TRANSPARENT and CUSTOMIZABLE FACE MASK

FIELD OF INVENTION

A medical grade face mask comprising a central transparent window that is customizable for improved visibility, use and wearing comfort.

The present invention relates to see-through medical grade face masks for healthcare professionals and service industries workers with built-in customizability on the transparent window for improved fit, comfort, and visibility, while providing certified level of protection against pathogenic contaminants (e.g., bacteria and viruses) and particulates.

BACKGROUND OF INVENTION

Face masks are universally used in the healthcare profession and elsewhere to reduce the risk of transferring infectious bacteria, virus and the like between the nose and mouth of individuals. The rapid increase of infectious diseases, particularly COVID-19, has made the use of personal protective equipment at healthcare facilities increasingly important. Elsewhere, universal masking requirements for community dwellers and personnel working in all industries have been mandated by many governments around the world to prevent the spread of COVID-19 and its variants. In some cases, the use of certified medical grade face masks was recommended over other non-certified face coverings for better protection, especially in areas hard-hit by the virus.

However, conventional certified medical grade masks made with opaque non-woven materials and others alike have resulted in unintended communication barriers between wearers, especially with communication vulnerable individuals (e.g., deaf, or hearing-impaired, speech-impaired, elderly, young children, cognitively impaired) and where there is significant background noise. Individuals who have either consciously or sub-consciously relied on lip or speech reading suddenly find themselves less able to perceive and understand the world around them like they used to. Many industries that traditionally depend heavily on the conduct of face-to-face verbal communication for the delivery of

services (e.g., restaurants, educational institutions, aviation, and healthcare industry) have resultantly been impacted the most.

Face masks having a transparent portion over the mouth area of the wearer, such as those described in U.S. Pat. No. 7,802,572 and D803,391S, promote better communication between the speech generator (i.e., wearer) and the speech recipients (e.g., patients). The use of redesigned face masks benefits patients by reducing anxiety, improve conveyance of empathy from the carers and improves care delivery, all while being protected from pathogenic contaminants (e.g., bacteria and viruses) and particulates.

Nonetheless, there exists a need for face masks that can (a) provide customizability for improved wearing comfort; (b) are low cost and not resource-intensive to manufacture to drive availability and use, (c) continue to provide an effective barrier to air-borne pathogens; and (d) provide improved communication between service providers and their clients through enhanced visibility of the lower face and mouth.

SUMMARY OF INVENTION

There are two materials in concern:

Non-woven and woven fabric typically made of polypropylene/ polystyrene/ polycarbonate/ polyethylene/ polyester/cotton and multi-layered.

Transparent window is typically made of a pliable, transparent plastic sheet material with pre-formed grooves (or folding lines) which extends from edge to edge.

Typically, there will be a sizable cut-out in the middle of the non-woven fabrics. The transparent window is installed to the outer air-permeable portion by sandwiching in between multi-layers of non-woven/woven fabric and secured around the frame of the transparent window to achieve a seal.

The wearer will first fold the transparent window along the pre-formed grooves (or folding lines) towards the inner side of the mask. The wearer then put on the mask with the transparent window aligned to the mouth. Further adjustments can be made to the clear window by folding or unfolding to achieve better comfort while wearing or speaking.

The embodiment may be disposed after usage of the suggested duration.

BRIEF DESCRIPTION OF INVENTION FIGURES

In order that the invention may be fully understood and readily put into practical effect there shall now be described by way of non-limitative example only exemplary embodiments of the present invention, the description being with reference to the accompanying illustrative drawings.

FIG. 1 is a front view of an exemplary embodiment of the pre-folded transparent face mask 10 with multi-layered fabric mask body 11, cut-out 12 hole for the transparent window, elastic ear loops or ties 13, nose band 14, transparent window 20, and preformed grooves 21 on transparent window 20.

FIG. 2 is a perspective view of an exemplary embodiment of the pre-folded transparent face mask 10 with transparent window 20, and preformed grooves 21 on transparent window 20.

FIG. 3 is a perspective view of the exemplary embodiment of the transparent face mask 10 shown over the face of a wearer. The transparent face mask 10 with transparent window 20, folded along the preformed groove 21, over the mouth of the wearer such that the mouth is visible.

FIG. 4 is the side view of the exemplary embodiment of the transparent face mask 10 in its folded state provides mouth clearance 22.

DETAILED DESCRIPTION

Exemplary embodiment of the transparent face mask 10 will be described below with reference to FIGS. 1 to 4. The same reference numerals are used throughout the figures for the same or similar parts.

The central region of the transparent face mask 10 has a transparent window 20 assembled, which give a clear aperture for the wearers to display their mouth when speaking to provide improved communication between service providers and their clients, at the same time provide an effective barrier against air/droplet-borne pathogens and contaminants.

In general, to provide a transparent window on a face mask as illustrated in FIGS 3, the transparent face mask 10 is made by first creating a cut-out 12 in the multi-layered fabric mask body 11 as shown in FIGS 1. The transparent window 20 is then placed between the cut-out 12 on the outer layer of the non-woven fabric. The inner layer or layers of the non-woven fabric is/are then placed to sandwich the transparent window 20 within the multi-layered fabric mask body 11. Adhesion processes bond all layers that made up the multi-layered fabric mask body 11 and the transparent window 20 together, securing the around the frame of the transparent window 20 to achieve a seal around the cut-out 12. Sealing the transparent window 20 with the multi-layered fabric mask body 11 protects the wearer from air/droplet-borne pathogens and contaminants. FIGS 2 shows the assembled pre-folded transparent face mask 10 with the elastic ear loops or ties 13 and nose band 14 as illustrated in FIGS 1.

To use the transparent mask 10, the wearer first folds the transparent window 20, along the preformed grooves 21, towards the surface where the face contacts or inwards. The transparent window 10 transforms from a flat (unfolded state) to a relatively curved surface (folded state) that creates a mouth

clearance 22 when the wearer puts on the transparent face mask 10 as shown in FIGS 4. While the folded transparent window 20 aligns with the mouth of the wearer as shown in FIGS 3, the folded transparent window 20 prevents or minimize the wearer's lips touching the transparent window. During speech generation, the lips and tongue generally move and protrude. The mouth clearance 22 provides additional space to accommodate for the lip and tongue movement, and minimizes potential discomfort, which can be resulted by having the lips to touch the transparent window 20 frequently during movement.

The preformed grooves 21 extends from edge to edge of the transparent window 20 and are not limited by the number, the distance between each grooves, the orientation, the depth and the width of the grooves. The preformed grooves 21 aids the wearer to create purposeful folds along them, and to create the mouth clearance 22. Not folding the transparent window 20 along the suggested preformed grooves 21 may result in the reduction of clarity of the transparent window 20. The folding angle can vary, giving the wearer flexibility to adjust the mouth clearance 22 to satisfy individual's comfort needs and facial dimensions. The angles of the folds can also be adjusted before and during wear of the transparent face mask 10.

The transparent window 20 can be made of a pliable plastic sheet material with fog-resistant properties and/or glare-reduction properties.

While the material of the transparent window can be treated to give additional properties such as anti-fogging, the preformed grooves 21 also helps to collect condensation when the wearer speaks or exhale through the mouth. Preformed grooves 21 can channels the accumulated water droplets and guide it in the direction of gravity or the presence of wicking material to keep the transparent window 20 clear for a longer period. As mentioned above, wicks or absorbent material can be assembled at the edge cut-out 12 to hold the wearer's generated moisture for increased comfort and to keep the transparent window 20 clear.

The transparent face mask 10 can have two elastic ear loops or ties 13, in FIGS 1 affixed to the outer portion at either side of the mask to allow conformity of the transparent face mask 10 to wear's face when worn.

The transparent face mask 10 can have adjustable nose band 14, in FIGS 1 affixed to the top middle portion of the mask. The nose band 14 bends and conforms the top edge of the mask to the shape of the wearer's nose.

The transparent face mask 10 can maintain an overall flat profile in its unfolded state, as shown in FIGS 2 with the central transparent portion installed to allow flat packaging.

In this embodiment, the transparent face mask 10 described herein meets the criteria for standard medical grade mask protection.

In other embodiments, the transparent window 20 described here in can be installed in other reusable fabric face mask, which may be suitable for adoption by the wider community, or for use in non-healthcare settings or environments with less stringent infection control requirements.

In other embodiments, the transparent face mask 10 described herein can be resized to fit non-adult wearer's face (e.g., children) and other personalized needs.

In yet other embodiments, one or more designs or illustrations may be placed on the multi-layered mask body 11 to further aid in interaction between the wearer and the subject. For example, familiar characters (e.g., cartoon characters) or images (or illustrations) of organizational logos, flowers, and the like, may be placed on the mask. The images may be on one or more portions of the mask, although they preferably do not entirely block the view of the wearer's mouth.

It is noted that the present invention is not limited to one kind of filtering media and may include the use of any suitable filtration media with low airflow resistance effective for chemical and particulate filtration, and the like.

CLAIMS

This invention claims that:

1. Transparent face mask 10 comprises of:

   i) a transparent window 20,

   ii) multi-layered fabric mask body 11,

   iii) cut-out 12 hole,

   iv) elastic ear loops or ties 13, and

   v) nose band 14.

2. Multi-layered fabric mask body 11 of claim 1, comprise of multi-layered non-woven/woven fabric made of polypropylene/ polystyrene/ polycarbonate/ polyethylene/ polyester/cotton or any other filtering media.

3. Multi-layered fabric mask body 11 of claim 2, is not exclusive to be made of a single material for all layers.

4. Transparent window 20 of claim 1, comprises of preformed grooves 21 which extends from edge to edge.

5. Transparent window 20 of claim 4, is made of, not exclusive to, pliable air impermeable plastic sheet, that is of acceptable clarity for the viewing of the wearer’s mouth when worn.

6. Transparent window 20 of claim 4, may be made of materials with or without added treatment for, not limited to anti-glare, anti-fogging, anti-bacterial and magnification properties.

7. Preformed grooves 21 of claim 4, guides wearers of the transparent face mask 10 in folding the transparent window 20 along the preformed grooves 21 to create and/or to adjust the mouth clearance 22.

8. Transparent face mask 10 comprising of:

   i) a transparent window 20 located at the central portion with pre-formed grooves 21 that can be used by wearer to adjust fit over the wearer's mouth,

   ii) that provide additional channels to direct accumulated water vapor droplets from a wearer's breath towards the direction of gravity,

iii) the ornamental design for a medical grade face mask, as shown and described.

9. The transparent face mask 10 of claim 1, wherein the central portion of the mask is adapted to be positioned over the mouth of the wearer.
10. Wearer first folds the transparent window 20 inwards (i.e., towards the wearer's face) along the preformed grooves 21 to create the mouth clearance 22.
11. Following from claim 10, the wearer puts on the transparent face mask 10 by looping the elastic ear loops or ties 13 over the wearer's ears.
12. Following from claim 11, the wearer bends the nose band 14 to conform to the shape of the wear's nose bridge to ensure a better seal.
13. Following from claim 12, the wearer pulls the bottom edge of the transparent face mask 10 below the wear's chin.
14. Following from claim 13, the wearer aligns the folded transparent window 20 in front of the wear's mouth, as shown in FIGS 3 and FIGS 4.
15. Following from claim 10, the folded transparent window 20 provides a mouth clearance 22 which reduces the tendency of the wearer's lips touching the transparent window 20 during wear and when performing mouth movements (e.g., speaking).
16. Following from claim 10, the folding angle(s) along preformed grooves 21 is/are adjustable, which imparts a flexibility of the mouth clearance 22 to vary the size.
17. Following from claim 16, the flexibility of the folded transparent window 20 can function to improve wearing comfort over the wearer's mouth. Such needs are likely to differ from person to person due to varying facial dimensions and characteristics.
18. Following from claim 16, the flexibility of the folded transparent window 20 allows wearer to adjust the mouth clearance 22 before and/or during wearing of the transparent face mask 10.
19. Following from claim 7, preformed grooves 21 can function to channel accumulated water droplets form the wearer's breath and guide it in the direction of gravity or
20. Following from claim 7, the presence of wicking material that absorbs moisture generated by the wearer's breath or during speaking to keep the transparent window 20 clear.

21. Transparent face mask 10 components are assembled by first positioning the transparent window over at the cut-out 12 hole of the multi-layered fabric mask body 11.
22. Following claim 21, the components are then assembled using adhesion processes which bonds all layers and components together.
23. The transparent window 20 is sandwiched between the layers of multi-layered fabric mask body 11 and sealed around the cut-out 12 hole to improve wearer's protection against air/droplet-borne pathogenic and particulate contaminants.
24. This invention is designed to be single use over a period of time or discard when it is soiled or wet.
25. Transparent face mask 10 is not limited to dimensional constraints and can vary in size to be use on wearers across locations, demographics, and age groups.
26. One or more designs or illustrations may be placed on the multi-layered mask body 11 to further aid in interaction between the wearer and the subject.