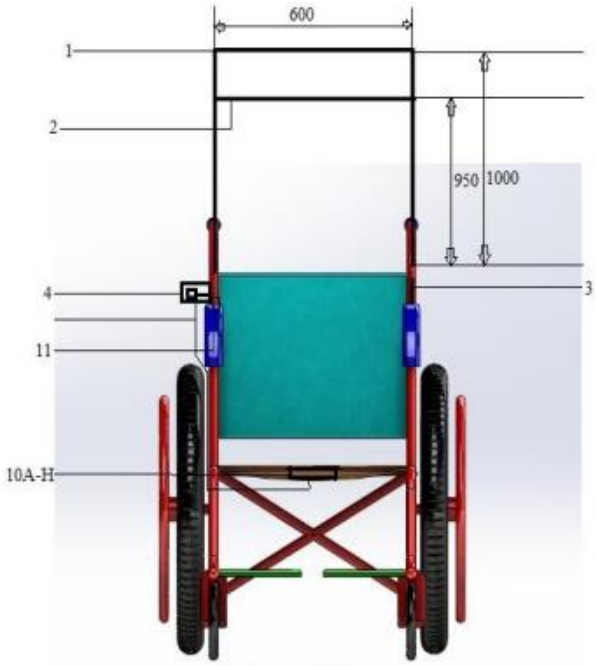


Fig 1 - Wheel chair Canopy
(FRONT VIEW)
ALL DIMENSIONS ARE IN mm

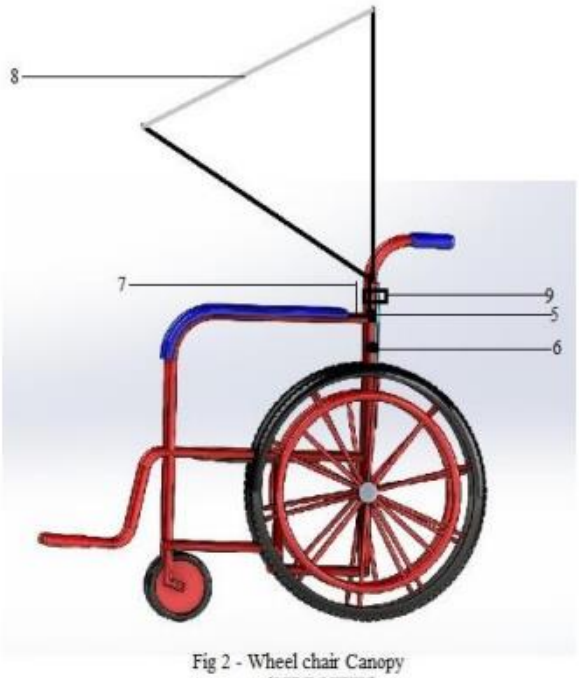
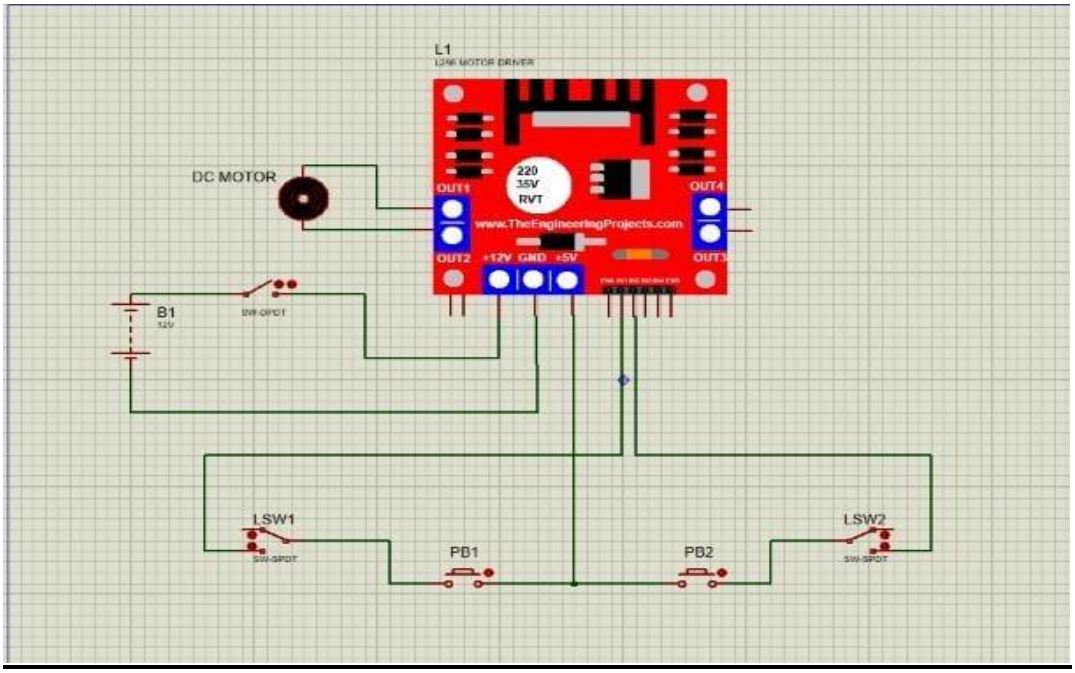


Fig 2 - Wheel chair Canopy
(SIDE VIEW)



This model was fabricated and presented to the management. This revision was accepted as the final model and the final production was initiated.

20 nos. of this model were developed.

FABRICATED MODEL:

COST ESTIMATION OF THE MODEL:

SBI Project: Wheelchair Canopy								
Bill of Materials with Cost Estimation								
S. NO.	**ITEM NO. As shown in fig.1&2**	**COMPONENT**	**SPECIFICATION**	**QTY**		**UNIT COST**		**COST**
				KG	**PC**	**RATE/ KG**	**LUMPSUM**	
1	1	Fixed Frame (Mild Steel) - It is used to give the rigidity required for the umbrella.	Length: 1m (ϕ 8mm)	3	-	80	-	240
2	2	Moving Frame (Mild Steel) - We are using aluminum instead of mild steel as we are trying to reduce the load as much as possible.	Length: 2.6m (OD-ϕ 7mm, ID-ϕ 3mm)	1	-	100	-	100
3	3	Base Mount Plates(Mild Steel) - It is used to provide a rigid base structure for the umbrella's stability	Length: .152m, Breadth: .081m, Thickness: 10mm	1.9	-	100	-	190
4	4	Motor Support Sleeve	Length: .045m (OD-ϕ 18mm, ID-ϕ 6 mm)	0.12	-	100	-	12
5	5	Washer	M6,M10		10			50
6	6	Central Shaft(Mild Steel) - It is equipped to transmit the motor drive to the other direction, thereby having synchronous motion.	Length: 0.6m rod (ϕ 12mm)	0.45	-	60	-	50
7	7	Mounting Plate(Stainless Steel) - It acts as the connection between the wheelchair and canopy.	Length: .05m, Breadth: .152m, Thickness: 10mm	1.2		100		120
8	8	Canopy - It is common in the places where coverings are needed. It is highly durable and can withstand heavy	Length: 1m,Thickness: 0.5mm	-	2	470	-	940

		rainfall and winds.						
9	9	Wiper motor - It is used, as it provides high torque to withstand the moving frame	12V,1.5A		1	-	1000	1000
10	10A	L298N driver module - The driver module is used for driving the motor and to control the direction of rotation by changing its polarity.	Voltage:5-35V, Current:2A, Max.Power:25W	-	1	-	200	200
11	10B	Wires and jumpers - Used for circuit connections	-	-	as required	-	100	100
12	10C	Limit switch - It is used so as to limit the distance of the moving frame in forward and backward direction.	SPDT	-	2	-	50	100
13	10D	General PCB - Main control system of the canopy	-	-	1	-	2000	800
14	10E	Casing - Covering for the PCB	3d Printing	-	1	-	1000	700
15	10F	Rechargeable battery - It is used to supply voltage to the circuit for long time run and constant discharge of voltage.	12V,2A	-	1	-	1850	1500
16	10H	DPDT switch - The switch is used to switch on and off the circuit.	-	-	1	-	20	20
17	11	Push button - Push buttons for forward and backward direction are used, to electronically control the circuit and to send control signals to the motor for the movement of the canopy.	-	-	2	-	40	80
18	-	Bush(Mild Steel) - It is installed to properly secure the motor shaft and central shaft for proper transmission of motor drive.	ID:13mm ϕ,OD:32mm ϕ, Length:.02m	0.12	2	100	-	12

19	-	Bearing - This best suits our required dimensions and is used for free flow of motor drive.	6001, Ball Bearing	-	2	-	90	180
20	-	Thin Plate (Mild Steel)- Used for connecting horizontal and vertical rods of the fixed frame	Length: 0.02m, Breadth: 0.01m,Thickness: 3mm	-	2	-	20	40
21	-	Bolts (Stainless Steel) - It used for making the canopy be adjusted in size and for easier uninstallation, as welding them would make it a permanent joint.	M5,M6,M8,M10	-	8	-	6	200
22	-	Nuts (Stainless Steel) - It used for making the canopy be adjusted in size and for easier uninstallation, as welding them would make it a permanent joint.	M5,M6,M8,M10	-	12	-	6	
23		Adapter			1		750	750
24		4-Way Connecter					170	170
25		12V, 1 Channel Relay						400
26		Heat Shrink						400
27		Paint and Stickers						3500
28		Miscellaneous Cost(Tools)						7000
TOTAL Material Cost								**18,854**
Total Cost without Wheelchair								**18,854**
Total Cost for 20 models								**3,77,080**

CONCLUSION

Twenty nos. of the product were fabricated and tested for usability and comfort. These products were then fitted into the wheelchairs sponsored by KONE Elevators, Chennai. An event for Societal Beneficial Innovation was organized on 26.02.2022 to distribute the wheelchairs to the differently-abled by the Hon. Chief Guest, Thiru M.K. Stalin, Chief Minister of Tamil Nadu.

FEEDBACK

Feedback for SBI Project- Wheelchair Canopy				
S.No	**Photo**	**Name**	**Feedback**	**Contact No.**
1		Jothi	The wheelchair which was provided to me was really useful and it was very sturdy. Usually, I used to hold an umbrella when the rain comes. But I found it very uncomfortable to use it and move the wheelchair. Now, I have no need to worry. Thank you.	7418722393
2		Tamil Selvan	Thanks to Meenakshi Sundararajan Engineering College, now I am able to move around in my wheelchair without any problem and I have no need to depend on anyone for assistance during rainy time or sunny time.	9600005583
3		Kaleeswaran	This wheelchair is really a great thing I have received. I had great time using it and I would definitely recommend them to make more such things. Although, I found charging the canopy to be slightly inconvenient, and I suggest them to make some alternate option to charge it. It was a great effort by Meenakshi Sundararajan Engineering College and I'm extremely thankful for it.	9094536906
4		Annanda Raj	Thank you for giving me this wonderful invention and making my life special. I was finally able to go out during rain without any worries and experience it.	7395912314
5		Elanchezhian N P	The covering provided along with the wheelchair was really useful. It was strong enough even during wind times. If I may suggest, I would recommend them to be having more features like lights or indicators, chargers, etc. Thank you.	6374864853

6		Kamatchi	It was a great innovation. The canopy was too good in such a way that the needful people can use it in a regular base. They can now go from place to place even it is raining or during hot seasons. The best part is that it is just a button for them for their roof which protects them, the easy use and affordability place a major role for this project. I wish the team a great success.	7448750985
7		Rajendran	The wheelchair provided with the attachment was really handy for me during rainy season. depend on someone to hold an umbrella to go outside while its raining, but with the help attachment, I can go outside in the rain without anyone's help. I liked it very much. Thank you.	9841150178
8		Saleem	Very good wheelchair. Very comfortable and the covering worked just as they said. The demo that was done really made it easy for me to use it. Thank you.	9003254685
9		Karthikeyan	Thank you so much for the donation. Earlier, I wouldn't get to use my wheelchair during rainy times, but after getting this, it is easy for me to move around during those conditions.	8925295045
10		Ruban	Thanks to everyone on the team for making us this! It was really handy and helped me a lot.	6382206548
11		Selvam	Great initiative by Meenakshi Sundararajan College to help needy people with helpful innovations. I was happy to receive this product and it was very good and useful.	9884448975
12		Gajendran D	This wheelchair helped me a lot during emergency times when I had to face sudden rain. The cover provided on top was really useful and kept me safe from getting wet in the rain. I thank everyone who gave this to me.	9962195648

13		Nagadas	This wheelchair unit was really good and helped me several times during hot afternoons and also during rain time. On lighter days, I was able to remove the attachment provided with the wheelchair which let me use it whenever I needed it and that was a really nice thing to have. Thanks a lot to everyone who helped me for this.	7871875484
14		Susila	Great thinking by the team by making this product. It was very useful and I want to thank everyone for helping me.	7092294541
15		Balamurugan	I was having a wheelchair already but I could not use that all the time. After I got this wheelchair, I was able to go out at any time, without worries. Thanks to everyone who worked on it and helped me!	9840978880

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

PROJECT – SUN CLAVE

SMART BIN WITH UV INTERFACED

The SUN CLAVE bin was developed in the notion of breaking the chain of infection spread, especially in the COVID-19 season. Our product stands alone from the conventional bin, wherein only medical waste is to be disposed and thus it will be sterilized subsequently. This is a primitive idea that aims at benefitting the people who are at more risk of contacting many diseases. This initiative would serve as an awareness to everyone on how to safely dispose medical waste without causing harm to the environment.

TEAM

H. Nithyasree

III ECE - B

G. Ramya Rajani

III ECE - B

K. Vijay

III ECE - B

B. Akshitha

III ECE - A

S. Sruthi

III ECE - B

S. Sneka

III ECE - B

R. Sneha Priya

III ECE - B

पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
OF
THE PATENT OFFICE

निर्गमन सं. 24/2022	शुक्रवार	दिनांकः 17/06/2022
ISSUE NO. 24/2022	FRIDAY	DATE: 17/06/2022

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :19/05/2022

(21) Application No.202241028898 A
(43) Publication Date : 17/06/2022

(54) Title of the invention : Smart Bin with UV Interface (Sun Clave)

(51) International classification	:A61M0005320000, A61L0011000000, C07K0014705000, C05G0003000000, A61L0002100000
(86) International Application No Filing Date	:PCT// :01/01/1900
(87) International Publication No	: NA
(61) Patent of Addition to Application Number Filing Date	:NA :NA
(62) Divisional to Application Number Filing Date	:NA :NA

(71)**Name of Applicant :**
1)BABAI K S
Address of Applicant :363, Arcot Road, Kodambakkam, Chennai -24 ----------
2)Mrs. Siji Sivanandan
3)Mr. S. Balasubramanian
4)Ms. B. Akshitha
5)Ms. H. Nithyasree
6)Ms. G. Ramya Rajani
7)Ms. R. Sneha Priya
8)Ms. S. Sneka
9)Ms. S. Sruthi
10)Mr. K. Vijay
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)BABAI K S
Address of Applicant :363, Arcot Road, Kodambakkam, Chennai -24 ----------
2)Mrs. Siji Sivanandan
Address of Applicant :Associate Professor, Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------
3)Mr. S. Balasubramanian
Address of Applicant :Associate Professor, Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------
4)Ms. B. Akshitha
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------
5)Ms. H. Nithyasree
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------
6)Ms. G. Ramya Rajani
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------
7)Ms. R. Sneha Priya
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------
8)Ms. S. Sneka
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------
9)Ms. S. Sruthi
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------
10)Mr. K. Vijay
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024 ----------

(57) Abstract :
SMART BIN WITH UV INTERFACE(SUN CLAVE) The idea of SMART BIN WITH UV INTERFACE was developed in the notion of breaking the chain of infection spread. The main motive of this innovation is to provide a contactless bin that would sterilize the medical wastes like masks, cotton, syringe, etc., thereby replacing the traditional trash bin. This bin provides a safer disposal of medical wastes and it reduces the risk of spreading diseases, due to the disposed waste. The invention uses UV rays of type C to sterilize the medical wastes. This kills and prevents the further growth of pathogens present in the medical wastes, without causing harm to the environment.

No. of Pages : 19 No. of Claims : 10

AUTOMATED BIN WITH UV INTERFACED

ABSTRACT

This COVID pandemic has taught us the core survival instincts & foresee technological need balance. The Used face masks are hazardous waste and must be discarded immediately upon removal. Instead of throwing used masks into the disposal bin, disinfecting the masks is essential to break the chain of infection spread. The development of this device was attempted for COVID-19 management. There are millions of public dustbins out there that people use for throwing used mask and are emptied by the public authorities. Now the problem is that, when the public authority disposes the mask, they may be infected by the pathogens present in the mask. Automated bin interfaced with UV can solve this issue by sterilizing the used mask using the UV rays. So, the pathogens present in the mask can be eliminated and once these smart bins are implemented on a large scale, by replacing our traditional bins present today, it highly reduces the risk of spreading diseases.

புற ஊதா இடைமுகத்துடன் தானியங்கி தொட்டி

சுருக்கம்

இந்த கோவிட் தொற்றுநோய், தொழில்நுட்பத் தேவை சமநிலையை முன்னறிவிக்கும் முக்கிய உயிர்வாழ்தல் உள்ளுணர்வுகளை நமக்குக் கற்றுக்கொடுத்துள்ளது. பயன்படுத்தப்பட்ட முகமூடிகள் அபாயகரமான கழிவுகளாகும், மேலும் அகற்றப்பட்டவுடன் உடனடியாக நிராகரிக்கப்பட வேண்டும். பயன்படுத்திய முகமூடிகளை அகற்றும் தொட்டியில் வீசுவதற்குப் பதிலாக, தொற்று பரவலின் சங்கிலியை உடைக்க முகமூடிகளை கிருமிநீக்கம் செய்வது அவசியம். இந்த சாதனத்தின் வளர்ச்சி கோவிட்-19 மேலாண்மைக்கு முயற்சிக்கப்பட்டது. இந்த உலகில் மில்லியன் கணக்கான பொது குப்பைத் தொட்டி உள்ளது, அவை மக்கள் பயன்படுத்திய முகமூடியை வீசுவதற்கு பயன்படுத்தப்படுகின்றன மற்றும் பொது அதிகாரிகளால் காலி செய்யப்படுகின்றன. இப்போது பிரச்சனை என்னவென்றால், பொது அதிகாரம் முகமூடியை அகற்றும்போது, முகமூடியில் உள்ள நோய்க்கிருமிகளால் அவை பாதிக்கப்படலாம். தானியங்கி தொட்டி புற ஊதா கதிர்கள் பயன்படுத்தி கிருமிகளை அழித்தல் மூலம் இந்த பிரச்சினை தீர்க்க முடியும். எனவே, முகமூடியில் உள்ள நோய்க்கிருமிகளை அகற்றலாம் மற்றும் இந்த ஸ்மார்ட் தொட்டிகள் பெரிய அளவில் செயல்படுத்தப்பட்டவுடன், இன்று இருக்கும் நமது பாரம்பரிய தொட்டிகளை மாற்றுவதன் மூலம், இது நோய்கள் பரவும் அபாயத்தை மிகவும் குறைக்கிறது.

REPORT

64216120131066

SC CLOTH 0-MIN

PID NO: P642100756766
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131066
Registered On:
29/12/2021 10:47 AM
Collected On:
29/12/2021 10:47AM
Reported On:
31/12/2021 03:58 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SC CLOTH 0-MIN	No growth

Comments : Satisfactory.

-- End of Report --

Consultant Microbiologist
MBBS MD Microbiologist

Dr. KAVITA V
MD, DIP NB

Dr. Lakshmi Priya

REPORT

64216120131069

SC CLOTH 20-MIN

PID NO: P642100756769
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131069
Registered On:
29/12/2021 10:49 AM
Collected On:
29/12/2021 10:49AM
Reported On:
31/12/2021 03:58 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SC CLOTH 20-MIN	*Aerobic spore formers

Comments :* Need disinfection

-- End of Report --

Consultant Microbiologist
MBBS MD Microbiologist

Dr. KAVITA V
MD, DIP NB

Dr. Lakshmi Priya

64216120131070

SC CLOTH 40-MIN

PID NO: P642100756774
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131070
Registered On:
29/12/2021 10:50 AM
Collected On:
29/12/2021 10:50AM
Reported On:
31/12/2021 03:39 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SC CLOTH 40-MIN	*Aerobic spore formers

Comments :* Need disinfection

-- End of Report --

Dr.B.R. PRAKASH RAO MD
Consultant Microbiologist

Dr. KAVITA V
MD, DIP NB

Prakash.Rao

REPORT

64216120131072

SC CLOTH 60-MIN

PID NO: P642100756777
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131072
Registered On:
29/12/2021 10:51 AM
Collected On:
29/12/2021 10:51AM
Reported On:
31/12/2021 03:38 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SC CLOTH 60-MIN	No growth

Comments : Satisfactory.

-- End of Report --

Dr.B.R. PRAKASH RAO MD
Consultant Microbiologist

Dr. KAVITA V
MD, DIP NB

Prakash.Rao

REPORT

64216120131073

SC MASK 0-MIN

PID NO: P642100756781

Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131073

Registered On:
29/12/2021 10:52 AM

Collected On:
29/12/2021 10:52AM

Reported On:
31/12/2021 03:57 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SC MASK 0-MIN	*Aerobic spore formers

Comments : * Need disinfection

-- End of Report --

Consultant Microbiologist
MBBS MD Microbiologist

Dr. KAVITA V
MD, DIP NB

Dr. Lakshmi Priya

REPORT

64216120131075

SC MASK 20-MIN

PID NO: P642100756783

Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131075

Registered On:
29/12/2021 10:53 AM

Collected On:
29/12/2021 10:53AM

Reported On:
31/12/2021 03:40 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SC MASK 20-MIN	*Aerobic spore formers

Comments :* Need disinfection

-- End of Report --

Dr.B.R. PRAKASH RAO MD
Consultant Microbiologist

Dr. KAVITA V
MD, DIP NB

Prakash.Rao

REPORT

64216120131086

SC MASK 40-MIN

PID NO: P642100756812

Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131086

Registered On:
29/12/2021 11:14 AM

Collected On:
29/12/2021 11:14AM

Reported On:
31/12/2021 03:38 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SC MASK 40-MIN	No growth

Comments : Satisfactory.

-- End of Report --

Dr.B.R. PRAKASH RAO MD
Consultant Microbiologist

Dr. KAVITA V
MD, DIP NB

Prakash.Rao

REPORT

64216120131088

SC MASK 60-MIN

PID NO: P642100756816
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131088
Registered On:
29/12/2021 11:15 AM
Collected On:
29/12/2021 11:15AM
Reported On:
31/12/2021 03:38 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SC MASK 60-MIN	No growth

Comments : Satisfactory.

-- End of Report --

Dr.B.R. PRAKASH RAO MD
Consultant Microbiologist

Dr. KAVITA V
MD, DIP NB

Prakash.Rao

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SOCIETAL BENEFICIAL INNOVATION

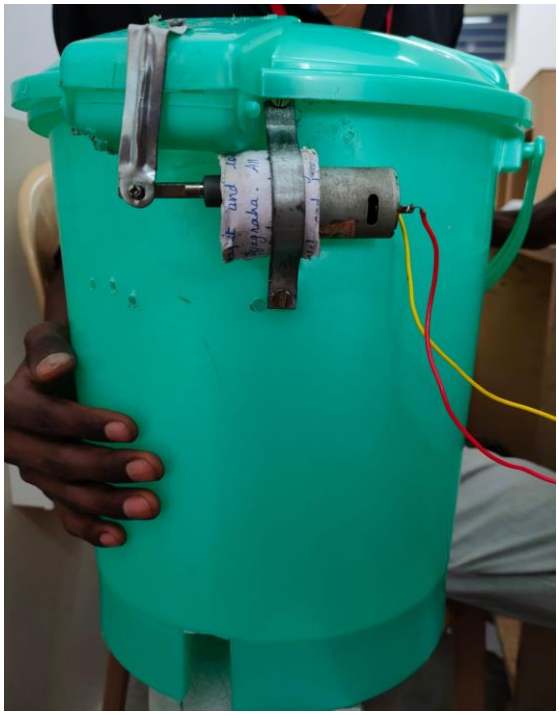
SUN CLAVE

(SMART BIN WITH UV INTERFACE)

COST ESTIMATION

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE				
SOCIETAL BENEFICIAL INNOVATION				
SUN CLAVE - SMART BIN				
S.No	**Description**	**Quantity**	**Amount**	**Amount per Bin**
1	UV LED	5	13904	2780
2	Electronic Components	5	37400	7480
3	Casing	5	19732	3946
4	PCB	5	7130	1426
5	Testing	5	4500	900
	Amount with casing and testing	5	82666	16533
	Amount without casing and testing	5	78166	15633
	Amount without testing	5	58434	11686

PROJECT PHASE I



The DC motor was used to open the lid. The clamp was used to hold the motor. But due to the vibrations from the DC motor, the clamp was not able to hold the motor. The clamp attached with the lid of the bin could not maintain its rigidity and this design was also not up-to the mark and user friendly.

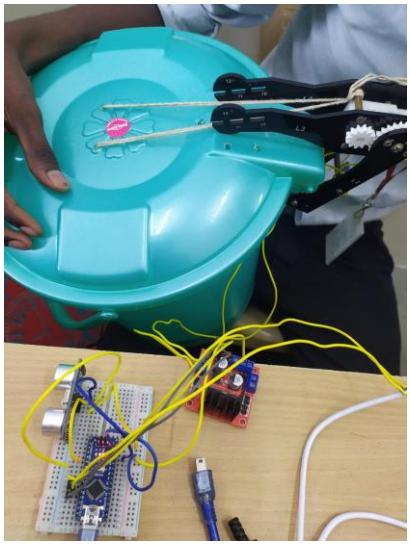
PROJECT PHASE II

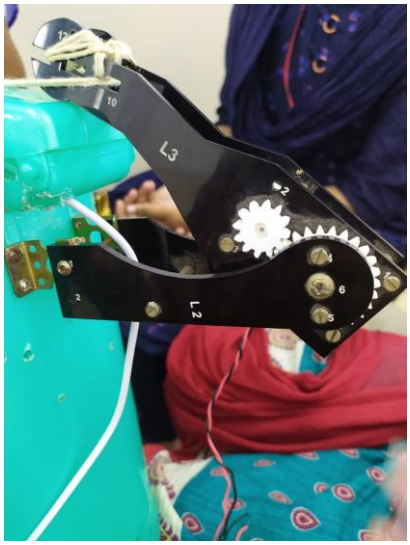
The second project phase was based on using BO (Battery Operated) motor to open the lid, the motor was placed at the back side of the bin but this arrangement does not meet our requirements. So we decided to proceed with a combination of stick and motor to open the bin.

In this arrangement, a stick was placed on top of the lid. And a motor was placed at the bottom of the stick for movement. The motor used was BO motor. Then the arrangement worked.

Further it was proceeded with our development by placing the UV strips. The UV strips were placed below the lid for sterilization. But due to the combined weight of lid and the UV strip, the BO motor was not efficient enough to open the lid.

PROJECT PHASE III

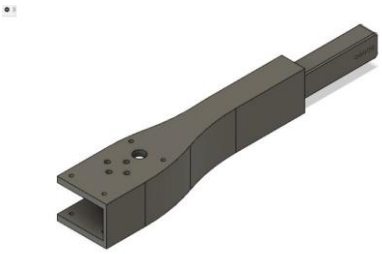


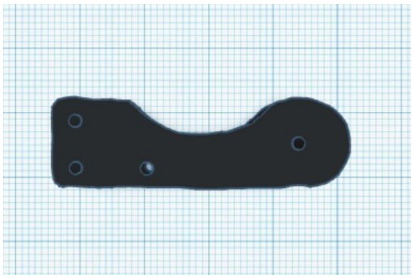


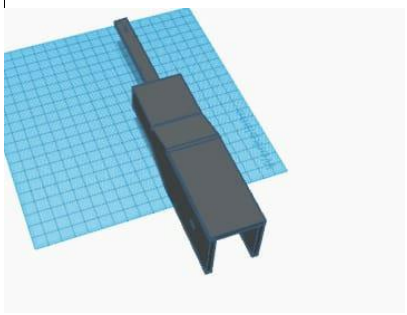
The third project phase was based on a combination of arm and motor to open the lid, but this arrangement does not meet our requirements. So it was decided to proceed by using robotic arm embedded with motor along with the thread to open the bin.

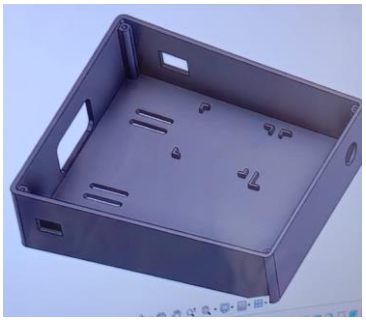
In this setup, the robotic arm was attached at the backside of the bin, but this arrangement did not open the lid fully. So a thread was tied at a desired angle from the lid to the robotic arm. Due to the weak tensile strength of the thread, the robotic arm was not able to open the bin fully.

DESIGN PHASE I



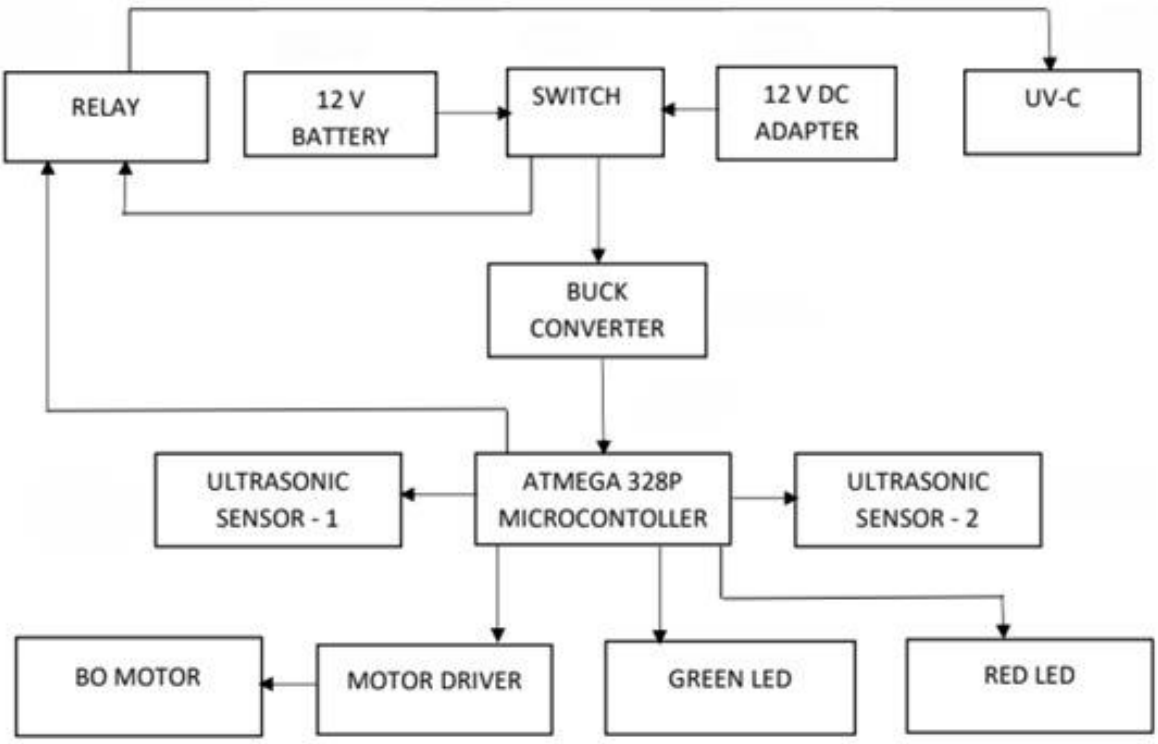




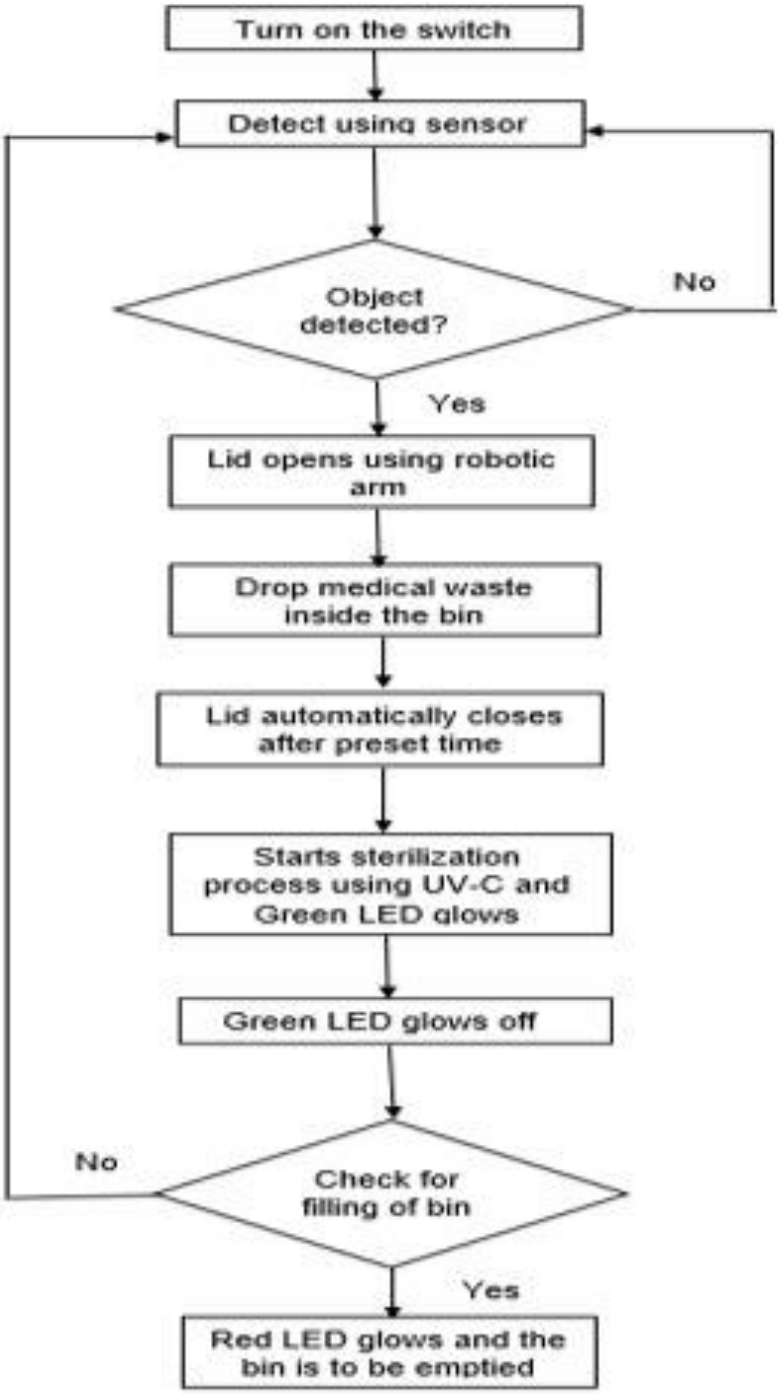


Firstly, the robotic arm and circuit box was designed using a software platform called TINKERCAD. The design was modelled through 3d printing . The circuit box was attached on the bin to cover the circuits. The robotic arm was attached to the bin and the required motors were embedded into the arm.

Block Diagram:



Flow chart :


Turn on the switch
Detect using sensor
Object detected?
No
Yes
Lid opens using robotic arm
Drop medical waste inside the bin
Lid automatically closes after preset time
Starts sterilization process using UV-C and Green LED glows
Green LED glows off
Check for filling of bin
No
Yes
Red LED glows and the bin is to be emptied

POWERPOINT PRESENTATION PRESENTED AT WABCO

SUN CLAVE

(SMART BIN WITH UV INTERFACED)

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
(DEPARTMENT OF ECE)
17/03/2022

PROBLEM STATEMENT

Are medical wastes properly disposed...?

Who will ensure the safety for Frontline Workers..?

SOLUTION

- Here comes our product....

SUN CLAVE

(SMART BIN WITH UV INTERFACED)

COMPONENTS USED

- Arduino Nano
- Ultrasonic sensor
- BO motor
- Motor driver
- UV strips
- Colored LEDs
- Switch
- Rechargeable battery
- Buck converter
- Adapter

THE EXTERNAL PARTS AND WORKING

- Ultrasonic sensor – To detect the obstacle and makes the bin open.
- BO Motor (In the arm) - Helps in opening and closing of the lid.

THE INTERNAL STRUCTURE (LID)

- Two UV strips – Helps in sterlization process.
- Ultrasonic sensor- To detect when the bin is full.

Finally ,
How to dispose medical wastes..?

THE INDICATORS

- Green LED - Glows when sterlization process is on.
- Red LED - Glows when the bin is full.

FUTURE SCOPE

- Our proposed system can be modified in such a way that it can identify the status of smart bin and detects whether it is empty or filled to customize the waste collection schedule.
- Accordingly, it can also be modified to alert the authorities, thereby reducing the cost and saving time.

CONCLUSION

- This reduces the risk of frontline workers, who are at high risk of being exposed to hazardous waste.
- These automated products would also help in preventing the environmental damages
- This also solve the problem of disposal of medical wastes.

THE BEST MOMENT

- With the team explaining the process to our Honourable **Chief Minister Thiru M.K. Stalin.**
- The product was handed over to the beneficiaries by our Chief Minister.

FINAL PHASE

SUN CLAVE

(THE SMART BIN WITH UV INTERFACED)

SOCIETAL BENEFICIAL INNOVATION

PROJECT REPORT

ON

SUN CLAVE

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

Done by:

B. Akshitha

H. Nithyasree

G. Ramya Rajani

R. Sneha Priya

S. Sneka

S. Sruthi

K. Vijay

Project guide: Mr. Kishore

Staff in charge: Mrs. Jyotshana

PROBLEM STATEMENT

There are millions of public dustbins out there that people use for throwing used mask and are emptied by the public authorities. Now the problem is that, when the public authority disposes the mask, they may be infected by the pathogens present in the mask.

SOLUTION

Automated bin interfaced with UV can solve this issue by sterilizing the used mask using the UV rays. So, the pathogens present in the mask can be eliminated and once these smart bins are implemented on a large scale thereby replacing our traditional bins present today, it highly reduces the risk of spreading diseases.

SOFTWARE USED

Arduino IDE

COMPONENTS REQUIRED

Arduino Nano, Ultrasonic sensor, BO motor, Motor driver, UV strips, Colored LEDs, Switch, Rechargeable battery, Buck converter, Adapter.

WORKING PROCEDURE

- Arduino Nano is a small, complete, flexible and breadboard-friendly Microcontroller board.
- It runs and controls all the instructions in the program sequentially to get the desired output.
- A sensor uses sound waves to determine the distance between the sensor and the closest object in its path.
- The waves travel through the air and if there is an obstacle or object, it will bounce back to the sensor.
- The sensor keeps track of the time between sending and receiving the sound wave.
- There are two sensors placed in our device: one above the lid and one below the lid.
- The sensor above the lid is used for detection of an obstacle such that it opens when placed within a specified limit.
- The sensor below the lid checks how far the bin is filled. If the detected distance is within the range, the lid doesn't open, and indicates the fullness through a red colored LED light placed at the top of the lid.

- A motor helps in performing two major functions: opening and closing of the lid.
- It rotates in two directions namely, forward and reverse.
- The forward and reverse movements aid in opening and closing of the lid respectively.
- The purpose of installing UV light in our device, is to perform the sterilization process.
- As soon as the lid closes, the UV light turns ON and begins the sterilization process.
- It automatically turns OFF, and that marks the end of the process.
- A Green colored LED turns ON right after the UV starts glowing. This indicates that the sterilization process is ongoing. It turns OFF at the same time as that of the UV.
- The Red LED is turned ON as a warning for which it means that the bin is fully filled up to its capacity and that it needs to be emptied. If the limit is reached, the LED glows until it is opened and cleaned.
- A switch is employed in this device to enable switching ON and OFF of the device whenever in use and not in use respectively.
- A battery is provided, which is made of lithium-polymer, and can be recharged whenever the battery drains out.
- This is more efficient than the conventional battery.
- A DC adapter is an external power supply used with devices that run on batteries or have no other power source.

FUTURE SCOPE

- ✓ Our proposed system can be modified in such a way that it can identify the status of smart bin and detects whether it is empty or filled to customize the waste collection schedule.
- ✓ Accordingly, it can also be modified to alert the authorities, thereby reducing the cost and saving time.
- ✓ In Real time waste management system using smart dustbin the level of the dustbin can be checked to find whether the dustbin is filled or not. This system provides the information status of the dustbins and can be accessed from anywhere you are and any point of time by the concerned authorities. It will inform the status of each dustbin to the concerned authority. So, the garbage collection vehicle can be sent only when it is needed.

- ✓ By implementing resource optimization, cost reduction and effective waste management can be done.

CONCLUSION

- ❖ This automated mask disposal smart bin has been designed as part of efforts to combat the COVID-19 for the collection and sterilization of used masks. Instead of throwing used masks into the disposal bin, disinfecting the masks is essential to break the chain of infection spread.
- ❖ The device can be used for sterilization of used facemasks before disposal, thereby reducing the risk of waste collectors, who are at high risk of being exposed to hazardous waste.
- ❖ The device could be replicated with local resources and minimum material. These automated products would also help in preventing the environmental damages and will also solve the problem of disposal of used masks. This device will be very handy in offices, homes, and other public places.

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SOCIETAL BENEFICIAL INNOVATION

SUN CLAVE

(SMART BIN WITH UV INTERFACE)

S.NO	NAME OF THE BENEFICIARY	NO OF BINS	REMARKS	SIGNATURE
1.	SMV Nursing Home Mrs.Suguna	1	Good inventory. Very useful for healthy disposal of waste in hospital management.	Suguna
2.	Mrs.Malathi Mr.Sivaraman	1	Good and glad to receive this useful product for society from your college	Sivaraman
3.	Dr.Sivashanmugavel	2	Nice work and good Product	

Smart Water Dispenser (SWAD)

PROBLEM STATEMENT

The outbreak of corona virus disease 2019 (COVID-19) has created a global health crisis that has had a deep impact on the way we perceive our world and our everyday lives.

- In India, from 3 January 2020 , 20 September 2021, there have been 33,478,419 confirmed cases of COVID-19 with 445,133 deaths, reported to WHO.
- An average of 31,473 cases per day were reported in India.

we know the importance of water among public and we also know that it is risky to drink water in public, since it involves frequent contact.

SOLUTION

In order to prevent this problem and to make sure of the availability of water for everyone, we are proposing our idea through which we have come up with a safe system to provide water for everyone. SWAD is ideal and can be fitted easily in crowded places since it is compactible and easy to handle. The UV system used in this product can destroy pathogens in objects and it does not affect the human body. So, it is safe to use by the public and there are no complicated procedures to operate it making it reliable for everyone.

SOFTWARE USED

Arduino IDE.

COMPONENTS USED

COMPONENTS	SPECIFICATIONS
1. Arduino nano	ATMEGA 328 P
2. Ultrasonic sensor	HC-SR04
3. DC-DC Buck converter	LM2596
4. Water pump	6-12v

5. Dc adapter	12V
6. Connecting wires	As Required
7. Pcb board	As Required
8. Lipo battery	12V/1500mAh
9. Ultra violet	275nm

DESCRIPTION

Our idea SWAD is a water dispenser with enhanced UV sterilizing system which would help reduce the loss of lives due to COVID-19. We propose the use of a UV light that can rapidly disinfect any object or materials. There are two main sections, one of them is for sterilization and the other one is to provide water. We have used UV-C in our project which can destroy or cease the viruses or other micro-organisms. So, along with the containers or vessels, other materials like mobile phones, purse, keys etc can also be sterilized. The sterilized vessel is held or kept inside the water compartment and the water dispenser automatically pumps water once it detects a glass or container and stops automatically after a certain period of time. In this way we will be using sterilized containers, and this will prevent the further spread of covid, and it will make sure that people use sterilized materials for drinking and other purposes.

FUTURE SCOPE

After proper testing and analysation, our product SWAD can be used in public places in future. This prevents the contamination of water, which is used by the public. Innovations like these will lead to smart and contactless future. This can be made more cost efficient so that it can be affordable by start-up companies and small-scale industries, etc. Since it requires less power supply it can also be powered by solar panel, making it environment friendly and independent of constant energy requirement.

CONCLUSION

As a whole we highly believe that our project will be beneficial for our society. In order to prevent rapid spread of COVID 19 and to make sure of the availability of water for everyone, we are proposing SWAD as a small step to make people’s life better, safer and easier.

WORKING OF EACH COMPONENT

1. Arduino NANO

Arduino is open - source platform used for building electronic projects , consists of physical programmable circuit (microprocessor ATmega328) and a software or IDE that runs the Arduino code on your computer , via USB connected to Arduino input pins. The code is written in C++ , also referred as sketches. It has 22 input/output pins and out of them 14 are digital pins and 8 are analog pins.

2. Ultrasonic Sensor

An ultrasonic sensor is an instrument that measures the distance of an object using ultrasonic sound waves. It uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity. High-frequency sound waves reflect from boundaries to produce distinct echo patterns. Ultrasonic sensors work by sending out a sound wave at a frequency above the range of human hearing. The transducer of the sensor acts as a microphone to receive and send the ultrasonic sound. The sensor determines the distance to a target by measuring time lapse between the sending and receiving of the ultrasonic pulse. It sends an ultrasonic pulse out at 40kHz which travels through the air and if there is an obstacle or object, it will bounce back to the sensor. By calculating the travel time and the speed of sound, the distance can be calculated.

3.DC Adapter

A 12v DC adapter converts input ac current to output current of voltage 12v. When power comes into a building, it is in AC, or "alternating current." AC current switches back and forth from positive to negative 60 times a second. It is carried into the building on the live wire. A second wire, called the return wire, carries the current back out of the house to complete the circuit. Then the voltage must be reduced with the help of step-down transformer built inside it. A device called a rectifier is used to turn AC into DC.

4.UV LED Strip

A UV LED strip is a new lighting form. Plus, it's a linear circuit board that's flexible. The LED tape strip has many single LED emitters on its narrow frame. And the standard UV LEDs have 5050 and 2835 SMD.

UV-C LED is the most efficient amongst the other types of strips.

It has a wavelength of 275nm. It can kill pathogens like viruses, mould, bacteria, etc., on surfaces, air, or water. Moreover, the UV-C attacks the DNA and RNA of microscopic organisms and pathogens.

Uracil and Thymine (the genetic makeup of the RNA and DNA, respectively) are quite sensitive at wavelengths of 250 nm or closer to 265 nm. But, when the wavelength is above or longer than 300 nm, absorption of the nucleic acid is almost impossible.

5. Li-Po Battery

When you plug a lithium-ion battery into a device or piece of equipment, the positively charged ions move from the anode to the cathode. As a result, the cathode becomes more positively charged than the anode. This, in turn, attracts negatively charged electrons to the cathode. A separator in the cell includes electrolytes that form a catalyst. This promotes ion movement between them. The movement of ions through the electrolyte solution is what causes the electrons to move through the device the battery is plugged into. Lithium-ion batteries are rechargeable. When recharging, the lithium ions go through the same process, but in the opposite direction. This restores the battery for additional use.

SWAD

கோவிட் 19 அனைவரின் வாழ்க்கையிலும் மோசமான தாக்கத்தை ஏற்படுத்தியுள்ளது. மற்றவர்களுடன் நேரடியாகவோ அல்லது மறைமுகமாகவோ தொடர்பு கொள்வதே இந்த பரவலுக்கு முக்கிய காரணம்.

SWAD என்பது மேம்பட்ட புற ஊதா ஒளி அமைப்பைக் கொண்ட நீர் விநியோகஸ்தர் ஆகும், இது COVID-19 காரணமாக ஏற்படும் உயிர் இழப்பைக் குறைக்க உதவும். எந்தவொரு பொருளையும் அல்லது பொருட்களையும் விரைவாக கிருமி நீக்கம் செய்யக்கூடிய புற ஊதா ஒளியைப் பயன்படுத்த நாங்கள் முன்மொழிகிறோம். இரண்டு முக்கிய பிரிவுகள் உள்ளன,அவற்றில் ஒன்று கருத்தடை செய்வதற்கும் மற்றொன்று தண்ணீர் வழங்குவதற்கும் ஆகும். வைரஸ்கள் அல்லது பிற நுண்ணுயிரிகளை அழிக்க அல்லது நிறுத்தக்கூடிய UV-C ஐ எங்கள் திட்டத்தில் பயன்படுத்தியுள்ளோம். கொள்கலன்களுடன்,கிருமி நீக்கம் செய்யப்பட்ட பாத்திரம் தண்ணீர் பெட்டியின் உள்ளே

வைக்கப்படுகிறது அல்லது வைக்கப்படுகிறது மற்றும் தண்ணீர் விநியோகிப்பவர் தானாகவே ஒரு கண்ணாடி அல்லது கொள்கலனைக் கண்டறிந்து ஒரு குறிப்பிட்ட காலத்திற்குப் பிறகு தானாகவே நின்றுவிடும். இந்த வழியில் நாங்கள் கருத்தடை செய்யப்பட்ட கொள்கலன்களைப் பயன்படுத்துவோம், மேலும் இது கோவிட் மேலும் பரவுவதைத் தடுக்கும், மேலும் மக்கள் குடிப்பதற்கும் பிற நோக்கங்களுக்காகவும் கருத்தடை செய்யப்பட்ட பொருட்களைப் பயன்படுத்துவதை இது உறுதி செய்யும்.

தொடக்க நிறுவனங்கள், உள்ளூர் உணவு கடைகள், சிறிய கல்வி நிறுவனங்கள், தியேட்டர்கள், வீட்டு வாடிக்கையாளர்கள் ஆகியவற்றில் SWAD செயல்படுத்தப்படலாம். மற்ற சந்தைப் பொருட்களுடன் ஒப்பிடுகையில் SWAD குறைவான சக்தியை (2.03 யூனிட்ஸ்/மாதம்) பயன்படுத்துகிறது மற்றும் செலவு குறைந்ததாகும்.

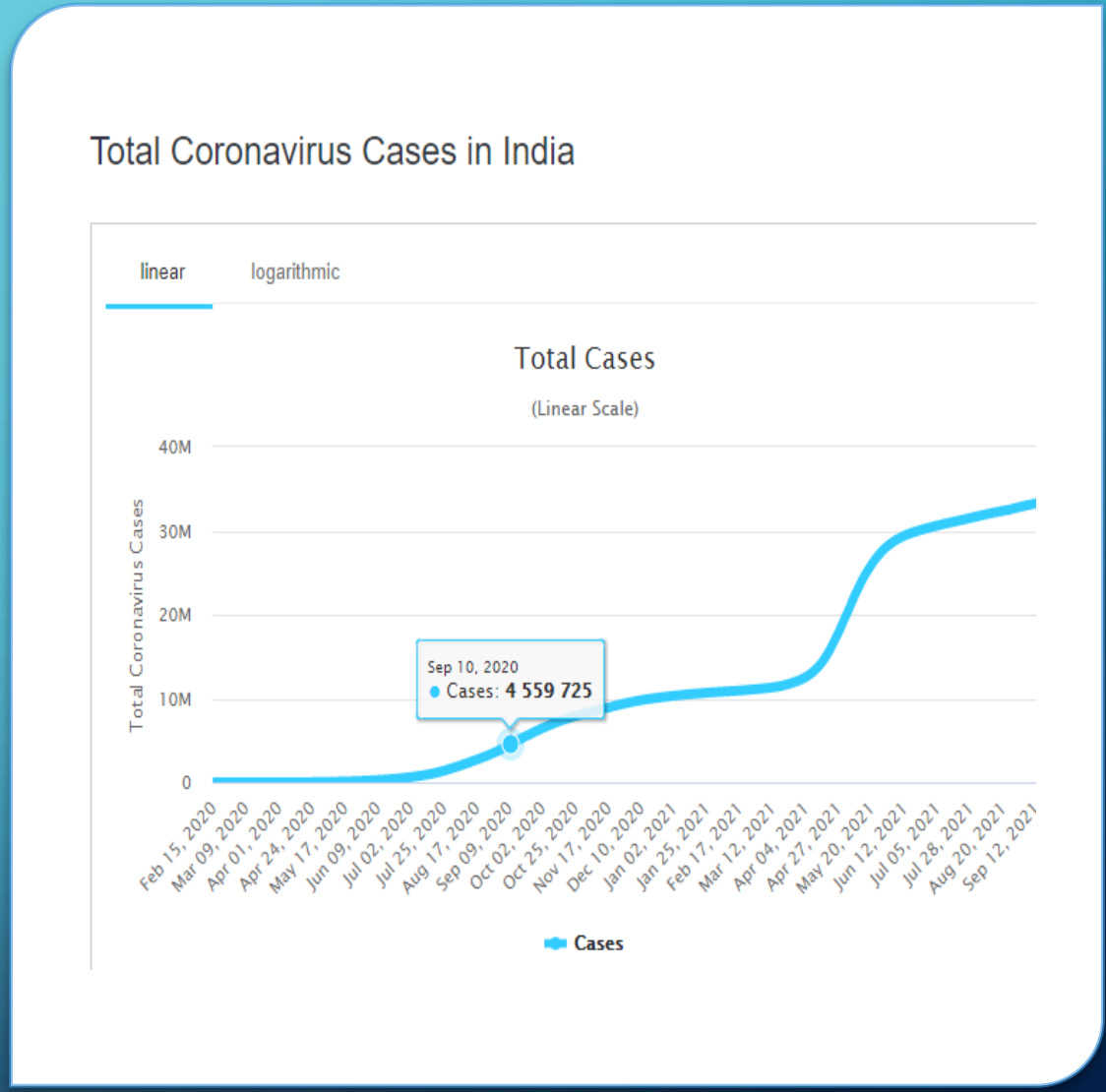
SWAD இன் முக்கிய நன்மை தொடர்பற்றது மற்றும் கையடக்கமானது. இது எந்த இடத்திலும் நிறுவப்படலாம் மற்றும் சிறிய பகுதிகளில் கூட பொருந்தும்.

DO YOU THINK WE CAN MINIMIZE COVID SPREAD IN PUBLIC PLACES ?

OF COURSE WE CAN…

LITERATURE SURVEY

- IN **INDIA**, FROM **3 JANUARY 2020** TO **7:03PM CEST, 20 SEPTEMBER 2021**, THERE HAVE BEEN **33,478,419 CONFIRMED CASES** OF COVID-19 WITH **445,133 DEATHS**, REPORTED TO WHO.
- AN AVERAGE OF 31,473 CASES **PER DAY** WERE REPORTED IN **INDIA**



“

You can’t solve a problem on the same level that it was created.you have to rise above it to the next level

- Albert Einstein

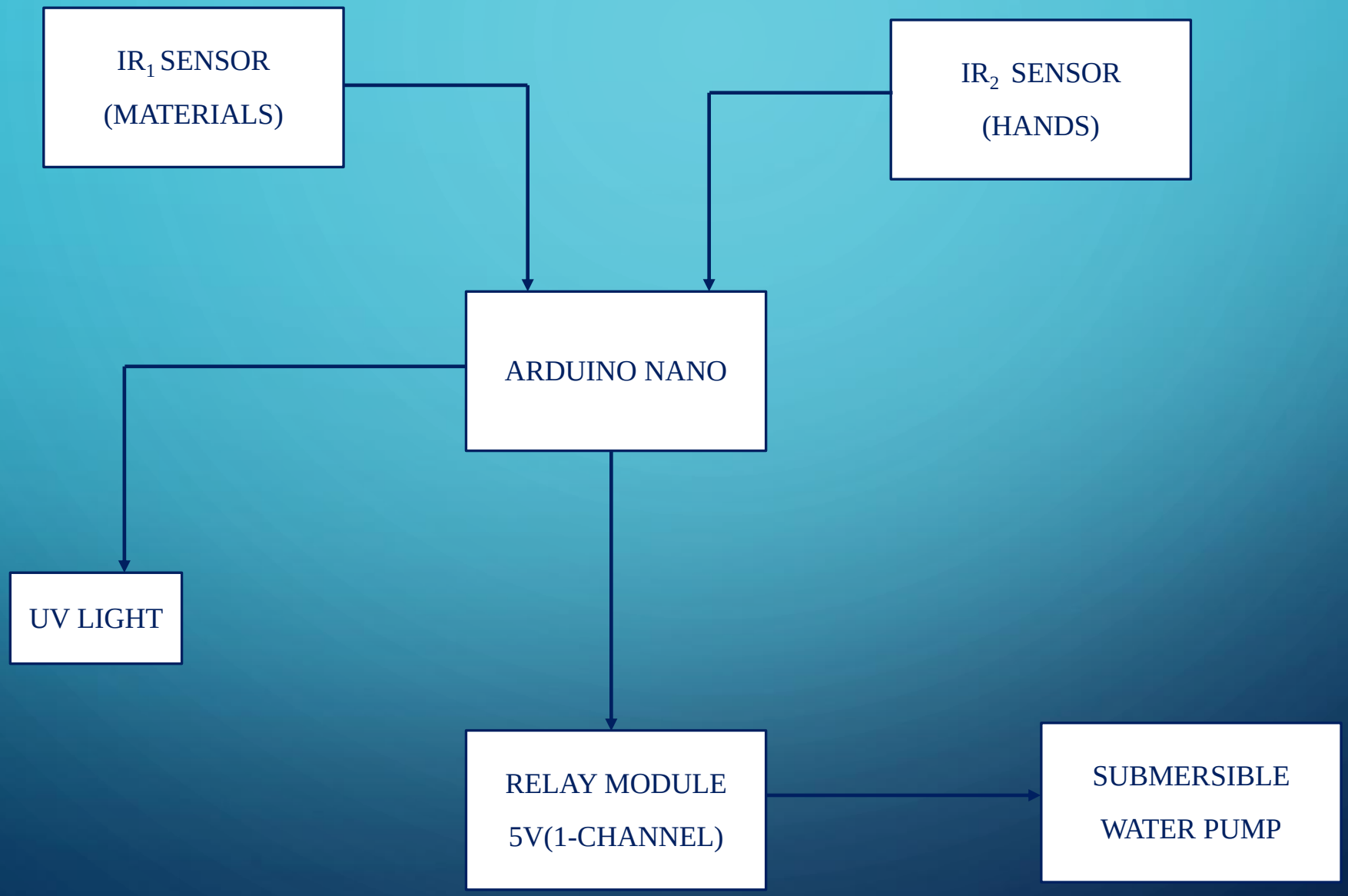
SMART WATER DISPENSER

((SWAD))

ABSTRACT

Smart Water Dispenser (SWAD) uses Arduino nano (AT mega 328P) as it's microcontroller, the IR sensor used in this circuit detects any material that comes within its range and sends signal , which in turn closes the switch in the relay and as a whole turning on the circuit and the drinking water is dispensed out through submersible pump, thus pumps out only required amount of Sanitizer. This also sterilizes the glass, cups and bottles exposing UV light upon them. SWAD is totally automated, non-contact, low-cost and it can find its use in hospitals, workplaces, schools and some other public places, etc.

BLOCK DIAGRAM



S.NO	MATERIALS	QUANTITY	AMOUNT
1	Arduino Nano V3(with USB cable)	1	425
2	IR Proximity Sensor(chip-LM393)	2	128
3	Breadboard(840 points)	1	150
4	Relay Module-5V(1-channel)	1	69
5	Submersible water pump	1	200
6	Male to Female jumper wires	few	80
7	Hardboard	2(4*2)	250
8	Clamp	10	30
9	Keel	4	20
10	Pat LOCK	1	15
11	Fevi stick	20	100
12	Fevicol	1	20
13	glue gun stick	1	30
14	Connecting wires	few	10
15	LED	4	8
16	Button cell	1	18
			SUM=1553

ADVANTAGES

- LOW-COST
- RELIABLE
- CONTACT-LESS
- LOW POWER CONSUMPTION
- ECO-FRIENDLY

REAR

SIDE

SIDE

TOP IN

MIDDLE

FRONT IN

TOP

FRONT

BOTTOM

MATERIALS QUOTATION

S NO	COMPONENTS	SPECIFICATIONS	QUANTITY	PRICE
1	ARDUINO NANO	ATMEGA 328 p	1	400
2	ULTRASONIC SENSOR	HC-SR04	2	300
3	SINGLE CHANNEL RELAY	5 V	2	140
4	PUMP	12 V, 2 WAY	1	350
5	DC ADAPTER	12 V	1	150
6	CONNECTING WIRES		2 (METER)	50
7	BUCK CONVERTER (DC-DC)	1 Sq. ft	1	175
8	UV LED STRIP	12V / 254nm	6(CENTI METER)	700
9	LIPO BATTERY(rechargeable) (with charger)	12V / 2000 mAh	1	850
10	FEMALE SOCKET	XT60	2	260
11	MALE TO FEMALE JUMPER		**20**	**150**
12	DC ADAPTOR (FEMALE SOCKET)		1	75
13	HEAT SHRINK		2(METER)	20
14	ALUMINUM SHEET		3*3(METER)	300
15	MINI SCREW		100 PIECES	50
16	RO TUBE		2 (METER)	30
17	SILICA GEL		280 (ML)	130

TOTAL **4130**

	12V DC PUMP					cooling period
DATE	S NO	VOLTAGE (V)	CURRENT (mA)	WORKING STATUS	HEAT	9min 30 sec
22/10/2021	1	5	123-190	WORKING WITH LAG	NO HEAT	
	2	6	260-350	WORKING SLOWLY	NO HEAT	
	3	7	380-620	MODERATE	NO HEAT	
	4	8	660-930	SMOOTH	NO HEAT	
	5	9	320-1020	SMOOTH	NO HEAT	
	6	10	410-930	SMOOTH	NO HEAT	
	7	11	320-1650	SMOOTH	LOW HEAT EMISSION	
	8	12	490-2020	EFFECIENTLY	MILD HEAT EMISSION	
23/10/2021	9	5	180-190	HARDLY WORKING	NO HEAT	
	10	6	200-230	WORKING SLOWLY	NO HEAT	
	11	7	240-250	MODERATE	NO HEAT	
	12	8	260-280	SMOOTH	NO HEAT	
	13	9	290-310	SMOOTH	NO HEAT	
	14	10	330-350	SMOOTH	NO HEAT	
	15	11	330-420	MEDIUM SUCTION PRESSURE	LOW HEAT EMISSION	
	16	12	350-500	HIGH SUCTION PRESSURE	MILD HEAT EMISSION	
25/10/2022	17	5	200-210	HARDLY WORKING	NO HEAT	
	28	6	220-230	WORKING SLOWLY	NO HEAT	
	19	7	230-260	MODERATE	NO HEAT	
	20	8	280	SMOOTH	NO HEAT	
	21	9	310-400	SMOOTH	NO HEAT	
	22	10		SMOOTH	NO HEAT	
	23	11	620-710	MEDIUM SUCTION PRESSURE	LOW HEAT EMISSION	
	24	12	360-580	HIGH SUCTION PRESSURE	LOW HEAT EMISSION	
27/10/2021	1	5	193.9-194.7	WORKING WITH LAG	NO HEAT	
	2	6	220-230	WORKING SLOWLY	NO HEAT	
	3	7	260-380	MODERATE	NO HEAT	
	4	8	280-430	SMOOTH	NO HEAT	
	5	9	300-470	SMOOTH	NO HEAT	
	6	10		SMOOTH	NO HEAT	
	7	11	500-850	SMOOTH	LOW HEAT EMISSION	
	8	12	700-1120	EFFECIENTLY	MILD HEAT EMISSION	
28/10/2021	1	5	210	WORKING WITH LAG	NO HEAT	
	2	6	230-240	WORKING SLOWLY	NO HEAT	
	3	7	250	MODERATE	NO HEAT	
	4	8	280	SMOOTH	NO HEAT	
	5	9	300	SMOOTH	NO HEAT	
	6	10	330-530	SMOOTH	NO HEAT	
	7	11	340-490	SMOOTH	LOW HEAT EMISSION	
	8	12	510-810	EFFECIENTLY	MILD HEAT EMISSION	
29/10/2021	1	5	180-190	WORKING WITH LAG	NO HEAT	
	2	6	210-220	WORKING SLOWLY	NO HEAT	
	3	7	230-250	MODERATE	NO HEAT	
	4	8	250-260	SMOOTH	NO HEAT	
	5	9	280	SMOOTH	NO HEAT	
	6	10	300	SMOOTH	NO HEAT	
	7	11	320	SMOOTH	LOW HEAT EMISSION	
	8	12	330-340	EFFECIENTLY	MILD HEAT EMISSION	

DATE	Voltage	Time (min)	Pump heat	
			metal	plastic
22/10/2021	11	5	warm	normal
		10	warmer	normal
		15	hot	normal
23/10/2021	11	5	warm	normal
		10	warmer	normal
		12	hot	normal
		15	hot	normal
25/10/2021	11	5	warm	normal
		10	hot	normal
		15	very hot	normal
27/10/2021	11	5	warm	normal
		10	hot	normal
		15	very hot	normal
28/10/2021	11	5	mild warm	normal
		10	warm	normal
		15	hot	normal
29/10/2021	11	5	mild warm	normal
		10	warm	normal
		15	hot	normal

glass filling time 6s 45ms

TIME (seconds)	PUMP HEAT AS LAPS				
	DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
30	no heat	No heat	No heat	No heat	No heat
1	no heat	No heat	No heat	No heat	No heat
3	no heat	No heat	No heat	No heat	No heat
3:30	no heat	No heat	No heat	No heat	No heat
4	no heat	No heat	No heat	No heat	No heat
4:30	no heat	No heat	No heat	No heat	No heat
5	no heat	No heat	No heat	No heat	No heat
5:30	no heat	No heat	No heat	No heat	No heat
6	no heat	No heat	No heat	No heat	No heat
6:30	no heat	No heat	No heat	No heat	No heat
7	no heat	No heat	No heat	No heat	No heat
7:30	no heat	No heat	No heat	No heat	No heat
8	no heat	No heat	No heat	No heat	No heat
8:30	no heat	No heat	No heat	No heat	No heat
9	no heat	No heat	No heat	No heat	No heat
9 30	no heat	No heat	No heat	No heat	No heat
10	no heat	No heat	No heat	No heat	No heat
10 30	no heat	No heat	No heat	No heat	No heat
11	no heat	No heat	No heat	No heat	No heat
11 30	no heat	No heat	No heat	No heat	No heat
12	no heat	No heat	No heat	No heat	No heat
12 30	no heat	No heat	No heat	No heat	No heat
13 30	no heat	No heat	No heat	No heat	No heat
14	no heat	No heat	No heat	No heat	No heat
14 30	no heat	No heat	No heat	No heat	No heat
15	no heat	No heat	No heat	No heat	No heat
15 30	no heat	No heat	No heat	No heat	No heat
16	no heat	No heat	No heat	No heat	No heat
16 30	no heat	No heat	No heat	No heat	No heat
17	no heat	No heat	No heat	No heat	No heat
18 45	no heat	No heat	No heat	No heat	No heat
19	no heat	No heat	No heat	No heat	No heat
19 15	no heat	No heat	No heat	No heat	No heat
19 30	no heat	No heat	No heat	No heat	No heat
19 45	no heat	No heat	No heat	No heat	No heat
20	no heat	No heat	No heat	No heat	No heat
20 15	no heat	No heat	No heat	No heat	No heat
20 30	no heat	No heat	No heat	No heat	No heat
22	mild warm	vv mild	vv mild	vv mild	vv mild
22 15	mild warm	vv mild	vv mild	vv mild	vv mild
22 30	mild warm	mild warm	mild warm	mild warm	mild warm
22 45	mild warm	mild warm	mild warm	mild warm	mild warm
23	mild warm	mild warm	mild warm	mild warm	mild warm
23 15	mild warm	mild warm	mild warm	mild warm	mild warm
23 30	mild warm	mild warm	mild warm	mild warm	mild warm
23 45	mild warm	mild warm	mild warm	mild warm	mild warm
24	mild warm	mild warm	mild warm	mild warm	mild warm

DATE	S NO	VOLTAGE (V)	CURRENT (mA)	WORKING STATUS	HEAT
22/10/2021	1	5	-	not working	No
	2	6	-	not working	No
	3	7	-	not working	No
	4	8	-	not working	No
	5	9	0.3 - 2.7	mild working	No
	6	10	15.1 - 4.8	good working	No
	7	11	41.8 - 49.6	working efficiently	warm
	8	11.5	49.2 - 65.7	working efficiently	warm
23/10/2021	9	5	-	not working	No
	10	6	-	not working	No
	11	7	-	not working	No
	12	8	-	not working	No
	13	9	21.0 - 21.5	mild working	No
	14	10	30.1 - 32.2	good working	No
	15	11	49.7 - 55.0	working efficiently	warm
	16	11.5	62.5 - 71.9	working efficiently	warm
25/10/2021	17	5	-	not working	No
	18	6	-	not working	No
	19	7	-	not working	No
	20	8	-	not working	No
	21	9	6.6 - 6.7	mild working	No
	22	10	31.1 - 31.5	good working	No
	23	11	62.4 - 63.1	working efficiently	warm
	24	11.5	77.6-79.9	working efficiently	warm
27/10/2022	25	5	0	not working	No
	26	6	0	not working	No
	27	7	0	not working	No
	28	8	38.5	not working	No
	29	9	4.6	mild working	No
	30	10	15.9 - 16	good working	No
	31	11	31.2	working efficientily	warm
	32	11.5	39.7	working efficientily	warm
28/10/2023	33	5	0	not working	No
	34	6	0	not working	No
	35	7	0	not working	No
	36	8	0	not working	No
	37	9	9.4-9.7	mild working	No
	38	10	17.3	good working	No
	39	11	29.5	working efficientily	warm
	40	11.5	38.5	working efficientily	warm
29/10/2024		5	0	not working	No
		6	0	not working	No
		7	0	not working	No
		8	0	not working	No
		9	9.4-9.7	mild working	No
		10	17.1	good working	No
		11	29.7	working efficientily	warm
		11.5	39.7	working efficientily	warm

DATE	VOLTAGE	TIME (min)	UV
22/10/2021	11.5	5	WARM
		10	MILD HEAT
		15	WARM
		20	WARM
		25	HOT
23/10/2021	11.5	5	WARM
		10	MILD HEAT
		15	MILD HEAT
		20	WARM
		25	HOT
25/10/2021	11.5	5	VERY MILD HOT
		10	WARM
		15	WARMER
		20	HOT
		25	HOT
27/10/2021	11.5	5	WARM
		10	MILD HEAT
		15	MILD HEAT
		20	WARM
		25	HOT
28/10/2022	11.5	30	WARM
		35	MILD HEAT
		40	MILD HEAT
		45	WARM
		50	HOT
29/10/2023	11.5	55	WARM
		60	MILD HEAT
		65	MILD HEAT
		70	WARM
		75	HOT

RELAY 1 (Vmin 1.)

DATE	S NO	VOLTAGE (V)	CURRENT (mA)	WORKING STATUS	HEAT
22/10/2021	1	3	0 to 0.5	good	no
	2	3.5	0.6 to 0.9	good	no
	3	4	1.3	efficiently	no
	4	4.5	1.8	efficiently	no
	5	5	2.2	efficiently	no
	6	5.5	2.7	efficiently	no
23/10/2021	7	3	0-0.5	good	no
	8	3.5	0.5-0.9	good	no
	9	4	1.4	good	no
	10	4.5	1.8	efficiently	no
	11	5	2.3	efficiently	no
	12	5.5	2.8	efficiently	no
25/10/2021	13	3	0.5	good	no
	14	3.5	0.9	good	no
	15	4	1.4	good	no
	16	4.5	1.9	good	no
	17	5	2.3	efficiently	no
	18	5.5	2.8	efficiently	no
27/10/2021	19	3	0.5	good	no
	20	3.5	0.9	good	no
	21	4	1.3-1.4	efficiently	no
	22	4.5	1.8	efficiently	no
	23	5	2.2-2.3	efficiently	no
	24	5.5	2.8	efficiently	no
28/10/2021	25	3	0.5	good	no
	26	3.5	0.9	good	no
	27	4	1.3	efficiently	no
	28	4.5	1.8	efficiently	no
	29	5	2.2-2.3	efficiently	no
	30	5.5	2.83	efficiently	no
28/10/2022	31	6	2.2	good	no
	32	6.5	2.63	good	no
	33	7	3.06	efficiently	no
	34	7.5	3.49	efficiently	no
	35	8	2.2-2.4	efficiently	no
	36	8.5	3.83	efficiently	no

DATE	Voltage	Time (min)	relay heat	
			ic up	plastic
22/10/2021	**5**	**5**	NO	NO
		10	NO	NO
		15	NO	NO
23/10/2021	**5**	**5**	NO	NO
		10	NO	NO
		15	NO	NO
25/10/2021	**5**	**5**	NO	NO
		10	NO	NO
		15	NO	NO
27/10/2022	**6**	**20**	NO	NO
		25	NO	NO
		30	NO	NO
28/10/2023	**7**	**35**	NO	NO
		40	NO	NO
		45	NO	NO
29/10/2024	**8**	**50**	NO	NO
		55	NO	NO
		60	NO	NO

RELAY2(Vmin 2.0)

DATE	S NO	VOLTAGE (V)	CURRENT (mA)	WORKING STATUS	HEAT
22/10/2021	1	3	1.2	GOOD	NO
	2	3.5	1.6	GOOD	NO
	3	4	2.1 - 2.2	GOOD	NO
	4	4.5	2.6 -2.7	EFFICIENTLY	NO
	5	5	3.2	EFFICIENTLY	NO
	6	5.5	3.2 -3.6	EFFICIENTLY	NO
23/10/2021	7	3	1.2	GOOD	NO
	8	3.5	1.6	GOOD	NO
	9	4	2.2	GOOD	NO
	10	4.5	2.2-2.5	EFFICIENTLY	NO
	11	5	3.1	EFFICIENTLY	NO
	12	5.5	3.5	EFFICIENTLY	NO
25/10/2021	13	3	1.2-1.3	GOOD	NO
	14	3.5	1.5-1.8	GOOD	NO
	15	4	2.2-2.3	GOOD	NO
	16	4.5	2.7-2.8	EFFICIENTLY	NO
	17	5	3.1-3.2	EFFICIENTLY	NO
	18	5.5	3.6-3.7	EFFICIENTLY	NO
27/10/2022	19	3	1.2	good	no
	20	3.5	1.7	good	no
	21	4	2.2	efficiently	no
	22	4.5	2.7	efficiently	no
	23	5	3.2	efficiently	no
	24	5.5	3.6	efficiently	no
28/10/2023	25	3	1.2	good	no
	26	3.5	1.7	good	no
	27	4	2.2	efficiently	no
	28	4.5	3.3	efficiently	no
	29	5	3.2	efficiently	no
	30	5.5	3.7	efficiently	no
29/10/2024	31	3	1.2	good	no
	32	3.5	1.7	good	no
	33	4	2.2	efficiently	no
	34	4.5	3.3	efficiently	no
	35	5	3.2	efficiently	no
	36	5.5	3.7	efficiently	no

DATE	VOLTAGE	TIME (min)	RELAY HEAT	
			IC UP	PLASTIC
22/10/2021	**5**	**5**	NO	NO
		10	NO	NO
		15	NO	NO
23/10/2021	5	**5**	NO	NO
		10	NO	NO
		15	NO	NO
25/10/2021	**5**	**5**	NO	NO
		10	NO	NO
		15	NO	NO
27/10/2021	**5**	**5**	NO	NO
		10	NO	NO
		15	NO	NO
28/10/2022	**5**	**5**	NO	NO
		10	NO	NO
		15	NO	NO
29/10/2023	**5**	**5**	NO	NO
		10	NO	NO
		15	NO	NO

DATE	S NO	VOLTAGE (V)	CURRENT (mA)		
1/11/2021	1	5	1.9-2	US 1	
	2		1.9-2	US 2	
	3		1.4	R1	
	4		49.6-51.3	R2	2.5 WHEN WORKING

DATE	S NO	VOLTAGE (V)	CURRENT (mA)	R1	R2
1/11/2021	1	3	7-7.1	NO	NO
	2	3.5	7.2-7.3	NO	NO
	3	4	56.5-56.8	95.9-96	15.8-16
	4	4.5	65.1-65.4	110.4-110.5	18.6-18.8
	5	5	75.3-75.5	126.4-127.5	21.7-22.9
	6	5.5	85.1-85.3	143.0-143.4	25.5-25.7
	7	6	95.7-95.9	159.0-159.3	27.7-27.8
	8	7	94.2-94.5	164.5	27.7-27.8

WORKING STATUS							
DATE	S NO	VOLTAGE (V)	CURRENT (mA)	RELAY1	RELAY 2	ULTRASONIC 1	ULTRASONIC 2
1/11/2021	1	3	7-7.1	NO	YES	NO	NO
	2	3.5	7.2-7.3	NO	YES	NO	NO
	3	4	56.5-56.8	NO SOUND	YES	YES	YES
	4	4.5	65.1-65.4	YES	YES	YES	YES
	5	5	75.3-75.5	YES	YES	YES	YES
	6	5.5	85.1-85.3	YES	YES	YES	YES
	7	6	95.7-95.9	YES	YES	YES	YES
	833	7	94.2-94.5	YES	YES	YES	YES

RELAY WHEN UNDER WORKING(SENSOR DETECTION)					
DATE	S NO	VOLTAGE (V)	CURRENT (mA)	R1	R2
1/11/2021	1	3	7-7.1	NO	NO
	2	3.5	7.2-7.3	NO	NO
	3	4	56.5-56.8	95.9-96	15.8-16
	4	4.5	65.1-65.4	110.4-110.5	18.6-18.8
	5	5	75.3-75.5	126.4-127.5	21.7-22.9
	6	5.5	85.1-85.3	143.0-143.4	25.5-25.7
	7	6	95.7-95.9	159.0-159.3	27.7-27.8
	833	7	94.2-94.5	164.5	27.7-27.8

CUREENT THROUGH COMPONENTS					
DATE	S NO	VOLTAGE (V)	COMPONENT	CURRENT (mA)	
1/11/2021	1	5	US 1	1.9 - 2	
	2		US 2	1.9 - 2	
	3		R1	1.4	
	4		R2	49.6 - 51.3	2.5 WHEN WORKING

WORKING STATUS							
DATE	S NO	VOLTAGE (V)	CURRENT (mA)	RELAY1	RELAY 2	ULTRASONIC 1	ULTRASONIC 2
2/11/2021	1	3	7	NO	YES	NO	NO
	2	3.5	7.8-7.9	YES	NO	NO	NO
	3	4	51.6	NO SOUND	NO SOUND	YES	YES
	4	4.5	59.5	YES	YES	YES	YES
	5	5	72.0-72.2	YES	YES	YES	YES
	6	5.5	77.8	YES	YES	YES	YES
	7	6	89.1-89.4	YES	YES	YES	YES
	8	7	90.8	YES	YES	YES	YES

RELAY WHEN UNDER WORKING(SENSOR DETECTION)					
DATE	S NO	VOLTAGE (V)	CURRENT (mA)	R1	R2
2/11/2021	1	3	7	NO	NO
	2	3.5	7.8-7.9	NO	NO
	3	4	51.6	51.4	14.9
	4	4.5	59.5	99.6	18.3
	5	5	72.0-72.2	115.6	21.6-21.7
	6	5.5	77.8	127	25
	7	6	89.1-89.4	143.5-143.7	27.6-27.8
	8	7	90.8	155.6	27.7-27.8

CUREENT THROUGH COMPONENTS						
DATE	S NO	VOLTAGE (V)	COMPONENT	CURRENT (mA)		VOLTAGE
2/11/2021	1	5	US 1	1.9 - 2		3.8
	2		US 2	1.9 - 2	48.3	4.1
	3		R1	1.4	48.3 WHEN WORKING	3.8
	4		R2	49.6 - 51.3	2.5 WHEN WORKING	3.7

REPORT

64216120131104

SWAD PEN 0-MIN

PID NO: P642100756845
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131104
Registered On:
29/12/2021 11:27 AM
Collected On:
29/12/2021 11:28AM
Reported On:
31/12/2021 03:39 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SWAD PEN 0-MIN	*Aerobic spore formers

Comments : * Need disinfection

-- End of Report --

Dr.B.R. PRAKASH RAO MD
Consultant Microbiologist

Dr. KAVITA V
MD, DIP NB

Prakash.Rao

REPORT

64216120131105

SWAD PEN 2-MIN

PID NO: P642100756849
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131105
Registered On:
29/12/2021 11:30 AM
Collected On:
29/12/2021 11:29AM
Reported On:
31/12/2021 03:57 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SWAD PEN 2-MIN	No growth

Comments : Satisfactory.

-- End of Report --

Consultant Microbiologist
MBBS MD Microbiologist

Dr. KAVITA V
MD, DIP NB

Dr. Lakshmi Priya

REPORT

64216120131106

SWAD PEN 15-MIN

PID NO: P642100756851
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131106
Registered On:
29/12/2021 11:30 AM
Collected On:
29/12/2021 11:30AM
Reported On:
31/12/2021 03:57 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SWAD PEN 15-MIN	No growth

Comments : Satisfactory.

-- End of Report --

Consultant Microbiologist
MBBS MD Microbiologist

Dr. KAVITA V
MD, DIP NB

Dr. Lakshmi Priya

REPORT

64216120131107

SWAD PEN 30-MIN

PID NO: P642100756853
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131107
Registered On:
29/12/2021 11:31 AM
Collected On:
29/12/2021 11:32AM
Reported On:
31/12/2021 03:58 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SWAD PEN 30-MIN	No growth

Comments : Satisfactory.

-- End of Report --

Consultant Microbiologist
MBBS MD Microbiologist

Dr. KAVITA V
MD, DIP NB

Dr. Lakshmi Priya

REPORT

64216120131108

SWAD PEN 60-MIN

PID NO: P642100756858
Age: 0.0 Year(s) Sex: NA

Reference: Dr.SELF

Sample Collected At:
ARC-RA-Lab4U Enterprises
Ground Floor,No.9/2B,Dr.Subburayan Nagar 4th Street,Kodambakkam,Chennai-600024.
PROCESSING LOCATION:- Metropolis Healthcare Ltd, #3, Jagannathan Road, Nungambakkam, Chennai - 600 034

VID: 64216120131108
Registered On:
29/12/2021 11:33 AM
Collected On:
29/12/2021 11:33AM
Reported On:
31/12/2021 03:58 PM

OT Microbiological Surveillance(1 Swab)

Sr.No.	Site	Aerobic Culture
1	SWAD PEN 60-MIN	No growth

Comments : Satisfactory.

-- End of Report --

Consultant Microbiologist
MBBS MD Microbiologist

Dr. KAVITA V
MD, DIP NB

Dr. Lakshmi Priya

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 600 024.

SWAD

Be the Osmotic Flow

SWAD (Smart Water Dispenser) is a revamped automatic water dispenser with enhanced UV sterilizing system that can rapidly disinfect any materials like containers or vessels mobile phones, purse, keys, etc. which will make sure that people use sterilized materials for drinking and other purposes and also it will prevent the further spread of covid and help to reduce the loss of lives due to COVID-19.

SWAD (ஸ்மார்ட் வாட்டர் டிஸ்பென்சர்) என்பது மேம்படுத்தப்பட்ட புற ஊதா ஒளியைப் பயன்படுத்தி சுத்திகரிக்கும் திறன் கொண்ட புதுப்பிக்கப்பட்ட தானியங்கி நீர் விநியோகம் செய்யும் கருவி ஆகும். இது பாத்திரங்கள், கைபேசி, பை, சாவிகள் போன்ற எந்தவொரு பொருட்களையும் விரைவாக கிருமி நீக்கம் செய்யக்கூடியது. எனவே, இது கோவிட் மேலும் பரவாமல் தடுக்கும் மற்றும் கோவிட்-19 காரணமாக ஏற்படும் உயிர் இழப்பைக் குறைக்க உதவும்.

TEAM MEMBERS

JAYACHANDAR P
II ECE A

ASHOK CHANDER S
II ECE A

KENNETH DAVE MATHEW J
II ECE A

YAMUNAEASWAR M
II ECE B

VARSHAA K G
II ECE B

SUMEETHANJALI A
II ECE B

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

363, Arcot Road, Kodambakkam, Chennai – 600 024.

SWAD

Be the Osmotic Flow

SWAD (Smart Water Dispenser) is a revamped automatic water dispenser with enhanced UV sterilizing system that can rapidly disinfect any materials like containers or vessels mobile phones, purse, keys, etc. which will make sure that people use sterilized materials for drinking and other purposes and also it will prevent the further spread of covid and help to reduce the loss of lives due to COVID-19.

SWAD (ஸ்மார்ட் வாட்டர் டிஸ்பென்சர்) என்பது மேம்படுத்தப்பட்ட புற ஊதா ஒளியைப் பயன்படுத்தி சுத்திகரிக்கும் திறன் கொண்ட புதுப்பிக்கப்பட்ட தானியங்கி நீர் விநியோகம் செய்யும் கருவி ஆகும். இது பாத்திரங்கள், கைபேசி, பை, சாவிகள் போன்ற எந்தவொரு பொருட்களையும் விரைவாக கிருமி நீக்கம் செய்யக்கூடியது. எனவே, இது கோவிட் மேலும் பரவாமல் தடுக்கும் மற்றும் கோவிட்-19 காரணமாக ஏற்படும் உயிர் இழப்பைக் குறைக்க உதவும்.

पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
OF
THE PATENT OFFICE

निर्गमन सं. 31/2022	शुक्रवार	दिनांक: 05/08/2022
ISSUE NO. 31/2022	FRIDAY	DATE: 05/08/2022

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :01/08/2022

(21) Application No.202241043888 A
(43) Publication Date : 05/08/2022

(54) Title of the invention : SWAD (Smart Water Dispenser)

(51) International classification :F25D0023120000, B67D0003000000, C02F0001320000, C02F0001440000, A47J0031000000
(86) International Application No :PCT//
Filing Date :01/01/1900
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

(71)**Name of Applicant :**
1)BABAI K S
Address of Applicant :363, Arcot Road, Kodambakkam, Chennai -24 ---------- ----------
2)Ms. Siji Sivanandan
3)Dr. A. Babiyola
4)Ms. S M Janani
5)Mr. P Jayachandar
6)Mr. S Ashok Chander
7)Mr. J Kenneth Dave Mathew
8)Ms. M Yamunaeaswari
9)Ms. A Sumeethanjali
10)Ms. K G Varshaa
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)BABAI K S
Address of Applicant :363, Arcot Road, Kodambakkam, Chennai -24 ---------- ----------
2)Ms. Siji Sivanandan
Address of Applicant :Associate Professor, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024. ---------- ----------
3)Dr. A. Babiyola
Address of Applicant :Professor, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024. ---------- ----------
4)Ms. S M Janani
Address of Applicant :Assistant Professor, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024. ---------- ----------
5)Mr. P Jayachandar
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024. ---------- ----------
6)Mr. S Ashok Chander
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024 ---------- ----------
7)Mr. J Kenneth Dave Mathew
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024 ---------- ----------
8)Ms. M Yamunaeaswari
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024. ---------- ----------
9)Ms. A Sumeethanjali
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024. ---------- ----------
10)Ms. K G Varshaa
Address of Applicant :Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024 ---------- ----------

(57) Abstract :
SWAD (SMART WATER DISPENSER) The Smart Water Dispenser (SWAD) is a device invented to ensure safe and germ-free dispensing of water. The lack of proper sanitization of vessels is a major reason for the contamination of water. To prevent this issue, an UV system is introduced in this device to curtail the function of bacteria, viruses, and other pathogens. And it provides a built-in water dispenser system adjacent to the UV system. It requires less power supply and can be powered by a battery making it independent of constant energy requirement.

No. of Pages : 14 No. of Claims : 9

SMART SANITIZING DEVICE

MICROCONTROLLER	ATmega328 , 16MHz – 2KB SRAM
OPERATING VOLTAGE	5 volts
INPUT VOLTAGE(Vin)	7-12 volts
FLASH MEMORY	32KB
ANALOG INPUT PINS	8
DIGITAL INPUT PINS	22
BUILD IN LED PINS	13
DC CURRENT PER I/O PINS	40mA
MAX. CURRENT PER I/O PINS	20mA
MAX. CURRENT PER +3.3V PIN	50mA
POWER CONSUMPTION	19mA
PCB SIZE OF ARDUINO	18 X 45mm
WEIGHT	7 gms

ABSTRACT

Smart sanitizing device (SANDE) uses Arduino nano (AT mega 328) as it's microcontroller, the IR sensor used in this circuit detects any material that comes within its range and sends signal, which in turn closes the switch in the relay and as a whole turning on the circuit and the Sanitizer is dispensed out through submersible pump via tube and automatically stops after 2 seconds of detection of an object , thus pumps out only required amount of Sanitizer . This also sterilizes the objects kept inside the device by detecting the object through IR sensor and exposing UV light upon them. SANDE is totally automated , non-contact, low-cost and it can find its use in hospitals, workplaces and schools etc.

MATERIALS USED:

1. Arduino NANO
2. IR sensors
3. Bread board
4. Relay
5. Submersible water pump

1) ARDUINO NANO

Arduino is open - source platform used for building electronic projects , consists of physical programmable circuit (microprocessor ATmega328) and a software or IDE that runs the Arduino code on your computer , via USB connected to Arduino input pins. The code is written in C++ , also referred as sketches.

IR PROXIMITY SENSOR

IR sensor detects signals which are not noticeable by normal human eye, it is found in visible and microwave regions of electromagnetic spectrum. The emitter is simply an IR LED **(Light Emitting Diode**) and the detector is simply an IR photodiode. Photodiode is sensitive to IR light of the same wavelength which is emitted by the IR LED. When IR light falls on the photodiode, the resistances and the output voltages will change in proportion to the magnitude of the IR light received.

Range : 2 cm- 10 cm

Wavelength: 0.7 μm to 1000 μm

IR SENSOR consists of:

- IR transmitter and receiver pair
- Resistors of range in kilo-ohms
- Variable resistors
- LED

RELAY

Relay works on the principle of Electromagnetic induction. It aims at closing and opening the circuits electronically as well as electromechanically. It is used in circuits where only one signal can be used to control the circuit.

PARTS OF RELAY

1. Electromagnet
2. Movable Armature
3. Switch point contacts
4. Spring

WORKING:

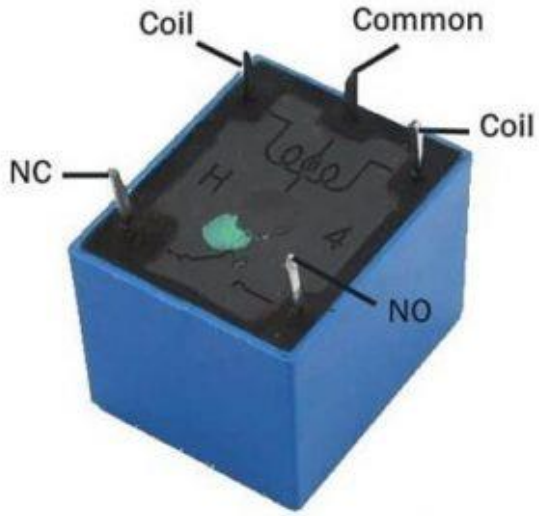
- It works on the principle of an electromagnetic attraction. When the circuit of the relay senses the fault current, it energizes the electromagnetic field which produces the temporary magnetic field. It has an iron core which is wound by a control coil.

- The power supply is given to the coil through the contacts of the load and the control switch. The current flowing through the coil produces the magnetic field around it. Due to this magnetic field, the upper arm of the magnet attracts the lower arm.

- Hence close the circuit, which makes the current flow through the load. If the contact is already closed, then it moves oppositely and hence open the contacts.

5V RELAY PIN CONFIGURATION

The pin configuration of the 5V relay is shown below. This relay includes 5-pins where each pin and its functionality are shown below.



Relay Pin Diagram

Pin1 (End 1): It is used to activate the relay; usually this pin one end is connected to 5Volts whereas another end is connected to the ground.

Pin2 (End 2): This pin is used to activate the Relay.

Pin3 (Common (COM)): This pin is connected to the main terminal of the Load to make it active.

Pin4 (Normally Closed (NC)): This second terminal of the load is connected to either NC/ NO pins. If this pin is connected to the load then it will be ON before the switch.

Pin5 (Normally Open (NO)): If the second terminal of the load is allied to the NO pin, then the load will be turned off before the switch.

SUBMERSIBLE PUMP:

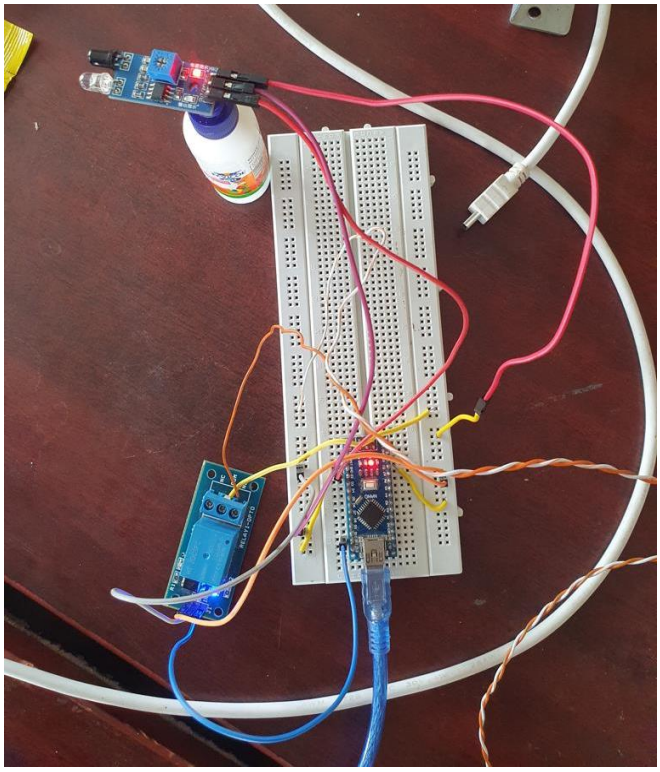
- A mini submersible water pump is a centrifugal water pump, which means that it uses a motor to power an impeller that is designed to rotate and push water outwards. The motor is located in a waterproof seal and closely connected to the body of the water pump which it powers.

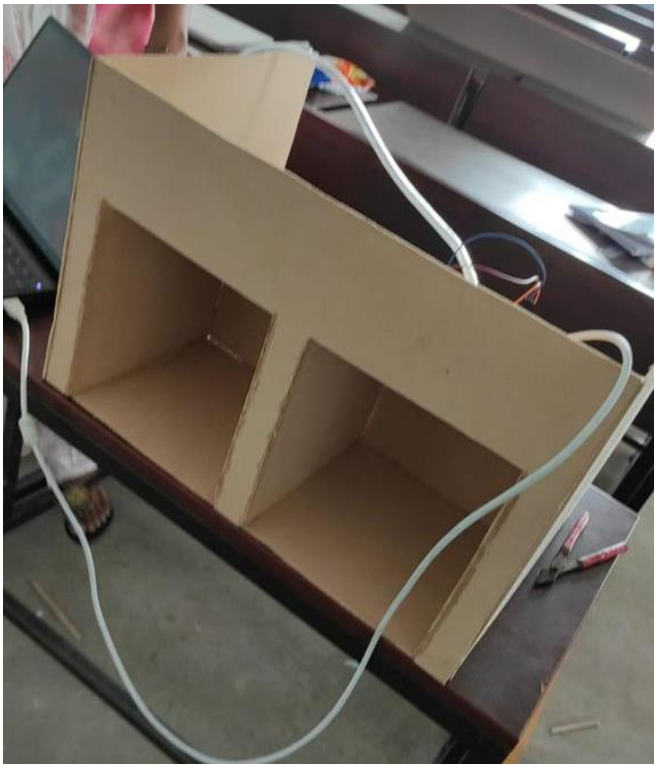
- This DC 3-6 V Mini Micro Submersible Water Pump is a low cost, small size Submersible Pump Motor which can be operated from a 2.5 ~ 6V power supply. It can take up to 120 liters per hour with a very low current consumption of 220mA. Just connect tube pipe to the motor outlet, submerge it in water and power it.

- Make sure that the water level is always higher than the motor. The dry run may damage the motor due to heating and it will also produce noise.

UV LIGHT STERILIZER

Ultraviolet radiation delivers maximum germicidal effectiveness to inactivate microorganisms when emitted at the optimal wavelength of 253.7 nanometer (nm), referred to as Ultraviolet germicidal irradiation (UVGI).UV light sterilization effectively inactivates microorganisms by damaging the DNA of cells. DNA is responsible for cell replication, thus damaging the structure of the DNA renders cells unable to replicate and unable to spread disease. The IR sensor fixed at the top will detect the objects and sterilizes them by exposing to UV radiation , thus minimizes the spread of disease.





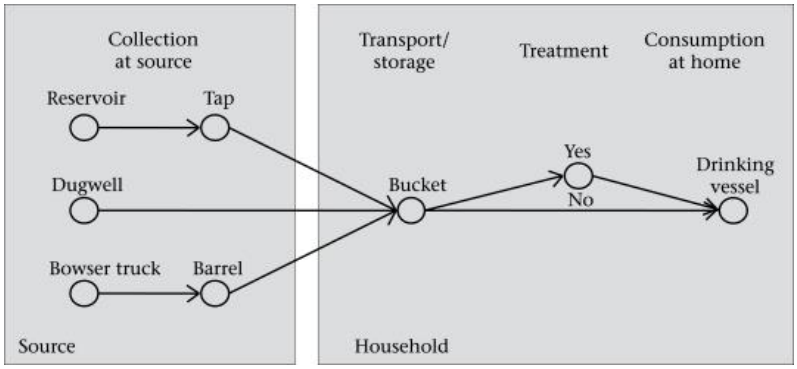
Do you think We can minimize disease spread due to contaminated drinking vessels in public places ?

17/03/2022

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

LITERATURE SURVEY

Every year, around 8,29,000 people including children die due to the disease spread from consumption of contaminated water which is easily preventable. The lack of proper sanitisation of drinking vessels and hands is a major reason for the contamination.



All these factors together create a fear among the people to consume water from the public sources through common vessels, as it may be contaminated. So, we have come up with an ideal solution for the above stated problems.

“

YOU CAN’T SOLVE A **PROBLEM** ON THE SAME LEVEL THAT IT WAS CREATED.YOU HAVE TO RISE ABOVE IT TO THE **NEXT LEVEL**.

- ALBERT EINSTEIN

SOLUTION

In order to prevent this issue and to make sure of the availability of hygienic water for everyone, we are proposing our idea through which we have come up with a safe system to provide portable water for everyone.

SWAD

Smart Water Dispenser

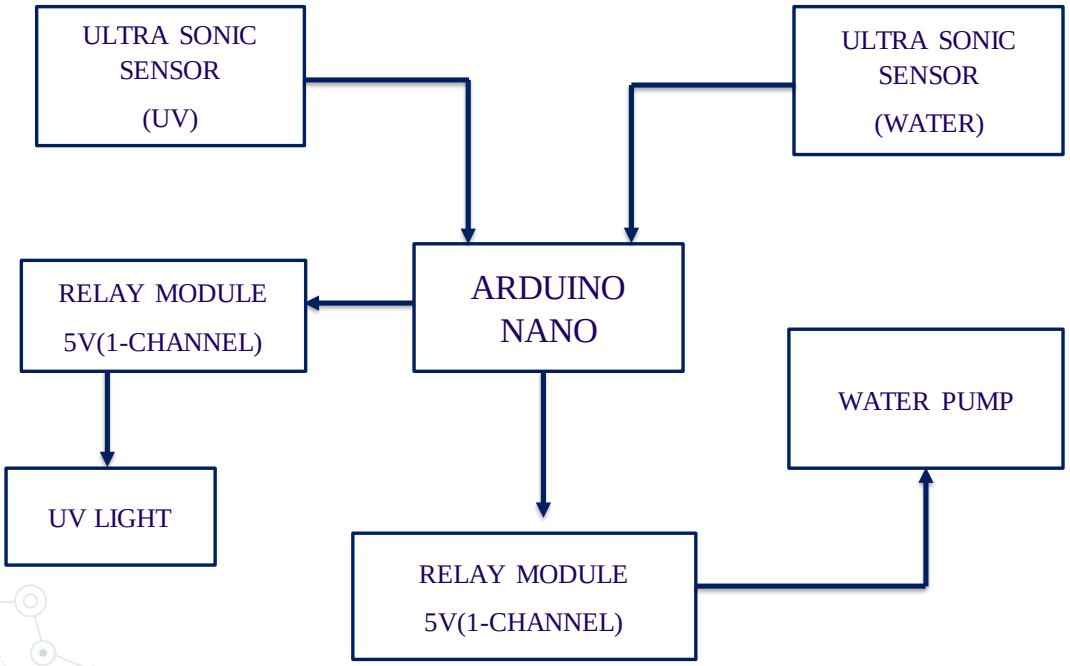
Team Members:

JAYACHANDAR P
ASHOK CHANDER S
KENNETH DAVE MATHEW J
VARSHAA K G
YAMUNAEASWARI M
SUMEETHANJALI A

ABSTRACT

SWAD (Smart Water Dispenser) is a revamped automatic water dispenser with enhanced UV sterilizing system that can rapidly disinfect containers or vessels which will make sure that people use sterilized materials for drinking. This can also sterilize mobile phones, purses, keys etc. This product will prevent the further spread of COVID, ensure safe drinking and help to reduce the loss of lives due to COVID-19.

BLOCK DIAGRAM



COMPONENTS

COMPONENTS	SPECIFICATIONS	QUANTITY
1. Arduino NANO	ATMEGA 328 P	1
2. Ultrasonic sensor	HC-SR04	2
3. DC-DC Buck converter	LM2596	1
4. Water pump	12V	1
5. Dc adapter	12V	1
6. LIPO battery	12V/1500mAh	1
7. Ultra violet	275nm	1
8. Relay	5V	2


SWAD
MSEC

WHY SWAD ?

(Smart Water Dispenser)

ADVANTAGES

- LOW-COST
- RELIABLE AND HANDY
- CONTACT-LESS
- LOW POWER CONSUMPTION
- BOTH BATTERY AND AC POWER OPERATED
- TWO DAYS BATTERY BACK-UP
- CUSTOMIZABLE

Target Customers

1. Industries, Companies
2. Local food shops
3. Educational institutions
4. Household customers
5. Orphanage and Care homes
6. Theaters, Malls, etc...

Smart Water Dispenser

Designed for:

Designed by:

Date:

Social Problem

Lack of proper sanitisation of drinking vessels in public is the reason for spread of many diseases.

Impact

It prevents contamination of diseases in public places and ensure safe, hygiene environment for future generation.

Key Partners

- Indus LED Chips Pvt. Ltd.
- Majestic Electronics
- Deccan Tracks Pvt. Ltd.
- Big Signs Pvt. Ltd.

Key Activities

- Installation
- Maintenance
- Promotion
- Extending our Network

Key Resources

- Financial Support
- Place for Installation
- Drinking Water Supply
- Electricity Supply

Value Propositions

- Provision of contact-less fresh water
- Disinfection of drinking vessels

Customer Relationships

- Contact through direct phone calls and e-mail
- Meeting people at the time of installation and maintenance

Channels

- Online web portals
- Social Medias

Customer Segments

- Schools and Colleges
- Care homes and Orphanages
- Malls and Tourist places

Cost Structure

Machine cost	INR. 3000/- per machine
Installation cost	INR. 100-500/- per machine
Electricity cost	INR. 100-500/- per year

Revenue System

Selling the machine	INR. 5000/- per machine
Customization and Upgradation	INR. 500-1000/- per machine
Maintenance after the warranty period	INR. 500-1000/- per machine

SWAD
MSEC

swadsbi@gmail.com

hod.ece@msec.edu.in

All educational courses should reach all students is our stand: CM

Inaugurates 'Societal Beneficial Innovation' scheme at Meenakshi College

Chennai, Feb 26:

Chief Minister M.K.Stalin today launched the 'Societal Beneficial Innovation' scheme at Meenakshi Sundararajan Engineering College, wish. I have told you about my wish, we shall work towards to achieve this, Chief Minister Stalin said.

References

1. https://www.arduino.cc/en/Guide/ArduinoNano/
2. https://components101.com/sensors/ir-sensor-module
3. https://www.geppowerproducts.com/standard-products/power-distribution-fuse-relay-holders-fuse-blocks/relay-modules/#:~:text=Relay%20Modules,-Request%20a%20Quote&text=A%20power%20relay%20module%20is,or%20close%20an%20electrical%20circuit.
4. https://datasheets.globalspec.com/ds/3935/KSB

Thanks!

Any questions?

Anando Bhramathi Vyajaanaath

ANANDAM

A FREE HOME FOR SENIOR CITIZENS

(A PUBLIC CHARITABLE TRUST)

Regd. No. 585/95

THE SECRETARY,
MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE,
363,ARCOT ROAD,KODAMBAKKAM,
CHENNAI-600 024

Respected Madam,

The product Smart Water Dispenser that was donated by your institution Meenakshi Sundararajan Engineering College in the month of February has been serving as a useful product for our oldage home and it is very covenient for our home to consume water with sterilized vessels . It is also very easy for us to use the product since its not that much heavy. We thank you for lending us such a great product and we look forward to a lot of innovative products in the upcoming days.

Hope we get a chance to meet every one of you in our home to spend an evening .

Thanks and regards,
Yours truly,

K.NARAYANAN
Trustee-Secretary
Mob:98410 01925

Regd. Office & Home : ***Anandam,*** *Anna Street, Gangai Nagar, Kallikuppam, Ambattur, Chennai - 600 053.*
Telephone No. : 2686 0099, 98418 19889, 98410 01925
E-mail : anandamtrust@yahoo.co.in Web : anandamoldagehome.org
80 G : DIT(E) No. 2 (290) / 95-96 PAN : AAATA1422A

SBI EEE DEPARTMENT

COMPLETE REPORT

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

#363, Arcot Road, Kodambakkam, Chennai - 600 024

Managed by IIET Society, Affiliated to Anna University, Approved by AICTE
Accredited by National Board of Accreditation for programs applied

SBI- Societal Beneficial Innovation

SMART STICK

Mano K

Final Year EEE, MSEC

Visually challenged persons find themselves very difficult to go out independently. To solve this problem and also to ensure their safety, we have developed a smart stick to make them self-reliant. This device is integrated with ultrasonic sensor which is controlled by Arduino Nano. The device senses the obstacles before them at a distance of 3 feet and alerts the user by giving a beep sound. The highlights of this product are compact in size, cost effective and portable, which provides a robust solution for the beneficiaries.

தடைகள் உணர்ந்து ஒலி எழுப்பும் கருவி

பார்வை குறைபாடு உள்ளவர்களுக்கு சுதந்திரமாக இயங்குவது என்பது பெரும் சவாலாக உள்ளது. எனவே பார்வை அற்றவர்கள் பாதுகாப்பாக இயங்குவதற்கு எங்களால் வடிவமைக்கப்பட்டதுதான் இந்தக் கருவி. மீயொலி எனப்படும் அல்ட்ராசவுண்ட் மூலம் இயக்கப்படும் இந்தக்கருவி. ஆர்டினோ நானோ மூலம் கட்டுப்படுத்தப்படுகிறது. இக்கருவியானது பார்வை அற்றவர்கள் எதிரில் வரும் தடைகளை மூன்று அடிக்கு முன்னரே உணர்ந்து எச்சரிக்கை ஒலி எழுப்பும் வண்ணம் வடிவமைக்கப்பட்டுள்ளது.

குறைந்த விலையும், சிறிய அளவும் வலுவான கட்டமைப்பும் கொண்டுள்ளதால் இந்த கருவியை பார்வையற்றவர்கள் எளிதில் பயன்படுத்தலாம்.

SMART BLIND STICK USING ATmega328P MICROCONTROLLER

The present invention generally relates to a system for visually impaired or blind people can walk independently without anyone's help. This invention automatically detects the obstacle in front of the person and gives a warning sound.

BACKGROUND OF THE INVENTION

Background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

As per the statistics provided by WHO, "Globally among 7.79 billion people living in 2020, an estimated 49.1 million were blind, 221.4 million people had moderate Visually impairment and 33.6 million people had severe Visually impairment". Visually impaired or blind people find themselves challenging to go out independently. In this technology-controlled world, where people strive to live independently, this invention proposes a blind stick for visually impaired or blind people to make them self-reliant.

The patent application number **202241003716** discloses the blind stick with no waterproof feature, but using this invention the user can able to use it during rainy season.

SUMMARY OF THE INVENTION

The present invention relates to automatically detect the obstacles in front of the person and gives a warning sound.

The salient features of this invention are compact in size, cost effective, rechargeable battery, waterproofing ability and support for portability which provides a robust solution for the Visually impaired or blind people.

After reading the following detailed description and accompanying drawings, persons with ordinary skill in the art will be able to identify other characteristics and benefits of the present invention that may not have been previously recognized.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings are included to provide a further understanding of the present disclosure and are incorporated in and constitute a part of this specification. The drawing illustrates exemplary embodiments of the present disclosure and, together with the description, serve to explain the principles of the present disclosure.

Figure 1 illustrates the simulation diagram of the present invention. It depicts the conceptual model that defines the structure and behaviour of the system. This disclosure comprises of all the components and its respective connections which forms an interlinked circuit that implements the assigned function.

Figure 2 illustrates the visualisation of how the present invention would resemble, and also contains the labelling of respective primary components.

DETAILED DESCRIPTION

The current disclosure comprises of Ultrasonic Sensor HC-SR04, Piezoelectric Buzzer, 9V Rechargeable Battery, IC 7805 Voltage Regulator, Arduino Nano (ATmega328P) Microcontroller, Portable box and Switch.

The Microcontroller 101 is a small, complete, flexible and breadboard-friendly development board, based on ATmega328P.The Microcontroller pinout contains 14 digital pins, 8 analog Pins, 2 Reset Pins & 6 Power Pins. It is the component which consists of all the loaded instructions for the device to perform the defined functions. It runs and controls all the instructions in the program sequentially to get the desired output.

Ultrasonic sensors 102 use sound waves to determine the distance between the sensor and the closest object in its path. The sensor sends an ultrasonic pulse out at 40kHz which travels through the air and if there is an obstacle or object, it will bounce back to the sensor. The sensor keeps track of the time elapsed between sending and receiving the sound waves. The trigger pin, which is used to send the waves is connected to D2, and echo pin, which is used to receive the waves is connected to D3 of the Microcontroller. In this invention, the ultrasonic sensor is placed at the bottom of the blind stick, i.e., 5cm from the tip of the stick. (Refer Figure 2)

Theoretically, the HC-SCR04 ultrasonic sensor works best between 2cm to 450cm distance with a sensing angle of 30degree cone coverage. Practically, it works best between 2cm to 100cm distance with a sensing angle of 30degree cone coverage.

Piezoelectric buzzer 103 is also connected to Microcontroller in which ultrasonic sensor's output is fed to that Microcontroller for creating a beep sound from the buzzer.

There will be no beeping sound from the buzzer if the measured distance is more than 100cm or 1m. But if it is less than 100cm the buzzer will start beeping. The beeping sound increases as the stick goes closer to the object.

All the above-mentioned components are placed inside a portable box which helps the user to attach and detach easily in the module into another stick using clamp and screws. The dimensions of this box are length: 8.8cm, height: 7.2cm, width: 3.2cm (l*h*w=8.8*7.2*3.2 in cm). This box is made by using a plastic material with IP66 waterproof rating which resists the water during rainy season.

Finally, it should be noted that the above embodiments are proposed to illustrate the present invention, not to limit the scope of the present invention, although the preferred embodiments are described in detail concerning the description of the present invention, those of ordinary skill in the art should be understood, modifications or equivalent alternates may be made to the present invention without departing from the scope of the technical solutions of the present invention.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this

specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

While the foregoing describes various embodiments of the invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof. The scope of the invention is determined by the claims that follow. The invention is not limited to the described embodiments, versions or examples, which are included to enable a person having ordinary skill in the art to make and use the invention when combined with information and knowledge available to the person.

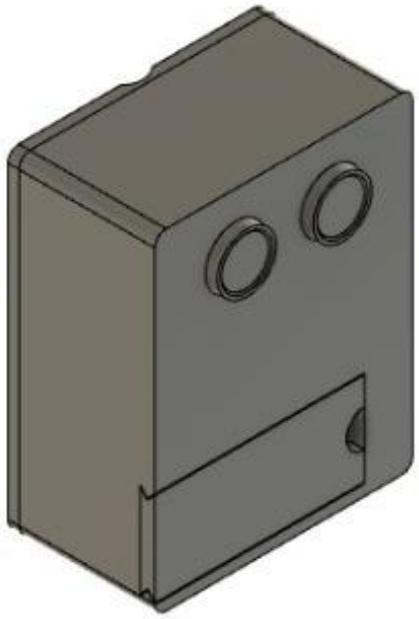
COST FOR MAKING 1 UNIT:

S.NO	COMPONENT	PRICE in Rupees
1	Blind Stick	350
2	Box	567
3	Bag & Sticker	12
4	Equipment	850
5	Clamp, Screw & Nut	33
TOTAL		**1812**

NO. OF. UNITS MADE: 50

COST OF MAKING 50 UNITS: 11812 x 50= 90600

PRODUCT DESIGN:



Title : SMART BLIND STICK USING ATmega328P MICROCONTROLLER

Applicant(s) Name: Dr. K.S. Babai et. al. Total No. of sheet(s) :02

Sheet No : 01 of 02

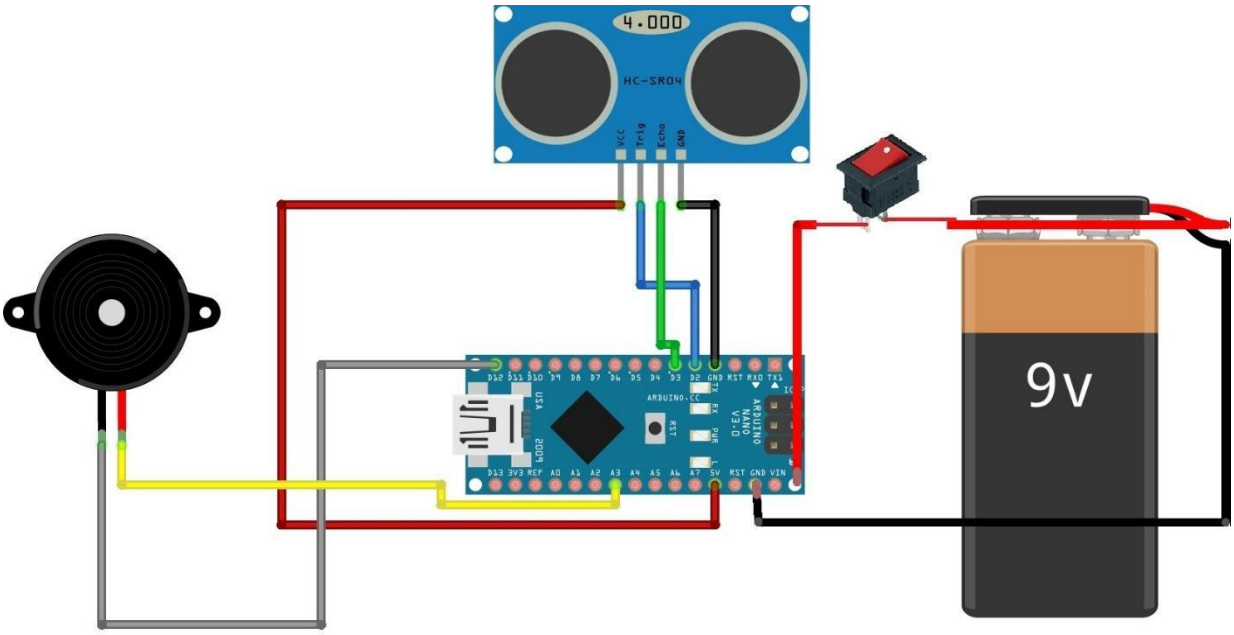


Figure 1: Simulation diagram of the invention

Dated this 20th of June 2022

Signature:

Applicant(s) Name: Dr. K.S. Babai et. al.

Title : SMART BLIND STICK USING ATmega328P MICROCONTROLLER

Applicant(s) Name: Dr. K.S. Babai et. al. Total No. of sheet(s) : 02

Sheet No. : 02 of 02

Figure 2: Smart blind stick using ATmega328P Microcontroller model

Dated this 20th of June 2022

Signature:

Applicant(s) Name: Dr. K.S. Babai et. al.

FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 **APPLICATION FOR GRANT OF PATENT** (See section 7, 54 and 135 and sub-rule (1) of rule 20)	(FOR OFFICE USE ONLY)
	Application No.
	Filing date: 17-06-2022
	Amount of Fee paid:
	CBR No:
	Signature:

1. APPLICANT'S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)

2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]

Ordinary (✓)		Convention ( )		PCT-NP ( )	
Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )

3A. APPLICANT(S)

Name in Full	**Nationality**	**Country of Residence**	**Address of the Applicant**
1. Dr. K. S. Babai	INDIAN	INDIA	The Secretary, Meenakshi Sundararajan Engineering College, Chennai-600024
2. Mrs. S. Soundara bala	INDIAN	INDIA	Associate Professor, Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
3. Mr. S. Manikandan	INDIAN	INDIA	Assistant Professor, Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
4. Mr. K. Mano	INDIAN	INDIA	Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
5. Mr. S. Soundar rajan	INDIAN	INDIA	Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024

3B. CATEGORY OF APPLICANT [Please tick (✓) at the appropriate category]			
Natural Person (✓)	Other than Natural Person		
	Small Entity ( )	Startup ()	Others ()

4. INVENTOR(S) [Please tick (✓) at the appropriate category]		
Are all the inventor(s) same as the applicant(s) named above?	Yes (✓)	No ()

If "No", furnish the details of the inventor(s)

Name in Full	Nationality	Country of Residence	Address of the Inventor
Same as Applicant			

5. TITLE OF THE INVENTION

"Smart Blind Stick using ATmega328P Microcontroller"

6. AUTHORISED REGISTERED PATENT AGENT(S)	IN/PA No.	
	Name	
	Mobile No.	
7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA	Name	Dr. K. S. Babai
	Postal Address	The Secretary, Meenakshi Sundararajan Engineering College, Kodambakkam, Chennai-600024
	Telephone No.	044-24801636
	Mobile No.	9841070913
	Fax No.	044-24811103
	E-mail ID	principal@msec.edu.in

~~**8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION**~~

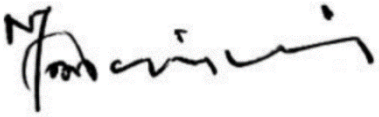
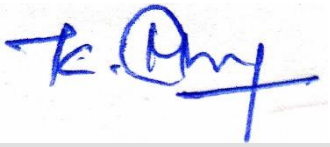
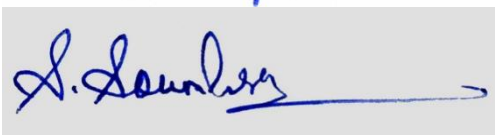
~~Country~~	~~Application Number~~	~~Filing date~~	~~Name of the applicant~~	~~Title of the invention~~	~~IPC (as classified in the convention country)~~

~~**9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)**~~

~~International application number~~	~~International filing date~~
~~10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16,~~	
~~PARTICULARS OF ORIGINAL (FIRST) APPLICATION~~	
Original (first) application No.	~~Date of filing of original (first) application~~
~~11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT~~	
Main application/patent No.	~~Date of filing of main application~~
12. DECLARATIONS	

(i) Declaration by the inventor(s)

(**In case the applicant is an assignee**: the inventor(s) may sign herein below or the applicant may upload the assignment or enclose the assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period).
I/We, the above named inventor(s) is/are the true & first inventor(s) for this Invention and declare that the applicant(s) herein is/are my/our assignee or legal representative.
(a) Date **20-06-2022**

(b) Name	(c) Signature
1. Dr. K. S. Babai	
2. Mrs. S. Soundara bala	
3. Mr. S. Manikandan	
4. Mr. K. Mano	
5. Mr. S. Soundar rajan	

(ii) Declaration by the applicant(s) in the convention country
(In case the applicant in India is different than the applicant in the convention country:
the applicant in the convention country may sign herein below or applicant in India may upload the assignment from the applicant in the convention country or enclose the said assignment with this application for patent or send the assignment by post/electronic transmission duly authenticated within the prescribed period)
I/We, the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative.
(a) Date
(b) Signature(s)
(c) Name(s) of the signatory

(iii) Declaration by the applicant(s)

I/We the applicant(s) hereby declare(s) that: -

- I am/ We are in possession of the above-mentioned invention.
- The provisional/complete specification relating to the invention is filed with this application.
- The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.
- There is no lawful ground of objection(s) to the grant of the Patent to me/us.
- I am/we are the true & first inventor(s).
- I am/we are the assignee or legal representative of true & first inventor(s).
- The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of my/our invention(s).
- I/We claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which I/We derive the title.
- My/our application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.
- The application is divided out of my /our application particulars of which is given in Paragraph-10 and pray that this application may be treated as deemed to have been filed on DD/MM/YYYY under section 16 of the Act.
- The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION
(a) Form 2

Item	Details	Fee	Remarks
Complete/ Provisional specification)#	No. of pages : 10		
No. of Claim(s)	No. of claims : 07 No. of pages : 02		
Abstract	No. of pages : 01		
No. of Drawing(s)	No. of drawings: 02 No. of pages : 02		

In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are required to be mentioned here.

(b) Complete specification (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).
(c) Sequence listing in electronic form
(d) Drawings (in conformation with the international application)/as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).
(e) Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service) if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.
(f) Translation of priority document/Specification/International Search Report/International Preliminary Report on Patentability.
(g) Statement and Undertaking on Form 3
(h) Declaration of Inventorship on Form 5

(i)Power of Authority
(j)**Total fee ₹…….in Cash/ Banker's Cheque /Bank Draft bearing No..... Date on ……. Bank.**
I/We hereby declare that to the best of my/our knowledge, information and belief the fact and matters slated herein are correct and I/We request that a patent may be granted to me/us for the said invention.
Dated this 20th Day of June, 2022.

Signature:
Name : Dr. K. S. Babai et. al.

To,
The Controller of Patents
The Patent Office, at Chennai

Note: -
* Repeat boxes in case of more than one entry.
* To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
* Tick ()/cross (x) whichever is applicable/not applicable in declaration in paragraph-12.
* Name of the inventor and applicant should be given in full, family name in the beginning.
* Strike out the portion which is/are not applicable.
* For fee: See First Schedule";

FORM 2

THE PATENTS ACT, 1970
(39 of 1970)
&
The Patent Rules, 2003
COMPLETE SPECIFICATION
(See sections 10 & rule 13)

1. TITLE OF THE INVENTION

Smart blind stick using ATmega328P Microcontroller

2. APPLICANT(S)

NAME	NATIONALITY	ADDRESS
1.Dr. K. S. Babai	INDIAN	The Secretary, Meenakshi Sundararajan Engineering College, Chennai-600024
2. Mrs. S. Soundara bala	INDIAN	Associate Professor, Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
3. Mr. S. Manikandan	INDIAN	Assistant Professor, Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
4. Mr. K. Mano	INDIAN	Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
5. Mr. S. Soundar rajan	INDIAN	Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024

3. PREAMBLE TO THE DESCRIPTION

COMPLETE SPECIFICATION

The following specification particularly describes the nature of the invention and the manner in which it is performed:

SMART BLIND STICK USING ATmega328P MICROCONTROLLER

FIELD OF INVENTION

[001] The present invention generally relates to a system for visually impaired or blind people can walk independently without anyone's help. This invention automatically detects the obstacle in front of the person and gives a warning sound.

[002]

BACKGROUND OF THE INVENTION

Background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[003]

As per the statistics provided by WHO, "Globally among 7.79 billion people living in 2020, an estimated 49.1 million were blind, 221.4 million people had moderate Visually impairment and 33.6 million people had severe Visually impairment".

[004] Visually impaired or blind people find themselves challenging to go out independently. In this technology-controlled world, where people strive to live

[005] independently, this invention proposes a blind stick for visually impaired or blind people to make them self-reliant.

[006]

The patent application number **202241003716** discloses the blind stick with no waterproof feature, but using this invention the user can able to use it during rainy season.

[007]

SUMMARY OF THE INVENTION

The present invention relates to automatically detect the obstacles in front of the person and gives a warning sound.

[008]

The salient features of this invention are compact in size, cost effective, rechargeable battery, waterproofing ability and support for portability which provides a robust solution for the Visually impaired or blind people.

[009] After reading the following detailed description and accompanying drawings, persons with ordinary skill in the art will be able to identify other characteristics and benefits of the present invention that may not have been previously recognized.

[010]

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings are included to provide a further understanding of the present disclosure and are incorporated in and constitute a part of this specification.

[011] The drawing illustrates exemplary embodiments of the present disclosure and, together with the description, serve to explain the principles of the present disclosure.

[012]

Figure 1 illustrates the simulation diagram of the present invention. It depicts the conceptual model that defines the structure and behaviour of the system. This disclosure comprises of all the components and its respective connections which forms an interlinked circuit that implements the assigned function.

[013]

Figure 2 illustrates the visualisation of how the present invention would resemble, and also contains the labelling of respective primary components.

DETAILED DESCRIPTION

The current disclosure comprises of Ultrasonic Sensor HC-SR04, Piezoelectric Buzzer, 9V Rechargeable Battery, IC 7805 Voltage Regulator, Arduino Nano (ATmega328P) Microcontroller, Portable box and Switch.

[014]

[015] The Microcontroller 101 is a small, complete, flexible and breadboard-friendly development board, based on ATmega328P.The Microcontroller pinout contains 14 digital pins, 8 analog Pins, 2 Reset Pins & 6 Power Pins. It is the component which consists of all the loaded instructions for the device to perform the defined functions. It runs and controls all the instructions in the program sequentially to get the desired output.

[016]

[017] Ultrasonic sensors 102 use sound waves to determine the distance between the sensor and the closest object in its path. The sensor sends an ultrasonic pulse out at 40kHz which travels through the air and if there is an obstacle or object, it will bounce back to the sensor. The sensor keeps track of the time elapsed between sending and receiving the sound waves. The trigger pin, which is used to send the waves is connected to D2, and echo pin, which is used to receive the waves is connected to D3 of the Microcontroller. In this invention, the ultrasonic sensor is placed at the bottom of the blind stick, i.e., 5cm from the tip of the stick. (Refer Figure 2)

[018]

[019] Theoretically, the HC-SCR04 ultrasonic sensor works best between 2cm to 450cm distance with a sensing angle of 30degree cone coverage. Practically, it works best between 2cm to 100cm distance with a sensing angle of 30degree cone coverage.

[020] Piezoelectric buzzer 103 is also connected to Microcontroller in which ultrasonic sensor's output is fed to that Microcontroller for creating a beep sound from the buzzer.

There will be no beeping sound from the buzzer if the measured distance is more than 100cm or 1m. But if it is less than 100cm the buzzer will start beeping. The beeping sound increases as the stick goes closer to the object.

All the above-mentioned components are placed inside a portable box which helps the user to attach and detach easily in the module into another stick using clamp and screws. The dimensions of this box are length: 8.8cm, height: 7.2cm, width: 3.2cm (l*h*w=8.8*7.2*3.2 in cm). This box is made by using a plastic material with IP66 waterproof rating which resists the water during rainy season.

Finally, it should be noted that the above embodiments are proposed to illustrate the present invention, not to limit the scope of the present invention, although the preferred embodiments are described in detail concerning the description of the present invention, those of ordinary skill in the art should be understood, modifications or equivalent alternates may be made to the present invention without departing from the scope of the technical solutions of the present invention.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

While the foregoing describes various embodiments of the invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof. The scope of the invention is determined by the claims that follow. The invention is not limited to the described embodiments, versions or

examples, which are included to enable a person having ordinary skill in the art to make and use the invention when combined with information and knowledge available to the person.

CLAIMS

We claim

1. Smart Blind Stick using ATmega328P Microcontroller; a system consisting,

   The invention to detect the obstacles in front of the stick holder at a distance of one meter and alerts the visual impaired person by giving a beep sound;

   The invention to attach and detach the module easily to the stick used by the visually impaired person using a clamp and screws;

   The invention containing a Ultrasonic Sensor HC-SR04, Piezoelectric Buzzer, 9V Rechargeable Battery,IC 7805 Voltage Regulator, Arduino Nano (ATmega328P) Microcontroller and a Portable box;

2. The system as claimed in claim 1, wherein, said Ultrasonic Sensor HC-SR04 perform the function of obstacle detection.

3. The system as claimed in claim 1, wherein, the invention is to alert the user by giving a beep sound using Piezoelectric Buzzer.

4. The system as claimed in claim 1, wherein, the invention is to power the entire system using 9V Rechargeable Battery supply.

5. The system as claimed in claim 1, wherein, the invention has an IC 7805 Voltage Regulator device which performs the conversion of 9V into 5V for giving power supply to the microcontroller.

6. The system as claimed in claim 1, wherein, said Arduino Nano (ATmega328P) Microcontroller is the integral part of the system and it controls all the components connected to it.

7. The system as claimed in claim 1, wherein, said Portable box contains the circuitry and protects it from water during rainy season with IP66 waterproof rating.

Dated this 20th of June 2022.

Signature:

Applicant(s): **Dr. K. S. Babai et. al.**

ABSTRACT

SMART BLIND STICK USING ATmega328

Visually impaired or blind people find themselves very difficult to go out independently. To solve this problem a smart stick is designed to make them self-reliant. This device is integrated with ultrasonic sensor which is controlled by Arduino Nano. This device senses the obstacles in front of them at a distance of 1 meter with a sensing angle of 30degree cone coverage and alerts the user by giving a beep sound. The salient features of this invention are compact in size, cost effective, rechargeable battery, waterproofing ability and support for portability which provides a robust solution for the users.

Dated this 20th of June 2022.

Signature:

Applicant(s): **Dr. K. S. Babai et. al.**

FORM 3
THE PATENTS ACT, 1970 (39 of 1970)
and
THE PATENTS RULES, 2003

STATEMENT AND UNDERTAKING UNDER SECTION 8
(See section 8; Rule 12)

<table>
<tr><td colspan="3">1. Name of the applicant(s).</td><td colspan="3">We, Dr. K. S. Babai et. al., all are citizen of India,
Address of one of the Applicant:
The Secretary,
Meenakshi Sundararajan Engineering College,
Chennai -600024</td></tr>
<tr><td colspan="3">2. Name, address and nationality of the joint applicant.</td><td colspan="3">(i) that ~~I~~/We have not made any application for the same/substantially the same invention outside India
Or
~~(ii) that I/We who have made this application No… dated alone/jointly with ……., made for the same/ substantially same invention, application(s) for patent in the other countries, the particulars of which are given below~~:</td></tr>
<tr><td>Name of the Country</td><td>Date of Application</td><td>Application No.</td><td>Status of the Application</td><td>Date of Publication</td><td>Date of grant</td></tr>
<tr><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="3">3. Name and address of the assignee</td><td colspan="3">(iii) that the rights in the application(s) has/have been assigned to …… none
……
…… that I/We undertake that upto the date of grant of the patent by the Controller, I/We would keep him informed in writing the details regarding corresponding applications for patents filed outside India within six months
from the date of filing of such application.
Dated this 20th day of June 2022.</td></tr>
<tr><td colspan="3">4. To be signed by the applicant or his authorized registered patent agent.</td><td colspan="3">Signature:
  </td></tr>
<tr><td colspan="3">5. Name of the natural person who has signed.</td><td colspan="3">Dr. K. S. Babai et. al.
Name of the Applicant(s)</td></tr>
<tr><td colspan="3"></td><td colspan="3">To
The Controller of Patents,
The Patent Office, at Chennai</td></tr>
<tr><td colspan="6">Note.- Strike out whichever is not applicable;</td></tr>
</table>

FORM- 5

THE PATENTS ACT, 1970
(39 of 1970)
&
The Patents Rules, 2003

DECLARATION AS TO INVENTORSHIP

[See Section 10(6) and Rule 13(6)]

1. NAME OF THE APPLICANT(S)
~~I~~/We **Dr. K. S. Babai et. al.,** all are citizen of India, Address of one of the Applicant:
The Secretary, Meenakshi Sundararajan Engineering College, Chennai -600024

hereby declare that the true and first inventor(s) of the invention disclosed in the complete specification filed in pursuance of my / our application numbered _____ dated **20-06-2022** ~~is~~/are

2. INVENTOR(S)

(a) NAME	(b) NATIONALITY	(c) ADDRESS
1. Dr. K. S. Babai	INDIAN	The Secretary, Meenakshi Sundararajan Engineering College, Chennai-600024
2. Mrs. S. Soundara bala	INDIAN	Associate Professor, Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
3. Mr. S. Manikandan	INDIAN	Assistant Professor, Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
4. Mr. K. Mano	INDIAN	Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024
5. Mr. S. Soundar rajan	INDIAN	Department of Electrical and Electronics Engineering, Meenakshi Sundararajan Engineering College, Chennai-600024

3. ~~DECLARATION TO BE GIVEN WHEN THE APPLICATION IN INDIA IS FILED BY THE APPLICANT(S) IN THE CONVENTION COUNTRY~~: -

N.A.

~~We the applicant(s) in the convention country hereby declare that our right to apply for a patent in India is by way of assignment from the true and first inventor(s).~~

Dated this **20th day of June 2022**.

Dr. K. S. Babai et. al.
Applicant(s)

To,
The Controller of Patents
The Patent Office, Chennai

FORM 9

THE PATENT ACT, 1970(39 of 1970)

&

THE PATENTS RULES, 2003

REQUEST FOR PUBLICATION

[See section 11A (2) rule 24A]

I/We **Dr. K. S. Babai, Mrs. S. Soundara bala, Mr. S. Manikandan, Mr. K. Mano, Mr. S. Soundar rajan** hereby request for early publication of my/our [Patent Application No.]

TEMP/E-1/39672/2022-CHE

Dated **20/06/2022 00:00:00** under section 11A (2) of the Act.

Dated this(Final Payment Date):----------

-

Signature

Dr. K. S. Babai

Name of the signatory

To,

The Controller of Patents,

The Patent Office,

At Chennai

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

DEPARTMENT OF EEE

SBI BENEFICIARY LIST

S.no	BENEFICIARY NAME	CLASS	SCHOOL NAME
1	N.Sahana	V	SETHU BHASKARA MAT HR SEC SCHOOL
2	.A.Pavithra	VI	
3	V.G. Poorvika	VI	
4	Mohammed Jameer	VII	
5	B.Thulasi	VIII	
6	R.Venkata lakshmi	VIII	
7	R.N.V. Navish	VIII	
8	M.Divakar	VIII	
9	B. Roshan Kumar	XI	
10	F. Praveen lawrence	XI	
11	S. Siva Parvathi	XI	

S.no	BENEFICIARY NAME	CLASS	SCHOOL NAME
1	Akash R	XII	GOVT HR SEC SCHOOL FOR THE VISUALLY IMPAIRED
2	Akash R		
3	Ayyappan M		
4	Dharesh B		
5	Dinesh S		
6	Gopinath P		
7	Gopinathan M		
8	Gunavarathan P		
9	Janakiraman I		
10	Kamalesh R		
11	Karthi A		
12	Karuppaiya E		
13	Kavin Kumar A		
14	Kishore Kumar Y		
15	Manikandan K		
16	Manikandan S		
17	Nandhosh Kumar S		
18	Pachaiyyappan M		
19	Paandithurai M		
20	Pandian E		
21	Pradeep E		
22	Purushothaman D		
23	SabariRajan R		
24	Sarathi M		
25	Srinath K		
26	Subash B		
27	Vignesh KU		
28	Vijay A		

SOCIETAL BENEFICIAL INNOVATION PROJECT REPORT

E-LEARNING PORTAL FOR HEARING IMPAIRED STUDENTS

ABSTRACT

Department of Information Technology

—

Meenakshi Sundararajan
Engineering College

- V.LOGESH
- R.GANESH KARTHIK

CONTENTS

S.NO	TITLE	PG. NO.
1	INTRODUCTION	3
2	ABSTRACT	4
3	INITIATION OF THE PROJECT	5
4	DEVELOPMENT OF PROTOTYPE	6
5	CONCLUSION	11

INTRODUCTION

The usage of technology within the educational department has become more vital by each year passing. One of the most popular technological approaches used is the e-learning environment. The usage of e-learning environment in education involves a wide range of types of students. But the usage of e-learning environment has always been a challenge for the hearing impaired ones. For that purpose, some adjustment or enhancement needs to be implemented within the e-learning environment, based on the needs or the adaptability of the hearing impaired students accordingly.

E-learning environment is one of the most used techniques for educational purpose especially during the COVID-19 pandemic. However, most e-learning environment available does not particularly can be useful to those students due to its feature which is lacking in terms of adaptability. Therefore, in order to assist these Hearing Impaired students in accessing the information adequately, the e-learning environment needs to be developed and designed according to the needs of them by adding or enhancing some features within the e-learning environment.

ABSTRACT

Technology can support in imparting knowledge to hearing-impaired students by means of visual interpretation of the contents and be supportive to the teachers in reaching out to them more effectively. This Learning Portal applies Speech Recognition techniques for transcribing the teacher's classroom lecture into textual content for the students to view, understand and also save for future reference. Images and related videos can be uploaded for better understanding. The learning portal also has a download button, which downloads the teachers lecture during the completion of the session, for the use of both teachers and students in future purpose.

The learning portal will help both students and teachers in a hearing impaired school as this was particularly developed for it. This will be helpful towards overcoming the sign language barrier for those hearing impaired students.

INITIATION OF PROJECT

After several brainstorming sessions by Department of Information Technology and, a thought of concept for hearing impaired students, as earlier we have planned the projects exclusively for physically challenged population, later on specifically we have planned to create a E-Learning Portal for Hearing Impaired Students and this idea was taken forward to the Secretary of the College to approve it under the Societal Beneficial Innovation (SBI) project.

FROM,

V.LOGESH,

R.GANESH KARTHIK,

DEPARTMENT OF INFORMATION TECHNOLOGY,

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE,

CHENNAI-600024.

TO,

THE SECRETARY,

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE,

CHENNAI-600024.

SUB: Request for approval of SBI Project reg.

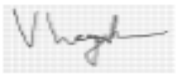
Respected Mam,

We, both students of this esteemed college have come up with an idea to make an learning portal for hearing impaired students, as of to increase their knowledge gain and reduce the limitations of their academic training, the project is named as "**E-Learning Portal for Hearing Impaired Students**", and we both seek approval from the management to proceed with the same under the "Societal Beneficial Innovation" event. We request you to review & approve our project and we assure to complete our project with our absolute best efforts.

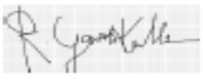
Encl.: Proposal of the project and the project estimation.

Thanking You!!

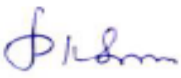
Yours Sincerely,



V.LOGESH



R.GANESH KARTHIK



PRINCIPAL

PRINCIPAL

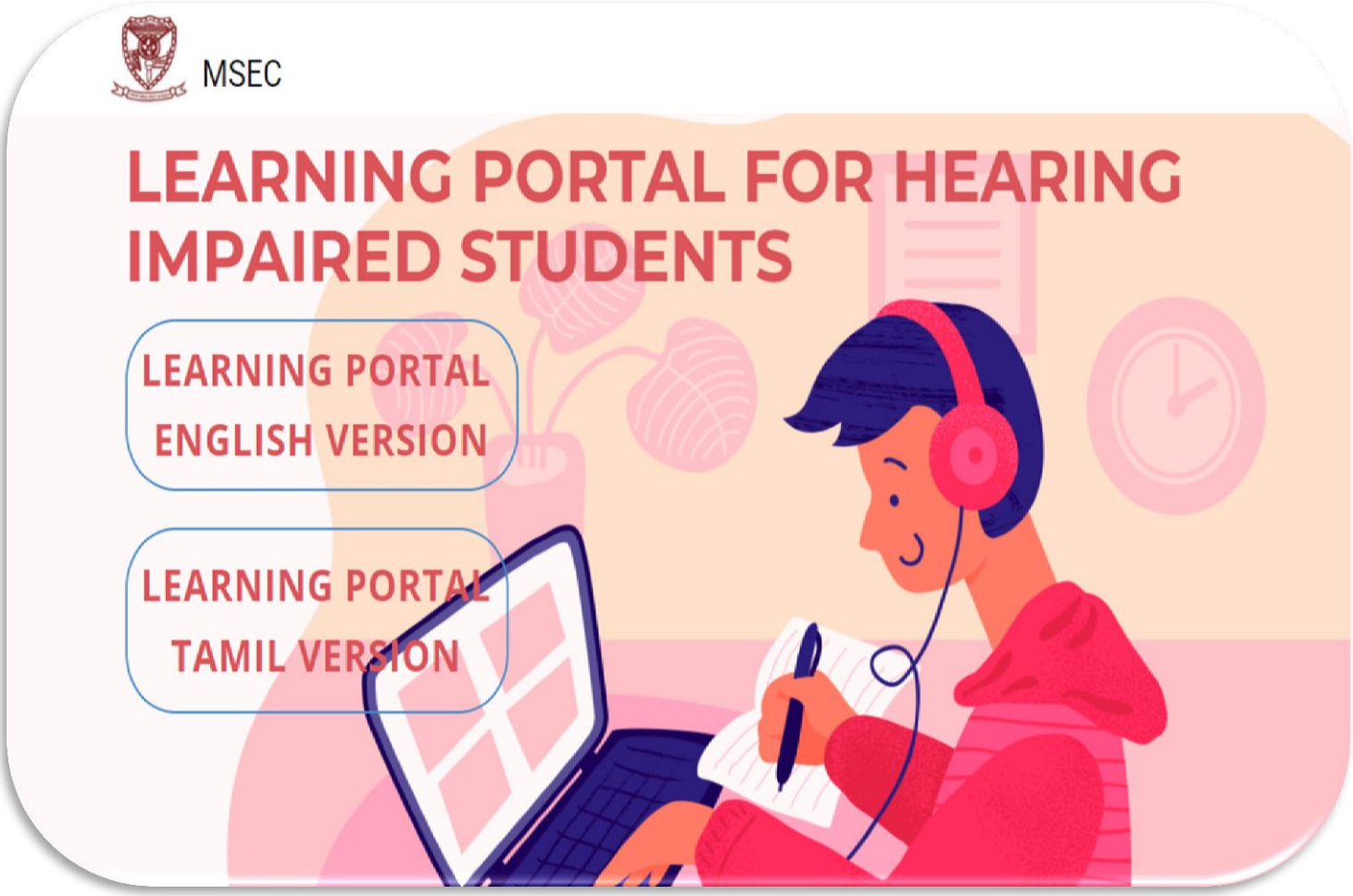
363, ARCOT ROAD, KODAMBAKKAM,

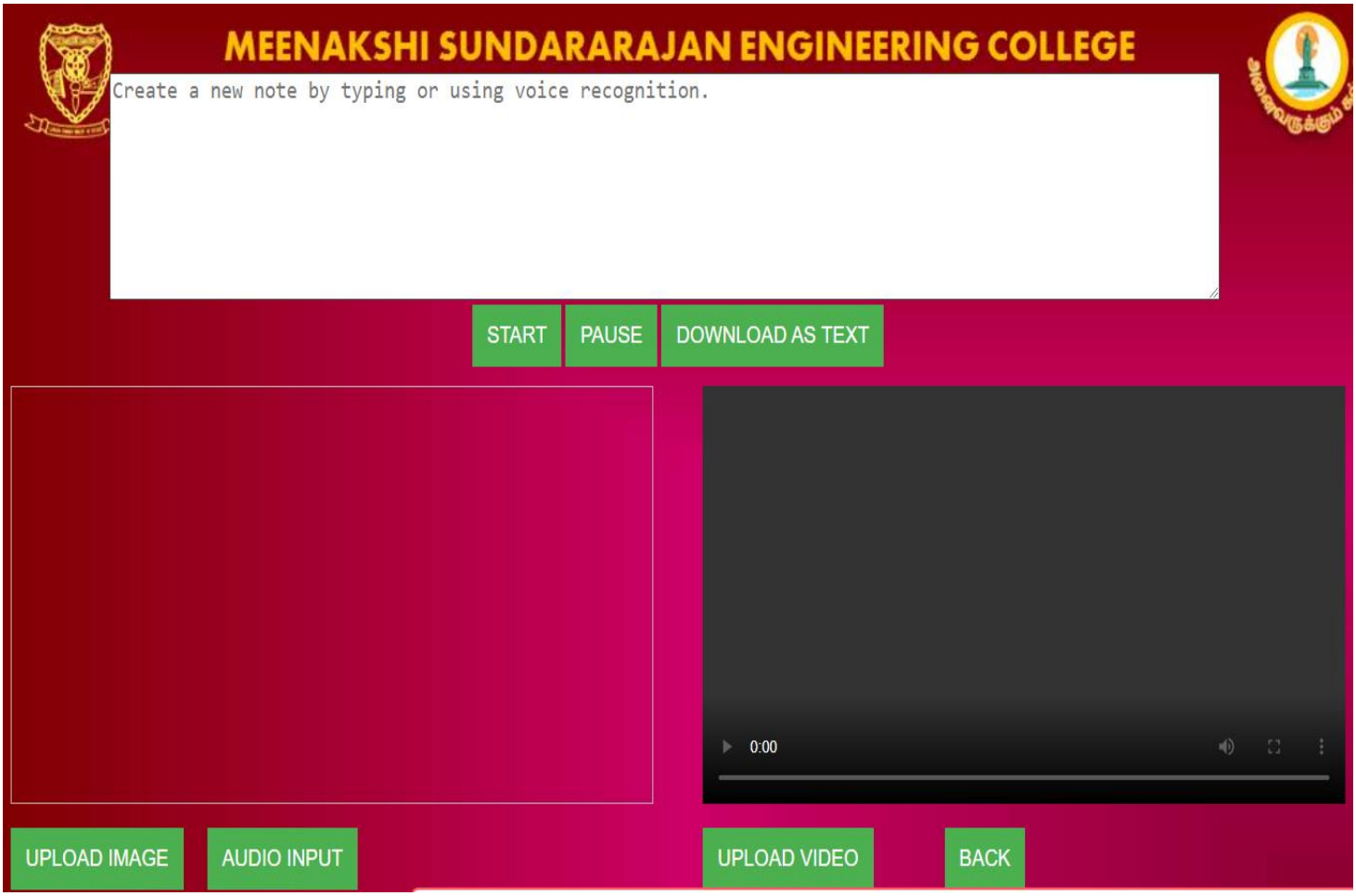
CHENNAI-600 024

DEVELOPMENT OF PROTOTYPE

PROTOTYPE I

After the approval of the project, creation of the first prototype design was initiated and was completed with several iterations. The design was then verified with the help of faculties in-charge and fabrication of the same was started.





Before the time of lecture, the teacher opts the required language to start his/her class. After choosing the required language, the teacher then, needs to upload the required image file and video file for the particular session. The image file can be uploaded in two ways. One is by clicking the upload image button, which redirects the system to the local directory where the image files are being stores. The second way is that the teacher can click the audio input button and can provide the name of the image through the microphone. This then displays the appropriate image file to the image block, which makes

it even more user friendly. The video file can be uploaded by clicking on the upload video button which redirects the system to the local directory where the video files are being stores.

When the teacher wants to start the class, he/she would need to enable the start the button, which converts the teacher's session contents into textual form and display it in the text area. For transcribing the audio content into textual form, SPEECH RECOGNITION techniques inside JQuery library are being used. When the teacher needs to stop or needed a break during the session, the teacher can use the pause button to pause the transcribing. The learning portal also has a download button, which downloads the teachers lecture during the completion of the session, for the use of both teachers and students in future purpose.

The learning portal will help both students and teachers in a hearing impaired school as this was particularly developed for it. This will be helpful towards overcoming the sign language barrier for those hearing impaired students.

REQUIREMENTS:

The initial requirements for the learning portal for work efficiently are as follows:

- A personal computer/laptop/smart board.
- Wired/wireless/in built microphone
- Internet facility

The model was successfully made and presented on 11.10.2021 to the Secretary and the faculty members and several improvements were suggested. These suggestions were noted and were executed in the next prototype.

REVISION 1

First the Trial version of the prototype is presented "**Little Flower Convent Higher Secondary School for the Deaf"**, T.Nagar, Chennai. Were the Staffs and teachers of the school provided a little more opinions and ideas which make our work easier and effective, as their guidance towards the project, makes us more confident on the usage of the application in the educational sector.

REVISION 2

The Second Trial and the improved version of the project is presented in **Dr.MGR Home & Higher Secondary School for the Speech & Hearing Impaired**, Ramapuram, Chennai.Here we are little more excited to present the project as we played a complete demo video and also presented a live demo for the teachers and faculties of the school, Which make a good impression and improvement of our project.


MGR

CONCLUSION

As our project is web based application, we hosted the project in the Web Hosting Panel ,as it focuses on more beneficiaries. An event for Societal Beneficial Innovation was organized on 26.02.2022 to launch the E-Learning Portal to the Hearing Impaired students by the Hon. Chief Guest, Thiru M.K.Stalin, Chief Minister of Tamil Nadu.

पेटेंट कार्यालय
शासकीय जर्नल

OFFICIAL JOURNAL
OF
THE PATENT OFFICE

निर्गमन सं. 19/2022	शुक्रवार	दिनांक: 13/05/2022
ISSUE NO. 19/2022	FRIDAY	DATE: 13/05/2022

पेटेंट कार्यालय का एक प्रकाशन
PUBLICATION OF THE PATENT OFFICE

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :26/04/2022

(21) Application No.202241024514 A
(43) Publication Date : 13/05/2022

(54) Title of the invention : System and method for visual rendering based learning aid for Hearing Impaired Students

(51) International classification :G10L0015260000, H04R0025000000, G09B0005000000, G06Q0050200000, G09B0005140000
(86) International Application No :PCT//
Filing Date :01/01/1900
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

(71)**Name of Applicant :**
1)BABAI K S
Address of Applicant :363, Arcot Road, Kodambakkam, Chennai -24 ---------- ----------
2)Dr. A. Kanimozhi
3)Dr. P. Chitra
4)Mrs. N.Mathangi
5)Mr. V.Logesh
6)Mr. R.Ganesh Karthik
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)BABAI K S
Address of Applicant :363, Arcot Road, Kodambakkam, Chennai - 24 ---------- ----------
2)Dr. A. Kanimozhi
Address of Applicant :Department of Information Technology, Meenakshi Sundararajan Engineering College, Chennai-600024 ---------- ----------
3)Dr. P. Chitra
Address of Applicant :Department of Information Technology, Meenakshi Sundararajan Engineering College, Chennai-600024 ---------- ----------
4)Mrs. N.Mathangi
Address of Applicant :Department of Information Technology, Meenakshi Sundararajan Engineering College, Chennai-600024 ---------- ----------
5)Mr. V.Logesh
Address of Applicant :Department of Information Technology, Meenakshi Sundararajan Engineering College, Chennai-600024 ---------- ----------
6)Mr. R.Ganesh Karthik
Address of Applicant :Department of Information Technology, Meenakshi Sundararajan Engineering College, Chennai-600024 ---------- ----------

(57) Abstract :
SYSTEM AND METHOD FOR VISUAL RENDERING BASED LEARNING AID FOR HEARING IMPAIRED STUDENTS
Learning environment for the hearing impaired students is more challenging. Hearing impaired students, commonly acquire the same level of mental capability as the normal hearing students in terms of learning ability and lack only in their hearing ability. This visual rendering based learning aid provides a computer based integrated learning environment through which the hearing impaired students can view, understand and learn the subjects. Classroom live lecture of the teacher is converted into text using speech-to-text conversion and displayed in the text frame; Images and videos related to the topic of discussion can be uploaded in the image and video frames to support the teacher to explain the topic with ease and to aid the hearing impaired students to understand the contents. This system supports multiple spoken languages that can be selected by the teacher for a particular session. Converted text and the associated summary generated by the system are saved in the database in text format for later reference by the teacher and the hearing impaired students. Students with hearing disability can understand and learn better with the assistance of visual aids.

No. of Pages : 21 No. of Claims : 10

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
(Managed by I.I.E.T Society)
363, Arcot Road, Kodambakkam, Chennai – 24

Department of Information Technology

AICTE LILAVATI AWARD 2021-2022

SUMMARY OF THE WORK:

Education is the foundation for the growth and development of any nation. Especially in a country like India with a population of more than 136 crores, education is the vital to improve the standard of living. Education must focus on educating the normal students as well as the students with physical challenges. Educating the visually impaired or a hearing-impaired student is still a challenge. Even though there are trained teachers who can able to communicate with them, it is still a challenge to transfer knowledge. Technology can support in imparting knowledge to these students by means of visual rendering of the contents. This Learning Portal for Hearing Impaired Students will transcribe the teacher's classroom lecture into a textual content. Students with hearing challenges will be able to view the text and understand the contents. Images and related videos can be uploaded in the portal during the session for better understanding. Textual contents of the classroom sessions can be saved in permanent storage for future references. Topic based summary generation is proposed as the future enhancement for this system. This portal will be convenient to the teachers in reaching to the hearing impaired students in a better way.

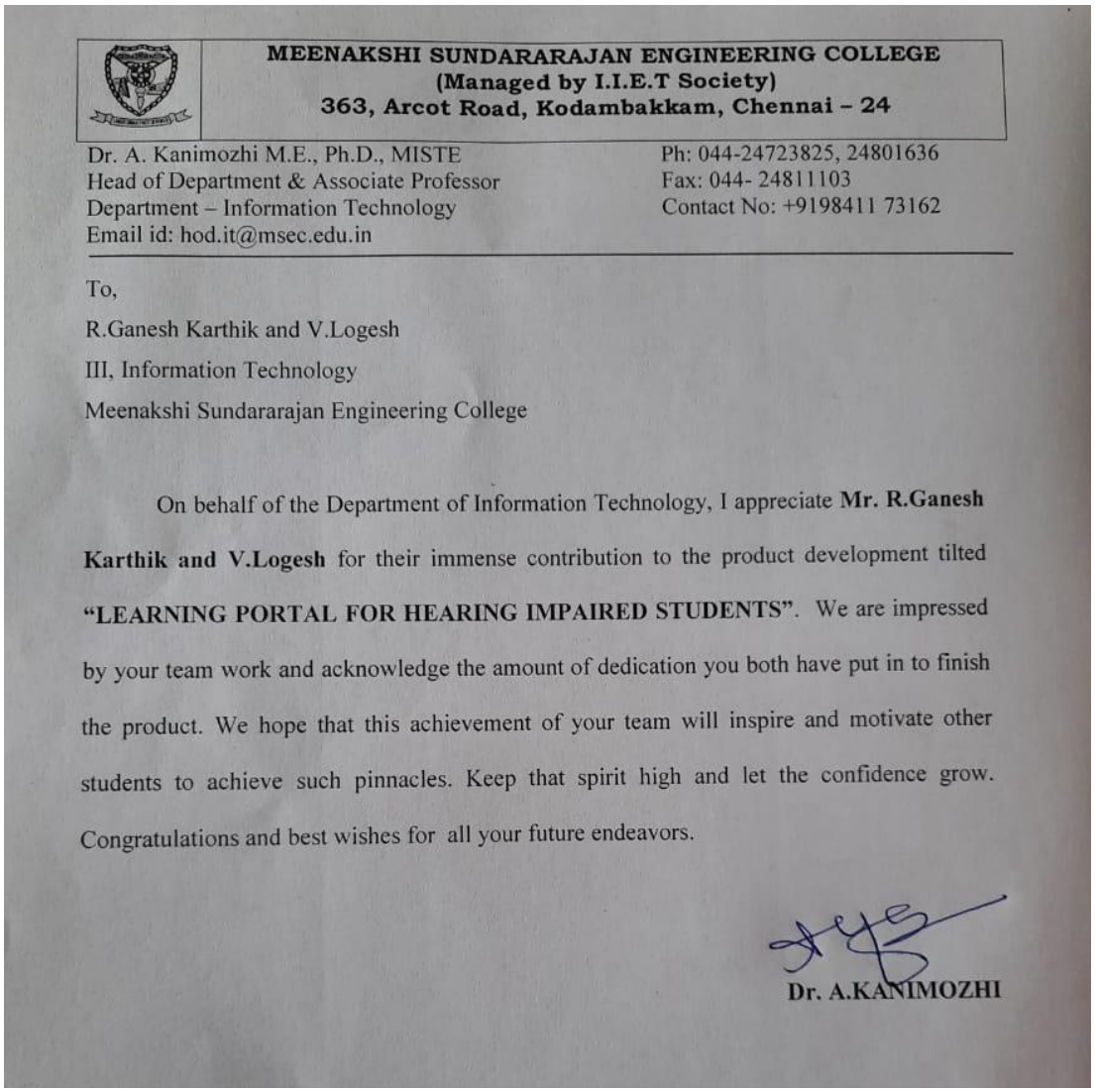
Relevance of the interventions/ programs/ activities to the mentioned sub-theme:

Technology supports in imparting knowledge to hearing-impaired students by means of visual rendering of the contents. This Learning Portal will transcribe the teacher's classroom lecture into a textual content for the students to view and understand the contents and can be saved for future reference. Images and related videos can be uploaded during the session for better understanding. This portal will be convenient to the teachers in reaching to the hearing impaired students in a better way.

No of Women benefited:

This product was demonstrated to 30 girls students in a school that runs to impart education exclusively for hearing impaired students

APPRECIATION LETTER:



MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE
(Managed by I.I.E.T Society)
363, Arcot Road, Kodambakkam, Chennai – 24

Dr. A. Kanimozhi M.E., Ph.D., MISTE
Head of Department & Associate Professor
Department – Information Technology
Email id: hod.it@msec.edu.in

Ph: 044-24723825, 24801636
Fax: 044- 24811103
Contact No: +9198411 73162

To,

R.Ganesh Karthik and V.Logesh

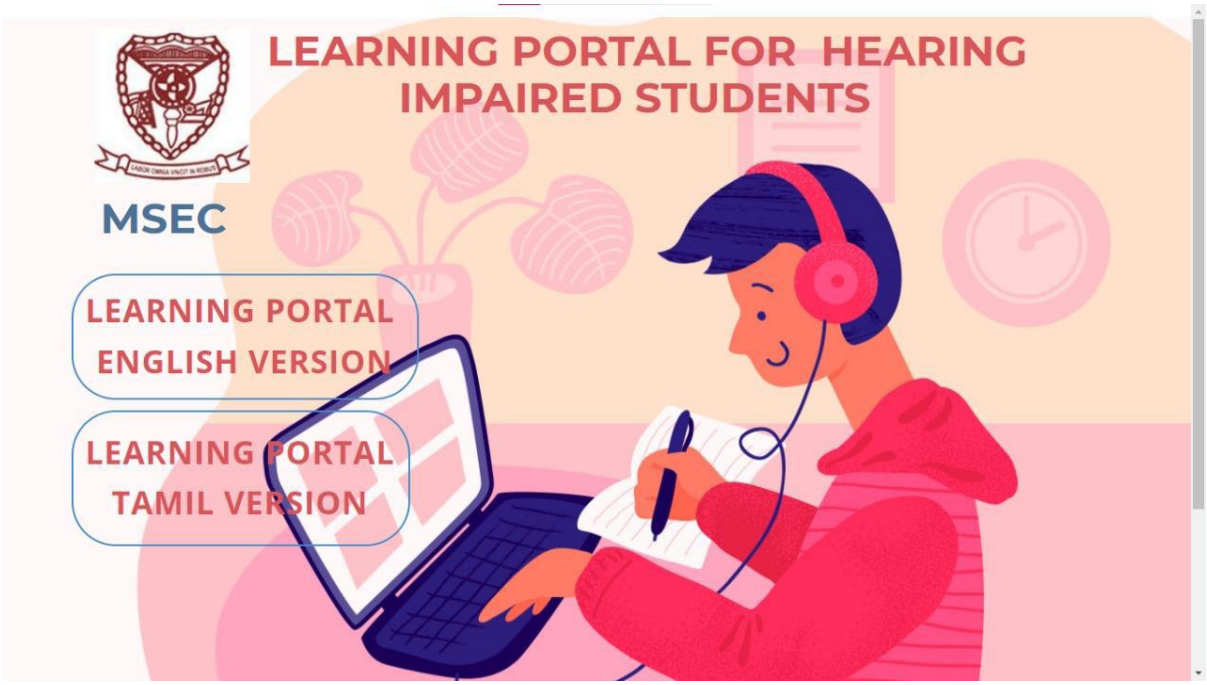
III, Information Technology

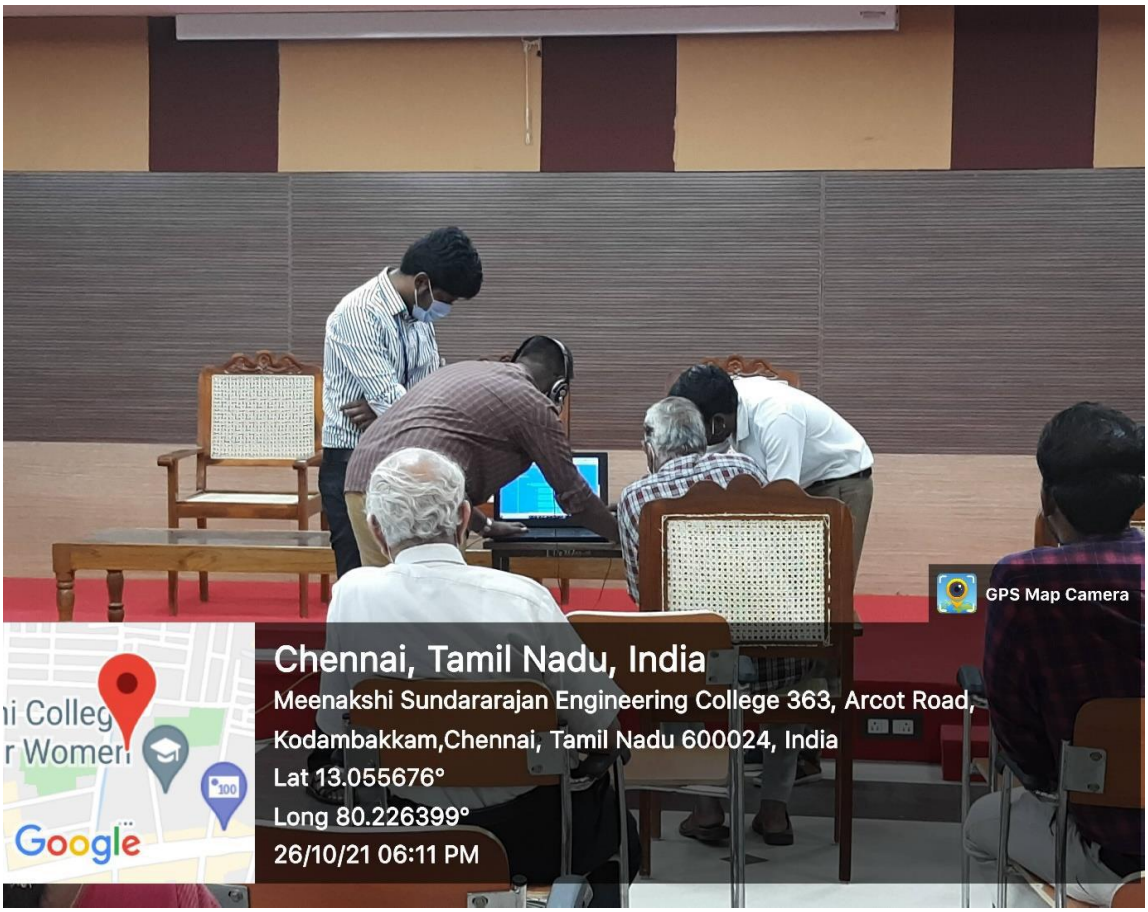
Meenakshi Sundararajan Engineering College

On behalf of the Department of Information Technology, I appreciate **Mr. R.Ganesh Karthik and V.Logesh** for their immense contribution to the product development tilted **"LEARNING PORTAL FOR HEARING IMPAIRED STUDENTS"**. We are impressed by your team work and acknowledge the amount of dedication you both have put in to finish the product. We hope that this achievement of your team will inspire and motivate other students to achieve such pinnacles. Keep that spirit high and let the confidence grow. Congratulations and best wishes for all your future endeavors.

Dr. A.KANIMOZHI

LEARNING PORTAL FOR HEARING IMPAIRED STUDENTS






GPS Map Camera
Chennai, Tamil Nadu, India
MeenakshiSundararajanEngineeringCollege 363, Arcot Road,
Kodambakkam,Chennai, Tamil Nadu 600024, India
Lat 13.055676°
Long 80.226399°
19/10/21 05:00 PM
Google
Arcot Rd


DR MGR HOME & HIGHER SECONDARY SCHOOL
FOR THE SPEECH AND HEARING IMPAIRED

MEENAKSHI SUNDARARAJAN ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION TECHNOLOGY