

UV Sanitizing System Sanifit

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Abstract:- We wash our hands to maintain hygiene and for prevention from diseases, and especially we follow this routine frequently in this era because of the very recent COVID-19 pandemic that we have experienced. The novel corona virus is transmitted from one infected person to another, as they come in contact with various people. This new virus survives on various surfaces, but they can be destroyed with sanitizing products. It is mandatory that people remember the significance of effective cleaning and sanitization of surfaces, also the various surfaces and objects touched by people, so that we could prevent the spread of this infectious disease. For example, almost all people working in various sectors including jobs, daily chores, shopping, etc. need to remain hygiene which is mandatory. For this reason, various sanitizing devices and systems have been created for disinfection of hands and objects. So, in these circumstances we want to integrate a sensor-based solution which will act as a disinfectant and sterilizing agent. For example, In the case of driving, we need to sanitize the steering wheel, but instead of this, killing the bacteria and germs using this device would be a better solution. So, in the given context, we thought out of box and worked on this new technology with some creative innovation like UV lamps, sanitizer, etc. We are trying to combine this solution which is innovative as well as it will also be portable so that we could carry it to wherever we go.

Keywords:- COVID-19; Sanitization; UV Lamps; Objects.

I. INTRODUCTION

Globally, millions people still open defecate, billions of people lack access to basic sanitation that leads to growing of viruses and bacteria which eventually contributes in spreading various kinds of diseases. To prevent the spread of infections especially COVID-19, one should regularly clean the objects and surfaces that are often touched. As, it is important to remember to effectively and promptly clean and disinfect hands similarly sanitizing surfaces including objects is of utmost importance, to prevent the spread of contagious diseases. UV-C radiation technique is a disinfectant new technology that can kill a wide array of microorganisms including vegetative and spore forming pathogens. The technology is getting more affordable and has produced consistent reproducible significant reduction of bacterial

pollution. However, all the cleaning devices and systems developed so far are highly expensive as well as bulky. Hence, a new sterilizing device is put forward, which is a portable light weight device that provides automatic sanitization. This helps to demote the spread of various different diseases or pandemics, hence promotes germ-free and clean environments. The suggested concept involves a device disinfection of objects as well as surface areas touched by the user. Thus, device will be composed of a wristband or watchstrap that can be worn out on the wrist. It will consist of an ultraviolet source with a considerable degree of radiation, so that the entire area of touch is sterilized.; Ultimately, this wristband will be enabled with a tilt sensor that will cause on/off function of the device by the power switch button. The gadget will be assembled with an electronic control unit that will be integrated in the UV emitting head, that will shoot up or reduce the intensity of UV radiation and the period of this emission of radiation on the person's hand.

II. OBJECTIVES

The main goal of this research paper is to create and execute a portable lightweight device which offers automatic, integrated and autonomous disinfection for various objects and areas.

- To design low-cost UV sterilizer.
- To remove and destroy potentially harmful microorganisms by UV rays.
- To render the areas socially clean in order to continue the delivery of health care.

III. STRUCTURE INTERPRETATION

In this research paper, UVC Sensor is used to kill the bacteria. When it detects the presence of hand below 10cm, it will trigger the tilt switch sensor at specified 0 degrees to 180 degrees. It will operate and disinfect the selected area. We are using three UVC LEDs and two UV contribute LEDs for sterilization. A lithium polymer battery of 3.3V 800 mAh is used, therefore we need to charge it below 800mah so tp4056 comes into consideration , ic have floating charge voltage and programmable current(adjustable current mode)which has limit to 3.3v only, but the power of the uvc consist 6v so mt3608(step up ic)is used to convert the 3.7v battery voltage

to 6v ,the output voltage can be fixed with feedback i.e. feedback resistors ,and fs8205 and dwo1 are used as battery protection which maximize the voltage to 4.2v (full charge)or also considered as threshold voltage with maximum drain level about 2.8v. Tilt switching contains two things one is tilted switch and another is mosfet. The mosfet gate is connected with voltage divider because gate supply should be between 0.5v to 2 v.

The product comprises of two different parts, Hardware and Software.

A. The Hardware parts involves following:

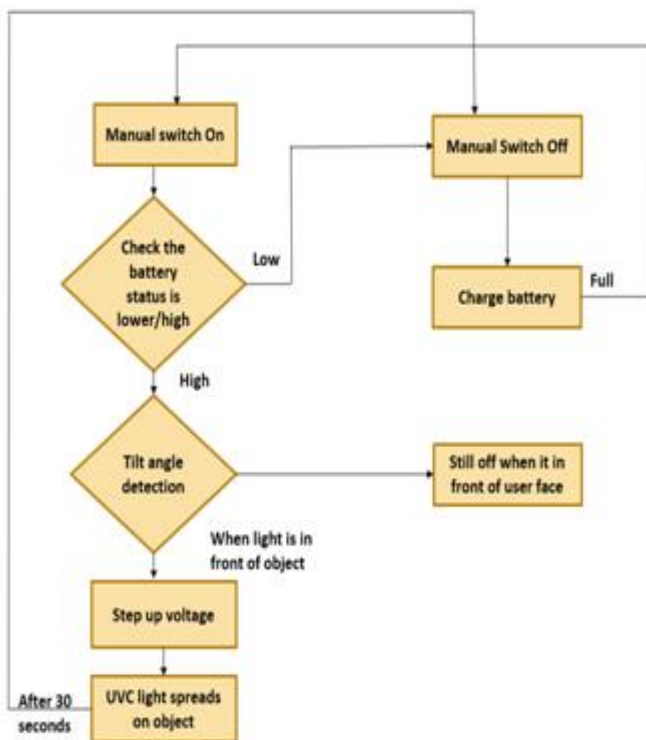
- Tp4056: charging unit
- Tilt switch sensor
- MT3608: voltage booster UV Sterilization
- UV lamps
- Resistors

B. The Software part involves following:

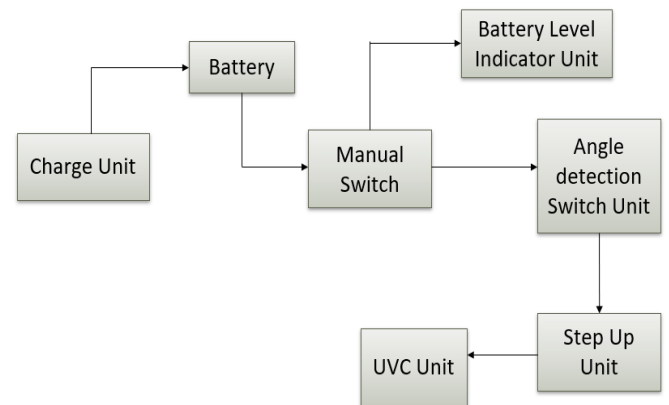
- NI Software (Multisim and Ultiboard)
- Arduino IDE
- Catia

Divided into following sections:

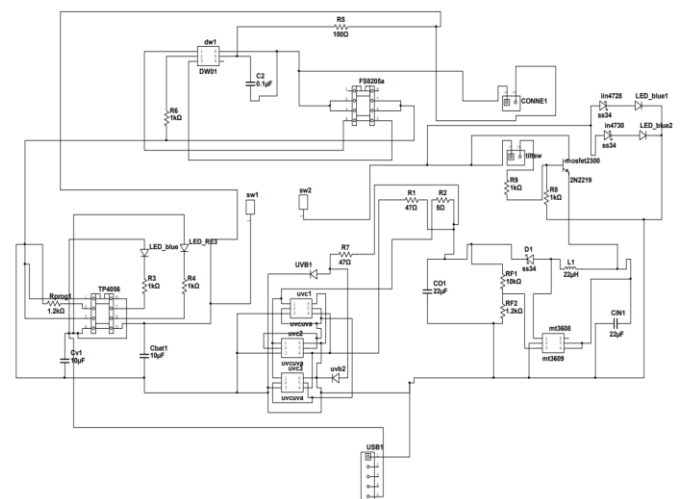
i. FLOWCHART



ii. BLOCK DIAGRAM



iii. CIRCUIT DIAGRAM



iv. STRUCTURE

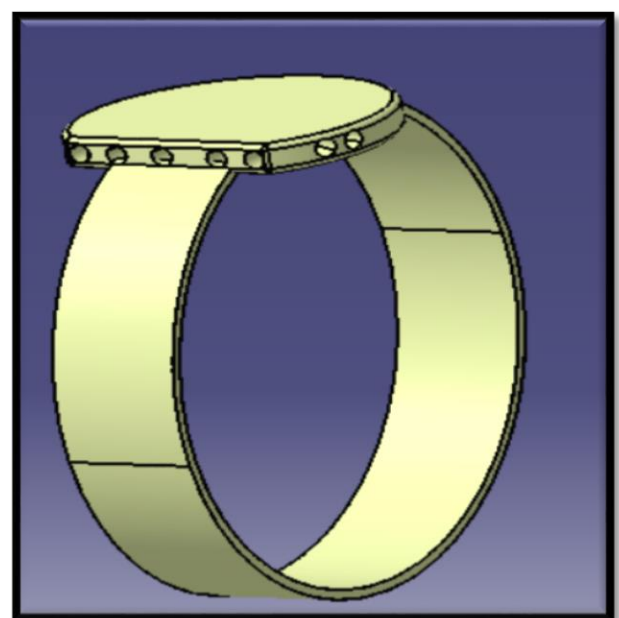


Fig: 1

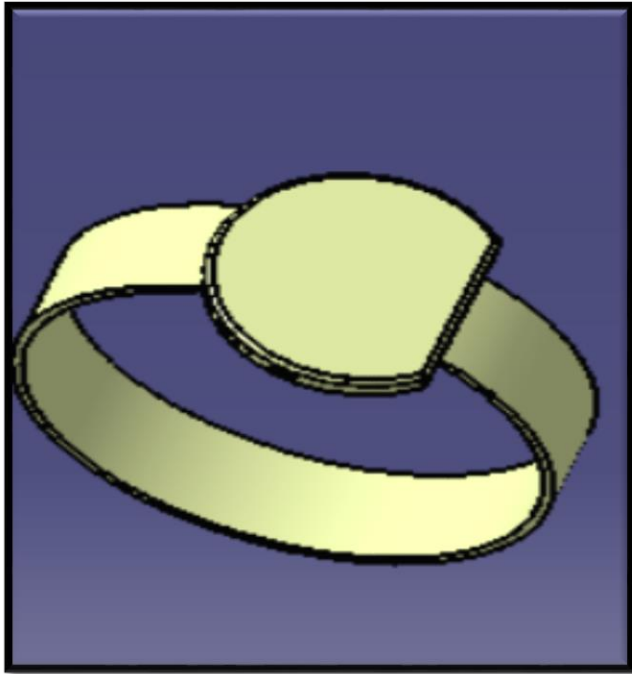


Fig: 2

IV. APPLICATIONS

To eliminate pathogens from hand touch surfaces, UV disinfection technology can be incorporated at:

- Disinfect public transport such as city buses, passenger trains, airplanes, etc.
- Disinfect shared taxi services, such as Ola, Uber, and personal vehicles frequently.
- Disinfect shops in vegetable markets.
- Disinfect hospitals, office premises, malls etc.
- In Restaurants, for disinfecting seating places and kitchen areas and sanitizing locker rooms and benches in schools.
- Useful in food preparation and processing areas, Detention centers also veterinary clinics and areas.

V. FUTURE SCOPE

- 1). We can make it detachable so that it can be attached to regular wristwatch or any other object which will act as an extra feature.
- 2). Further compacted, miniaturized versions of the device can also be designed
- 3). The wristband can be fitted with an optional watch so that it has a compact, elegant, and practical shape.
- 4). The Working time of the wristband can be increased.

VI. CONCLUSION

We present an eye-catching chance to bring new solutions for UV disinfection systems. This product will sterilize all objects easily that are being touched by the living beings, as the UV rays will be bombarded on the objects. The epidemic crisis related to COVID'19 had a significant impact on stimulating the progress of innovative solutions and bring out new researches. This product is much safer and advised because of its touch-less property which decrease chances of contamination. Our goal is to provide an advanced, modest solution device that can effectively contribute to addressing today's sanitary challenge.

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