



Cash Sanitization Machine

TDMD Dahanayaka, AR Lokuge, LBD Chinthka and IU Atthanayake

*Department of Mechanical Engineering, The Open University of Sri Lanka
Nawala, Sri Lanka, +94
tharudahanayaka@gmail.com*

ABSTRACT

COVID-19 pandemic has been rapidly disseminating across the world. It quickly spreads between people, mainly when an infected person is in close contact with another person. When an infected people cough, sneeze, speak, sing or breathe heavily this virus can spread from an infected person's mouth or nose in small liquid particles. World health organisation has issued health guidelines to stay safe against this virus such as Maintain physical distancing of at least 1m, or wear a mask when physical distance cannot be maintained, perform frequent hand hygiene with alcohol-based hand sanitizer or soap and water. According to them the methods to prevent the touching of a contaminated surfaces plays a vital part in this situation. In day to day life routines there are some situations such surface contact becomes unavoidable. One of the major situations among them is money Transactions. It was revealed that corona virus can stay on cardboards and paper surfaces for 24 hours and up to 72 hours on shiny surfaces such as coins [1]. Therefore, worldwide recommendation is to use e-transactions and use cards. The US Federal Reserve ('The Fed') has been quarantining dollars repatriated from Asia before recirculating them, as a precautionary measure against spreading the virus, according to a Reuters report [2]. In a developing country like Sri Lanka the use of e transactions for money matters and use of credit/debit cards are comparatively less. Specially when it comes rural areas, people use paper notes and coins for buying various goods and services. Therefore, there is a risk involve in spreading the corona virus through currency notes and coins. Therefore, disinfection of currency notes and coins is a current necessity. We propose a machine to disinfect currency notes and coins that can be used by every shop when doing money transactions. In this technique the machine is located in shops near the counter where customer insert the money to the machine and the money is taken by the cashier of the shop. The balance from the cashier is also through the disinfection machine. In this case the transmission of virus through currency is prevented.

Key words: Cash Sanitization Machine, COVID-19 pandemic

PROPOSED DESIGN

In the proposed design the main disinfection method is to expose the currency notes and coins to ultraviolet light of wavelengths of 265nm - 285nm. It was revealed that the Corona virus gets killed if it exposed to the selected type of ultraviolet light [3]. In the proposed machine there are two different compartments are designed for disinfecting the notes and coins separately. The compartment for coin disinfection has been proposed to design such a way that the coins can be inserted to the disinfection area under the effect of gravity, where the coin inserting area will be made slanted, so that coins will slide along the surface. Then the coins will remain expose to the UV light for 3-4 minutes and will be dispensed using Arduino controlled door. The notes can be inserted to the compartment where the notes get exposed to ultraviolet light, by a roller actuated by a DC Motor. A schematic diagram of a proposed machine is shown in figure 1 and figure 2 from two different angles of view.

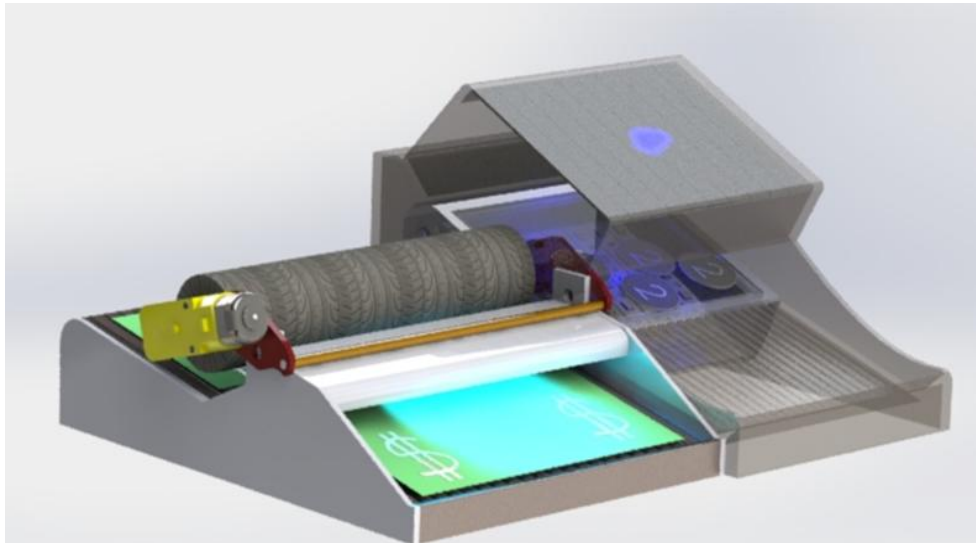


Fig. 1 Schematic diagram of the proposed disinfection machine

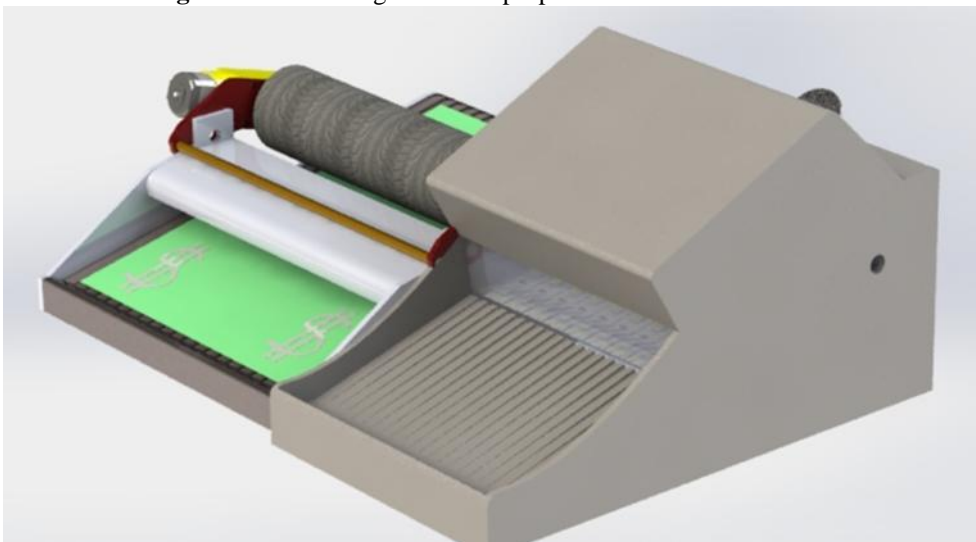


Fig. 2 Schematic diagram of the proposed disinfection machine looking from a different angle

REFERENCES

- [1]. Van Doremalen, Neeltje., Bushmaker, Trenton., Morris, Dylan H., Holbrook, Myndi G., Gamble, Amandine., Williamson, Brandi N., Tamin, Azaibi., Harcourt, Jennifer L., Thornburg, Natalie J., Gerber, Susan I., Lloyd-Smith, James O., de Wit, Emmie., Munster, Vincent J. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1 , *New England Journal of Medicine*, 2020, 10.
- [2]. <https://www.reuters.com/article/us-health-coronavirus-fed-dollars/fed-quarantines-us-dollars-repatriated-from-asia-on-coronavirus-caution-idUSKBN20T1YTJ>
- [3]. Duan SM, Zhao XS, Wen RF, Huang JJ, Pi GH, Zhang SX, Han J, Bi SL, Ruan L, Dong XP. Stability of SARS Coronavirus in Human Specimens and Environment and its Sensitivity to Heating and Environment and UV Irradiation. *Biomed Environmental Science*, 2003, 6,246-255.