

FACE MASK SEALING DEVICE

FIELD

[0001] The present invention generally relates to face masks used in medical and other applications, and in particular to a face mask sealing device for such masks. While the present invention will be described in relation to surgical face masks, it is to be appreciated that the present invention is not limited to use on such masks, and could also be used on other types of face masks.

BACKGROUND

[0002] The following discussion of the background to the invention is intended to facilitate an understanding of the present invention only. It should be appreciated that the discussion is not an acknowledgement or admission that any of the material referred to was published, known or part of the common general knowledge of the person skilled in the art in any jurisdiction as at the priority date of the invention.

[0003] Surgical face masks are widely used by medical staff in hospitals and medical centres. Such masks can also be by members of the public to prevent the spread of viral diseases in the community. These types of face masks have been widely worn by the community, for example during the COVID-19 pandemic. Surgical face masks are typically formed using a rectangular shaped pleated sheet of filtering material forming the main portion of the face mask which is worn over the nose and mouth of the wearer. Elastic bands extend as ear loops from opposing ends of the main portion of the face mask. Each band can be respectively stretched over each ear of the wearer to retain the face mask in place. A strip of bendable material can also be embedded along an upper edge of the main portion, and this band can be shaped to conform with the shape of the nose of the wearer to thereby improve the sealing of the mask in that area.

[0004] Conventional surgical face masks do however have several disadvantages. Firstly, while the face mask does cover the nose and mouth of the wearer, there can be a gap left between the face mask and the cheeks of the wearer when worn. This means that the face mask does not provide adequate sealing on

either side of the face mask when worn. This poorly sealed area of the face mask can also allow airborne matter including particulate matter and viruses a means to bypass the protection that should otherwise be provided by the face mask. Furthermore, airborne virus can escape from the side of the mask when the wearer has been infected by that virus and is wearing the mask to limit the infection of others.

[0005] Another disadvantage is that the face mask is pulled closely over the nose and mouth of the wearer when worn. This can restrict movement of the mouth and lips, and therefore the breathing of the wearer as well as making the face mask uncomfortable to wear, for example when the wearer is exerting themselves and breathing heavily.

[0006] An object of the invention is to ameliorate one or more of the above-mentioned difficulties.

SUMMARY

[0007] According to one aspect of the present disclosure, there is provided a face mask sealing device for a face mask having a main filter portion and ear loops respectively extending from opposing sides of the face mask, each said ear loop being made from an elastic band, the face mask sealing device comprising a generally planar main body, a first section of the main body having at least one pair of slots extending substantially across the first section from an outer periphery of the first section and engageable with the elastic band, and a second section of the main body, wherein the first section is locatable over a side of the main filter portion of the face mask, and the second section is locatable against a face of a wearer of the face mask when in use.

[0008] In some embodiments, the or each pair of slots are positioned in a generally parallel adjacent relation relative to each other.

[0009] In some embodiments, a plurality of pairs of slots are provided on the first section, each pair of slots having a different spacing therebetween.

[0010] In some embodiments, the face mask sealing device further comprising at least one band clip extending generally laterally from the main body for engaging the

elastic band.

[0011] In some embodiments, the or each band clip is jaw shaped having an opening for receiving and retaining the elastic band therein.

[0012] In some embodiments, the or each band clip is located on the first section near the second section.

[0013] In some embodiments, a pair of the band clips are provided in a spaced apart relation on the main body adjacent an outer periphery of the main body.

[0014] In some embodiments, the first and second sections are joined by a stepped portion.

[0015] In some embodiments, the stepped portion is a sloped transition between the first and second sections.

[0016] In some embodiments, the stepped portion has a height generally corresponding to a thickness of the main portion of a face mask.

[0017] According to another aspect of the present disclosure, there is provided a method of improving the sealing of a face mask having a main filter portion and ear loops respectively extending from opposing sides of the face mask, each said ear loop being made from an elastic band, the method comprising fitting a face mask sealing device as claimed in any one of the preceding claims such that the elastic band is engaged with the slots, the first section is located over a side of the main filter portion of the face mask, and the second section is located over a face of a wearer of the face mask.

[0018] Other aspects and features will become apparent to those of ordinary skill in the art upon review of the following description of specific embodiments in conjunction with the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] In the figures, which illustrate, by way of example only, embodiments of the present disclosure,

[0020] Figure 1 shows a top isometric view of a first embodiment of a face mask sealing device according to the present disclosure;

[0021] Figure 2 shows a bottom isometric view of the face mask sealing device of Fig. 1;

[0022] Figure 3 shows an image of a person's head wearing a surgical face mask with the face mask sealing device of Figs. 1 and 2 fitted onto a side of the face mask; and

[0023] Figures 4 a to c shows top isometric views of other embodiments of the face mask sealing device according to the present disclosure.

DETAILED DESCRIPTION

[0024] Throughout this document, unless otherwise indicated to the contrary, the terms “comprising”, “consisting of”, “having” and the like, are to be construed as non-exhaustive, or in other words, as meaning “including, but not limited to”.

[0025] Furthermore, throughout the specification, unless the context requires otherwise, the word “include” or variations such as “includes” or “including” will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

[0026] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as is commonly understood by a skilled person to which the subject matter herein belongs.

[0027] Referring initially to Figs. 1 to 3, there is shown a first embodiment of a face mask sealing device 1 according to the present disclosure. The sealing device 1 can be used with a conventional surgical face mask 3 as shown in Fig. 3. As previously noted, such masks 3 have a generally rectangular main portion 5 formed from pleated filtering material 5. A band of elastic material 7 is respectively secured at or adjacent the upper and lower corners of one side 6 of the main portion 5 to form an ear loop. A similar elastic band 7 is provided on the other side of the main portion 5. The surgical face mask 3, when worn, is positioned over the nose and mouth of the wearer 2, with each of the elastic band 7 at each side of the mask 3 being looped

around an ear of the wearer 2. Each elastic band 7 has an upper band section 9 and lower band section 11, and the face mask sealing device 1 can be attached to the upper and lower band sections 9,11 at each side of the main portion 5 of the mask 3 as shown in Fig. 3, in a manner that will be subsequently described.

[0028] The face mask sealing device 1 has a generally planar main body 15 and is divided into two sections 17,19. The first section 17 of the main body 15 has band engagement means for engaging the upper and lower band sections 9,11. The second section 19 of the main body can rest against a face of the wearer 2 of the face mask 3 when the face mask sealing device is being used.

[0029] The band engagement means includes at least one pair of slots 21,23 extending from a periphery 20 of the first section 17 towards the middle of the main body 15, with each slot 21,23 extending in a generally parallel and adjacent relation relative to each other. In the embodiment shown in Figs. 1 to 3, a pair of outer slots 21 are provided together with a pair of inner slots 23 located between the outer slots 21. The spacing between the outer pair of slots 21 is therefore greater than the spacing between the inner pair of slots 23.

[0030] The band engagement means further includes at least one band clip 25 located extending generally laterally from the middle of the main body 15. The embodiment shown in Figs. 1 to 3 show two such band clips 25 located in a spaced relation on the first section 17, and adjacent the outer periphery 20 of the main body 15. Each band clip 25 is in the form of a jaw having a throat opening 27 through which a band section 9,11 can be passed to engage and retain the band section 9,11 within the band clip 25.

[0031] The first section 17 is connected to the second section 19 via a stepped portion 27 which may be sloped to provide a smooth transition between the first and second sections 17,19. The 'height' of the stepped portion 27, being the gap between a plane containing the first section 17 and a plane containing the second section 19, can generally correspond to the average thickness of the main portion 5 of commercially available surgical face masks 3 upon which the face mask sealing device 1 can be used. Alternatively, different versions of the sealing device 1 having stepped portions 27 of different heights can be made to allow for use on face masks

of different thicknesses. The band clips 25 may be located on the first section 15 immediately adjacent the stepped portion 27, while the slots 21,23 can extend from the main body periphery 20 towards the stepped portion 27 stopping just before the position of the band clips 25.

[0032] The face mask sealing device 1 is used in pairs with one sealing device 1 secured to each side of the face mask 3. For each sealing device 1, the upper and lower band section 7,11 of the ear loop 7 is respectively passed through one pair of slots 21,23. The band sections 7,11 can either be passed through the outer or inner pair of slots 21, 23, with the inner slots 23 catering for people such as teenagers and children having a slim face. The band sections 7,11 can then be respectively engaged with a band clip 25 to thereby hold in place the sealing device 1 on the face mask 3. For smaller children, the band sections 7,11 can be placed in a crossed position over the first section 17 before being attached to the band clips 25. This significantly reduces the overall length of the ear loop helping to facilitate fitting of the mask on smaller faces. The first section 17 of the sealing device 1 rests against an outer surface of the mask, while the second section 19 rests against the face of the wearer when the face mask 3 is worn as shown in Fig. 3. As noted previously, the height of the stepped section 25 should ideally be similar to the thickness of the face mask main portion 5 to optimise the sealing effect of the sealing device 1 when used with that mask 3.

[0033] Passing the band sections 9,11 through the slots 21,23 acts to bring closer together the upper and lower corners on the side of the face mask 3 to which the sealing device 1 is being fitted thereby reducing the width of the main portion 5 at the side area 6 thereof. The pleated main portion 5 can then be spread out to form a three-dimensional cup shape while the now folded side areas 6 can be pressed flat against the underside of the first section 17. This has the effect of improving the seal of the face mask at either side thereof when worn. Furthermore, the face mask 3 is urged into a more three-dimensional shape, as shown in Fig. 3, which can improve the comfort level in wearing the mask as it can allow for substantially unrestricted mouth and lip movement of the wearer thereby making it easier for the wearer to breathe when wearing the face mask 3.

[0034] The embodiment of the face mask sealing device shown in Figs. 1 to 3 has a generally circular outer peripheral edge 20. However, the sealing device may also have other outer peripheral shaped edges. Figs. 4a to c show the alternative embodiments of the sealing device 1a,1b,1c. These embodiments share the same features as the embodiment shown in Figs. 1 to 3 but have a different outer peripheral edge. Fig. 4a shows a face mask sealing device 1a having a first section 17a with a generally triangular shaped peripheral edge 22a and a second section 19a having a generally semi-circular peripheral edge 24a. Fig. 4b shows a face mask sealing device 1b having a main body 15b with a generally triangular shaped peripheral edge 20b, while the face mask sealing device 1c shown in Fig. 4c has a main body 15c with a generally square shaped peripheral edge 20c. The peripheral shape of the face mask sealing device 1,1a,1b,1c may be selected based on the efficacy of the sealing device when used on particular face masks or may simply be selected based on aesthetic reasons or personal preference.

[0035] The face mask sealing device 1,1a,1b,1c may be reusable and may be also be made from a low-cost plastic material when sold to the public. However, such devices when used in medical facilities such as hospitals and clinics, may be disposable and may be made from a medical grade plastic material. The sealing devices 1,1a,1b,1c may also be made of slightly thinner plastic material as they will only be used one time prior to disposal. Also, the disposable face mask sealing devices 1,1a,1b,1c may only require one pair of slots 23 having a spacing suitable for adult use.

[0036] It should be appreciated by the person skilled in the art that the above invention is not limited to the embodiment described. It is appreciable that modifications and improvements may be made without departing from the scope of the present invention.

[0037] It should be further appreciated by the person skilled in the art that one or more of the above modifications or improvements, not being mutually exclusive, may be further combined to form yet further embodiments of the present invention.

CLAIMS

1. A face mask sealing device for a face mask having a main filter portion and ear loops respectively extending from opposing sides of the face mask, each said ear loop being made from an elastic band, the face mask sealing device comprising a generally planar main body, a first section of the main body having at least one pair of slots extending substantially across the first section from an outer periphery of the first section and engageable with the elastic band, and a second section of the main body, wherein the first section is locatable over a side of the main filter portion of the face mask, and the second section is locatable against a face of a wearer of the face mask when in use.
2. A face mask sealing device according to claim 1, wherein the or each pair of slots are positioned in a generally parallel adjacent relation relative to each other.
3. A face mask sealing device according to claim 1 or 2, wherein a plurality of pairs of slots are provided on the first section, each pair of slots having a different spacing therebetween.
4. A face mask sealing device according to any one of the preceding claims, further comprising at least one band clip extending generally laterally from the main body for engaging the elastic band.
5. A face mask sealing device according to claim 4, wherein the or each band clip is jaw shaped having an opening for receiving and retaining the elastic band therein.
6. A face mask sealing device according to claim 4 or 5, wherein the or each band clip is located on the first section near the second section.
7. A face mask sealing device according to any one of claims 4 to 6, wherein a pair of the band clips are provided in a spaced apart relation on the main body adjacent an outer periphery of the main body.
8. A face mask sealing device according to any one of the preceding claims,

wherein the first and second sections are joined by a stepped portion.

9. A face mask sealing device according to claim 8, wherein the stepped portion is a sloped transition between the first and second sections.
10. A face mask sealing device according to claim 9 or 10, wherein the stepped portion has a height generally corresponding to a thickness of the main portion of a face mask.
11. A method of improving the sealing of a face mask having a main filter portion and ear loops respectively extending from opposing sides of the face mask, each said ear loop being made from an elastic band, the method comprising fitting a face mask sealing device as claimed in any one of the preceding claims such that the elastic band is engaged with the slots, the first section is located over a side of the main filter portion of the face mask, and the second section is located over a face of a wearer of the face mask.