

Review Article

Modern Technology Microphone Face Mask

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How to cite this article:

Singh G. Modern Technology Microphone Face Mask. *J Adv Res Inform Technol, Syst Mgmt* 2023; 7(2): 29-32.

Date of Submission: 2023-10-16

Date of Acceptance: 2023-11-23

A B S T R A C T

We have come across so many diseases from our early age. During every such occurrence, mankind fought for their survival using various developments to handle, resist and overcome the spread of disease. In this current situation the world is suffering from COVID-19. One of the major pre-cautions to stop spreading the SARS COV-2 is to wear a mask that plays a major role to stop spreading virus from one person to another person. Currently we have many types of masks in use such as surgical mask, cloth mask, N95 respirator mask etc. An elaborate literature review of all the masks is given. The proposed method is to introduce a new microphone face mask which can be used in operation theatre, educational purpose and in important bases. The face mask contains an air filter which has an elegant feature and it has no contact with the face area. It has a transparent adjustable face shield that covers the face along with the microphone.

Keywords: COVID-19, Face Mask, Adjustable Face Shield, Air Filter, Microphone

Introduction

In this pandemic period total world is suffering from shortage of the productive equipment's. Modern technology microphone face mask helps to overcome the problem such as causing Irritation and sweating due to contact with nose and mouth. The main feature in this mask has a major advantage it holds with a microphone that helps in medical profession, educational profession and bases of speaking needs. In recent years while wearing normal mask the speaker has to take off his mask when he holds the mike, but our design provides a mask it holds the microphone, so that the speaker will be in his comfort zone. The virus is mostly spread to the people through the droplets from the infected person, so we used Adjustable Face shield in this MTMFM (Modern technology microphone face mask).

These face shield serves as a primary productive for the COVID-19 warriors, as it provides end to end protection. In this equipment there is also a five-layer air filter face mask. The five-layer air filter face mask starts from non-woven polypropylene layer, activated carbon layer, Electrostatic filter layer, Melt blown filter, and ends with Skin friendly fabric layer.⁵

Literature Survey

Recently COVID-19 threatens people life all over the world. Like this so many diseases were found before which we came across by fighting with them. The first step to destroy is to prevent, so first we have to prevent the spreading of micro-organisms that causes diseases and infections. Face masks played a major role in coming across many diseases like flu, influenza epidemic, SARS and plague epidemic

as it stops the spreading of micro-organisms that causes diseases.⁶ Nasal cavity and mouth cavity are the two main areas through which the micro-organisms can get into our body which causes diseases. By wearing mask we can overcome this. In this current pandemic of COVID-19 face mask plays a vital role in stop spreading the virus which causes the disease. In six(6th) century BC, some pictures of human being were wearing cloth above their mouth on the doors of Persian tombs.¹ In China, Yuan Dynasty (1279-1368), a category of scarf woven added with the silk and gold threads was be of the opinion that to be the similar to the today's face mask. In the 16th Century, a Beak Mask was invited by the French doctor Charles de Lorme. This is still widely used in fire escaped guides today. In 19th century, the outline of the face cover mask gets hold of a massive step forward. In 1827, a technical method called "Brownian motion" which used to protect the reaction of masks on dust. on 1848, the protective face cover mask for miners which was a milestone in the olden days mask. In 1861, modern mask was discovered for the presence of bacteria in air by French Biologist, Louis Pasteur. He created a six layer of mask. (1644-1911) years Between, Chinese medicinal scientist Wu Liande come up with a mask made of two layers of gauze in response to a plague in Northeast China. In pandemic of SARS virus in 2003, the mask types such as N95 and KN90, which can able to filter out the fine particular matter.

Surgical Mask: It is a disposable mask where it is used by health professionals during healthcare procedures to protect them from the bacteria in liquid droplets from the patients. With admire to some virus like influenza they appear much effective as protective mask such as N95. It is also called as medicinal mask etc. latest surgical mask began to be used in 1960s.² Surgical masks are popularly worn in Asian countries like Japan and South Korea to decrease the spread of airborne viruses. In Japan it is common to see these face cover mask worn throughout the flu (influenza) season.



Figure 1. Surgical mask (P.C Google image)

N95 Mask: An N95 mask or N95 protective respirator is a particulate purify face piece respirator which filters minimum 95% of airborne mote. It is same like a mechanical purification protective respirator, which defense in opposite to particulates but not against gases or vapors. It needs a fine mesh of synthetic polymer fibers, especially a non-woven polypropylene fabric. It is fabricate by melt blowing which make the internal clean layer that purify hazardous particles. N95 face masks has many old predecessors. It was a one of the design for face cover cloth mask by Lien-the Wu, who was worked for the Chinese imperial court in the fall of 1910 during Manchurian plague impact. These were the first that secure use from bacteria in empirical evaluate, and inspired masks used during the period of flu infection pandemic in 1918. N95 Respirator was used in nuclear company industry and then in other branches of economy. in 1995 N95 respirator face masks became a medical standard subsequent to infection blocking automation designed by Professor Peter Tsai and patented. The drug resistant tuberculosis was controlled by antiviral technology which was invented first for control.



Figure 2. N95 Mask (P.C Google image)

Cloth Mask: This mask is made up of cotton textile, which is wear over the mouth and nose. They are inefficient than N95 protective masks, surgical face cover masks, or physical separate in secure the wearer against viruses. They are won't consider to be secure protective equipment by public health agencies. Prior to the corona virus pandemic, regular usable cloth face masks were predominantly used by medical field workers in developing countries and were specific prominent in Asia. Face cover Cloth masks variance with surgical masks and protective mask and such as N95 masks, which are developed on nonwoven fabric begin throughout a melt blowing procedure, and they are stability for their usefulness. Like surgical face protective masks, and dislike inhalator, face cover cloth masks do not predict a seal around the face. In 16th century, Leonardo da Vinci direct the useful of a wet woven face cover cloth to protect opposite harmful agents of chemical warfare. These were used in

some countries during the 2002-2004 SARS outbreaks and in West Africa countries during the Ebola epidemics in (2013-2016)



Figure 3. Cloth mask (P.C Google image)

System Design

Methodology: Our main goal is to provide a trouble-free microphone face mask. The project mainly focuses on comfort zone of speaker. The main aim is to give a well equitable uses friendly environmental face mask. This paper comes with a consistent solution for problem faced by using Adjustable face shield, microphone and air filter face mask. The Adjustable face shield will protect the external area, in which it will not allow the virus to enter the face. There is a possibility for virus to enter the face shield, to avoid this a five-layer air filter face mask is attached with the face shield and it will defend the virus entering into the nose and mouth. Both the combination of face shield and air filter face mask will give complete protection for the speaker.

Proposed system: The project mainly attention on secure for the speaker in the field like medical professionals, education professionals, and others important it bases. The role of our project is to stop spreading the virus from one person to another person. Issues tackle while wearing normal mask; it causes sweating, irritation and fogging up on the glasses while speaking or even just breathing. Due to these issues virus can attack the person in two ways, fist that the person touch glasses to wipe off the fog and it can involve touching the eyes, the second hazardous it can increase the eye sight issue if one use the foggy glass or choose to avoid wearing them. In this project, give the solution for above issue using Adjustable face shield and non-contact air filter face mask. The one of the application in modern technology microphone face mask is during the surgery in operation theater in hospital the chief surgeon may not be clearly audible to head nurse or physician

assistant due to the wearing normal mask. This project gives the above solution for above issue using microphone

Adjustable Face shield: Adjustable Face shield is one of the personal protection devices for blocking, defending the face area and connected mucous membranes starting with sprinkles and splatter of human body fluids.⁴ A adjustable face shield is a simple curved plastic panel attached to a head band that can be worn over the face and extended beyond the chin. The Thousands of probable users of adjustable face shield include medical providers, fire fighters, pre-hospital emergency medical contributor, health care works, veterinary care, laboratory workers and staff dealing with contaminated waste. Unlike masks that guard the nose and mouth, face shield may also help from defending the viruses through the eyes. It is a personal protective equipment that cover the entire face and protect from hazards like infectious material, chemical splashes in industry.⁷ "Face Shield" is used to protect a doctor and surgeons during a operation, when they exposed to infectious fluids or blood.

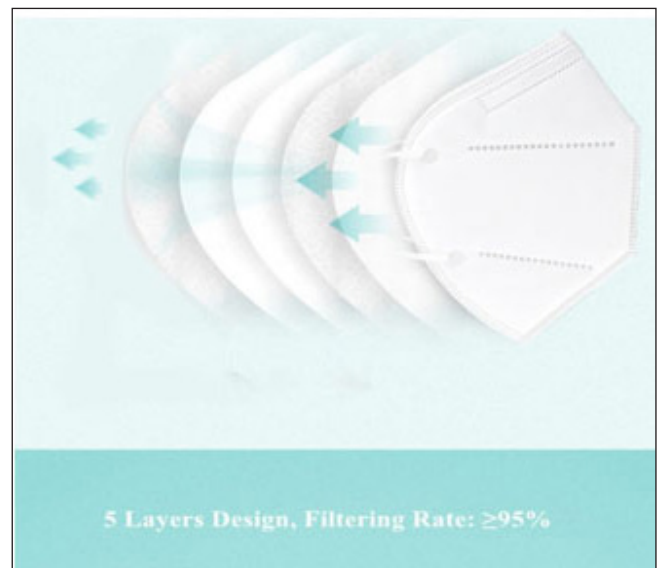


Figure 4. Adjustable Face shield (P.C Google image)

Microphone: Microphone is a gadget that transform sound into electrical signal. Microphones became a part of everyday life. They used in computers for recording voice, speech recognition and for non-acoustic purposes such as ultrasonic sensors. There are many different types of microphones depending upon the application. In this paper A Mini FM Transmitter Microphone is inbuilt along with the face mask. The size of the microphone is 2cm*1cm (L*W). This microphone receives FM signal ranges from 88-108 MHz, frequency can be adjusted by an adjustable capacitor and audible up to 100 meters as reference distance. The microphone works at 2V-9V DC Voltage and requires 9mA/3V current supply.

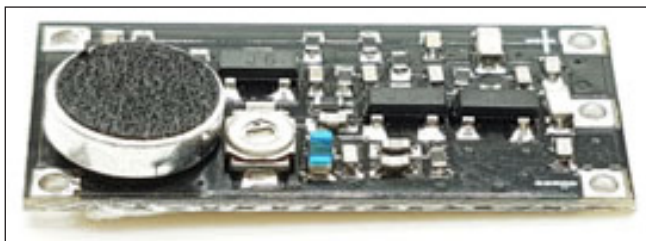


Figure 5. Mini FM transmitter Microphone
(P.C Google image)

5-Layer Air Filter: 5-layer air filter can reduce the risk from common air viruses such as Ebola virus, corona virus etc. the special role of 5-layer air filter is made up 5 layer they are start from non-woven polypropylene layer, activated carbon layer, Electrostatic filter layer, Melt blown filter, and ends with Skin friendly fabric layer. The Non-woven polypropylene layer provides specific function they are absorbency, fluid repellence, resilience, recline, softness, purify bacterial hurdle and infertility. It is a one of the Activated carbon layer is a carbonaceous, extremely porous adsorptive method that has a complex composition consist of carbon atom. The intrinsic pore matrix in the lattice arrangement of activated carbon which grant the remove of impurities from gas and fluid media throughout the system refer to as absorption. The Electrostatic filter layer plays Electrostatic attraction mechanism that employs electro charged polymer or resin fiber that attracts both small and large particles and trap them. The Melt blown filter has a good waterproofness and breathable due to its special structure. It has high filtration efficiency, integrates functions such as, bacterial isolation, heat isolation, poison filtration, non-toxicity and non-irritation. The Skin friendly fabric layer will effectively protect you or others, it needs to block the particles at much higher velocity. This five layer filter can be removed and reusable.

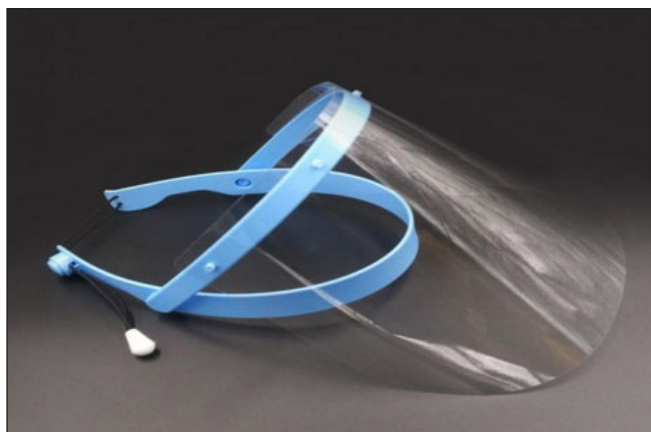


Figure 6. 5-Layer air filter (P.C Google image)

Conclusion

The prime objective of the project is to use microphone with mask. The overall implementation has low cost and can be easily configured. The five-layer air filter is attached with adjustable face shield, both are connected near together. So, the virus can not able to take part in the facial area. MTMFM (Modern technology microphone face mask) is a lightweight material allows to wear in any place, also allows to breath freely in any condition and in extra comfort zone. This paper describes about two primary areas, one is to stop spreading virus from one person to another and second for better contribution for the speaker in various field such as (medical profession, educational profession and speaking profession and bases for other needs). There are pair layer of barrier in which the person is completely free from virus by using modern technology microphone face mask with the help of adjustable face shield and 5-layer air filter. The microphone is adjustable at every circumstance. The design of the face mask ensures and effective feel from outer air. This model suggesting the efficient one among other.

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