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Design of Currency Sanitizer using UV-C Light

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Abstract: ***Currency is the primary mode of transmission of microbes and infection. Currency sanitization is a simple and least expensive means of preventing infection. Various sanitizing products are on the market in the form of antimicrobial and alcohol-based sanitizers which are meant to reduce/remove microbial load of the skin. The UV-C currency sanitizer is one of the best sanitizer for currency sanitization. This paper provides information about the Design of Currency Sanitizer Using UV-C Light. It is simple a currency sanitizing device which use ultraviolet–C type light of wavelength (254nm) to sanitize the currency surface. In which 254nm wavelength two 4w of light has used for sanitization the highest disinfectant capacity.***
Keywords: Currency Sanitization, UV-C light.

I. INTRODUCTION

UV-C light is using to reduce the risk of virus and bacteria transmission in its workspace. Also it disinfect the wide range of area. Generally in villages it is observed that people are unaware about digital payment so in that region it will be use effectively. By using ultraviolet light (Ultraviolet C), 99% bacteria, virus and mold can be effectively killed or inactivated , the effect is stronger and faster. UV-C currency sanitizer is a fluid less device which can be used to perform the disinfection of various bacteria and viruses, it is based on UV-C light technology. UV disinfection does, however, provide many benefits over chemical options. It cannot be overdosed, and does not produce by-products, toxins, or volatile organic compound (VOC) emissions. It does not require the storage of hazardous materials, and will not affect smell or taste in water and food disinfection applications. In addition, UV light is known to kill more waterborne microbes than chlorination. It is provides a portable ultraviolet disinfecting device for currency notes which comprises an acrylic case,. The light are arranged in the top and bottom and inner layer coated with aluminium foil to increase the utilization of light rays. The portable ultraviolet disinfecting device for currency is small in size, simple in structure and easy to use.

II. CIRCUIT DIAGRAM

According to Circuit Diagram, the continuous power supply to the various components like UV choke, Motors, Touch Sensors, Power Supply , Relay, Relay Module, etc. Main supply is connected with DC power supply (5V) and UV Choke, the UV choke is connected to the UVC light (4w each), and the main supply is connect to the power supply which is connect to the relay module and then Touch sensor the same supply is connect to the two motor.

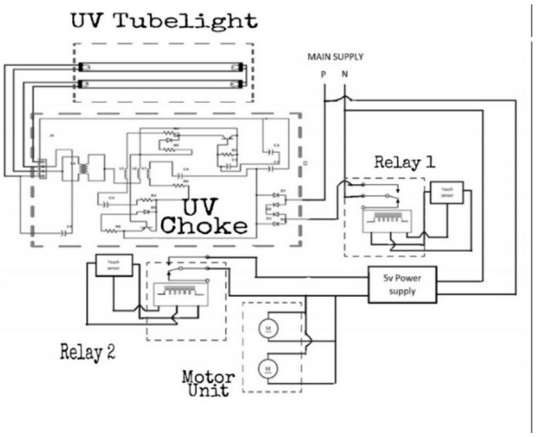

Fig. 1 Circuit Diagram

In main supply there is relay module and touch sensor is connected the touch sensor is acts as a starting as a ON/OFF switch. Here 230v ac supply is provided to power supply unit and UV Choke. Power supply unit convert the 230v ac to 5v dc which is required for the working of relay module, touch sensor and motor. When touch sensor is activated by user the device will on and turn on the UV-C light through relay. When currency inserted in device it sense and activate the motor which rotate the roller and currency pull inside and go for sanitization. After sanitization back roller push the currency outside of device.

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There are 2 relay, one is connected with UV-C tube light and other with motor. The relay 1 will start the tube light and relay 2 will start the motor. Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. Here, Relay is used to switch the UV lights with separate power. UV choke provide a proper supply to the UV light so that it produce UV-C light of wavelength 275nm. UV choke is design to provide all power for residential UV purification with high frequency switching technology. An electronic ballast (or electrical ballast) is a device which controls the starting voltage and the operating currents of lighting devices.

III. DESIGN

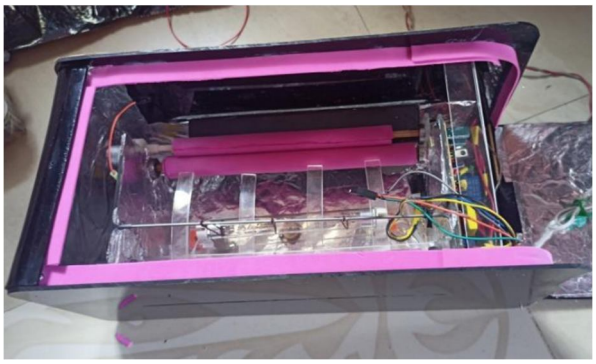

Fig. 2 Design Of Currency Sanitizer Using UV-C Light

There are 4 pink coloured tubes connected to motors for getting grip. In the bottom we will place the UVC light tube. The rectangular 4 plates connected in middle will support the currency to pass smoothly through tubes. The spring structure helps currency not to get folded or block in the process. On the right there is a power circuit to control the system. The power circuit has UV choke connection which gives proper supply to the UVC light. Two UVC used connected in upper and lower side of roller for the more UV dose. Two UV-C light tubes connect to UV choke and it connected with relay when we put the currency note, it will detect by IR sensor. The ir sensor will give signal to start the light and motor then relay will start the motor and UVC light tube. Then UVC light will disinfect bacteria and virus present on the currency by attacking their DNA. The distance between UV light and roller is less for the decrease the time for sanitization of the currency.

IV. ADVANTAGE

A. UV light disinfection is an extremely effective form of disinfection.
B. Less maintenance cost due to very few moving parts present.

V. DISADVANTAGE

Leakage of UV light cause skin diseases and cataract.

VI. CONCLUSION

Recent developments in the technology are making life easier. This paper explain Design of currency sanitizer using UV-C light. The real time sanitization for the reduce of time as possible.

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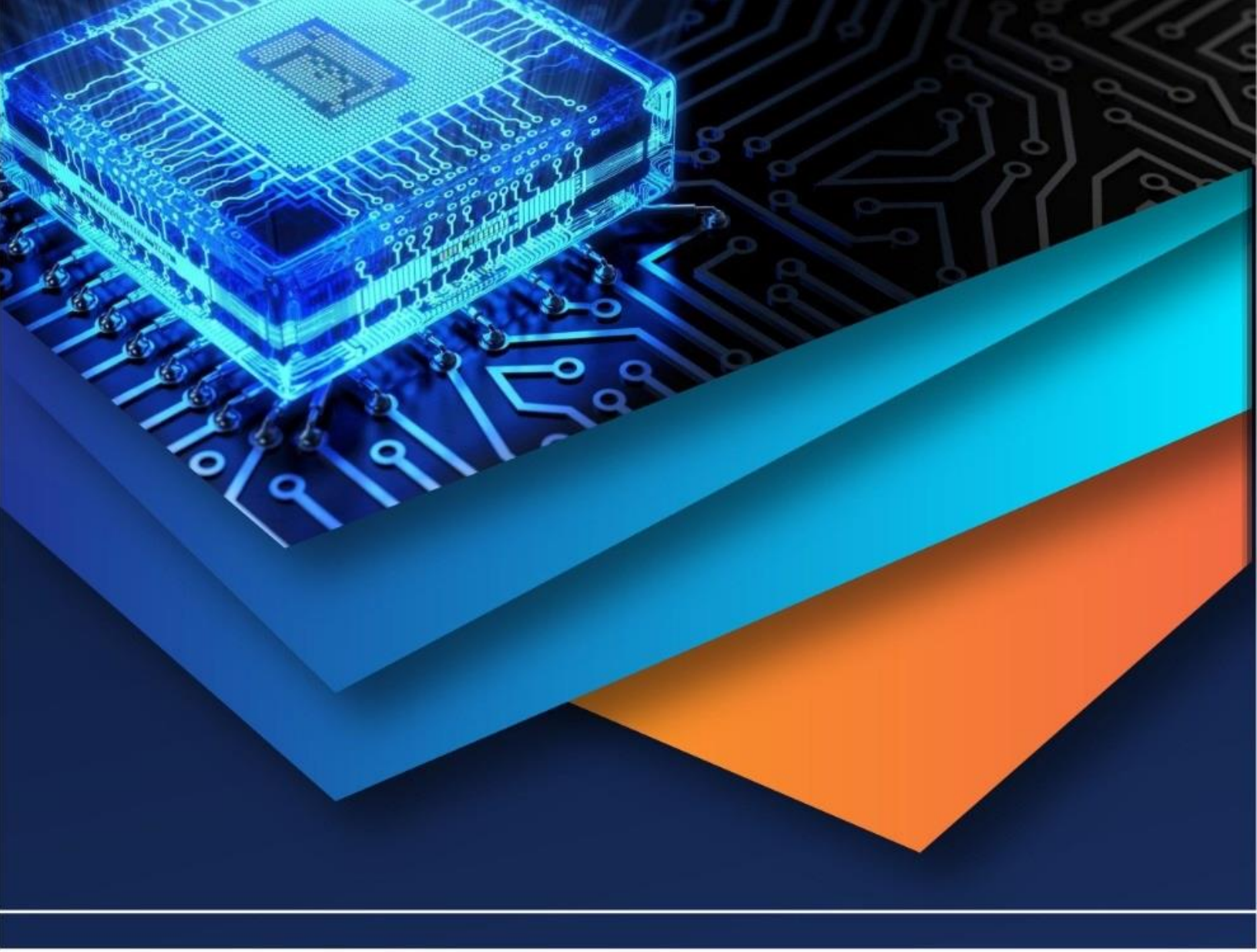

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