



US 20210392968A1

(19) **United States**

(12) **Patent Application Publication**
Fearing

(10) **Pub. No.: US 2021/0392968 A1**

(43) **Pub. Date: Dec. 23, 2021**

(54) **FACE MASK WITH ADHESIVE ELASTIC TAPE FASTEN**

(52) **U.S. Cl.**
CPC *A41D 13/1176* (2013.01); *A41D 13/1115* (2013.01)

(71) Applicant: **Stephen Gerard Fearing**, Calgary (CA)

(57) **ABSTRACT**

(72) Inventor: **Stephen Gerard Fearing**, Calgary (CA)

A face mask covering the face of a user has intended purpose of protecting the user's respiratory system. The face mask has ergonomic shaping for a comfortable fit and secure placement. The complete perimeter of the face mask has an adhesive elastic tape that is ergonomically shaped to hold properties and conform to the facial structure of the user. Removal tabs are connected to points of the elastic tape opposing the face mask contact side. The adhesive elastic tape is bordering the face mask on the area of the face mask, where there is contact to the user's facial skin. The shaping of the adhesive elastic tape conforms with the face mask's configuration, providing sufficient material overlap for bonding. Furthermore, the shape of the adhesive elastic tape has a thickness to maintain a tight grip and secure placement on the user's face with ergonomic fit attributes of facial structure.

(21) Appl. No.: **17/352,241**

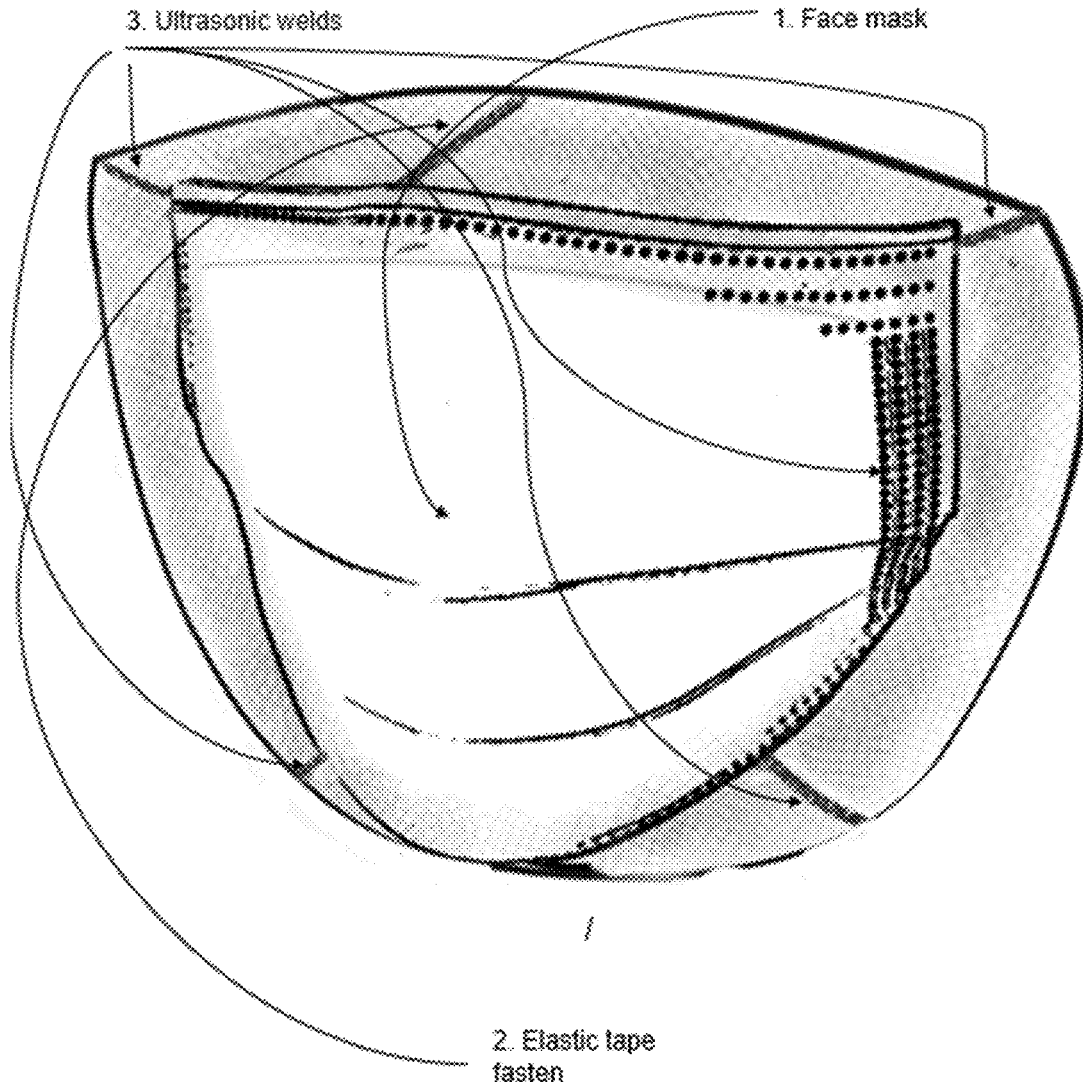
(22) Filed: **Jun. 18, 2021**

Related U.S. Application Data

(60) Provisional application No. 63/041,838, filed on Jun. 20, 2020.

Publication Classification

(51) **Int. Cl.**
A41D 13/11 (2006.01)



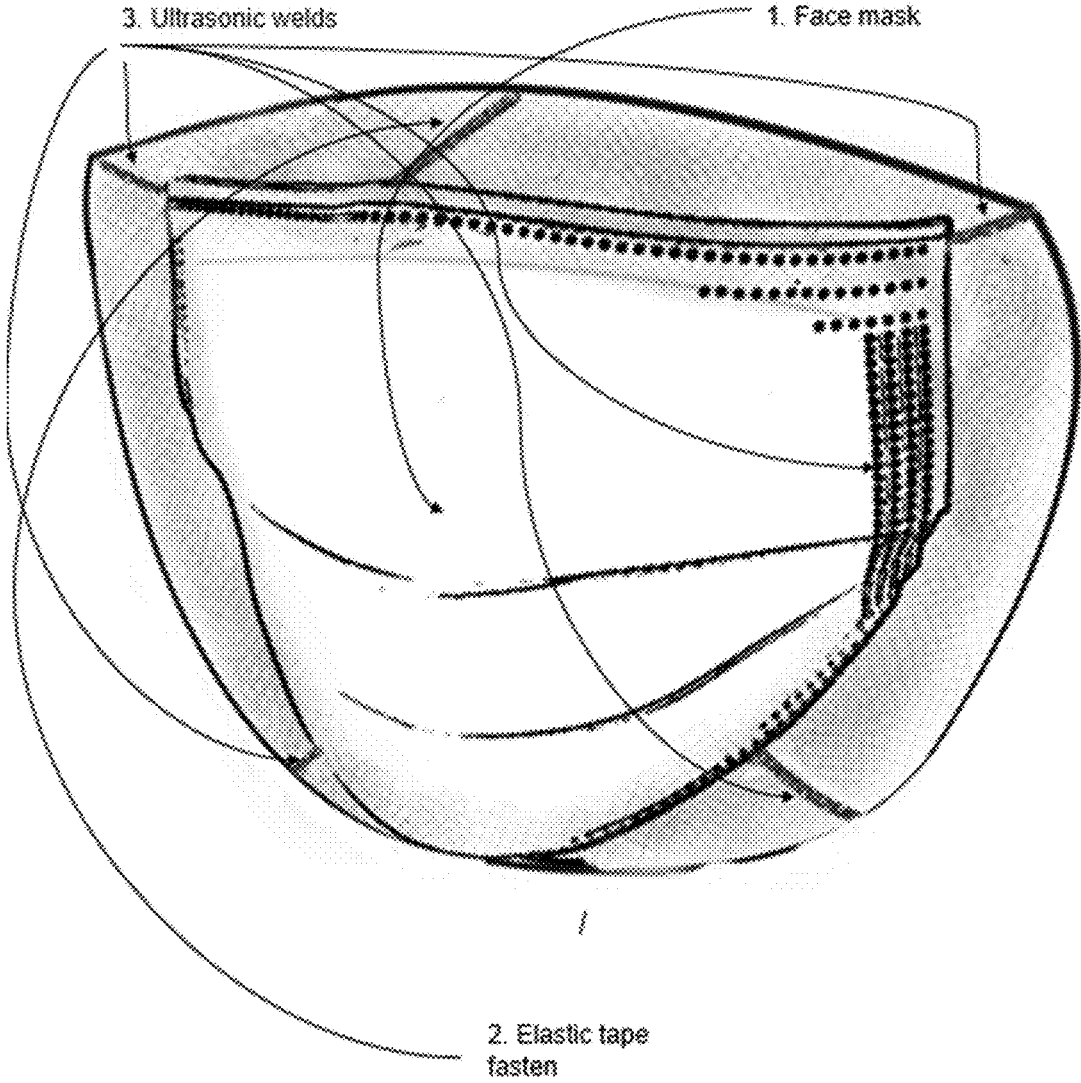


FIG. #1

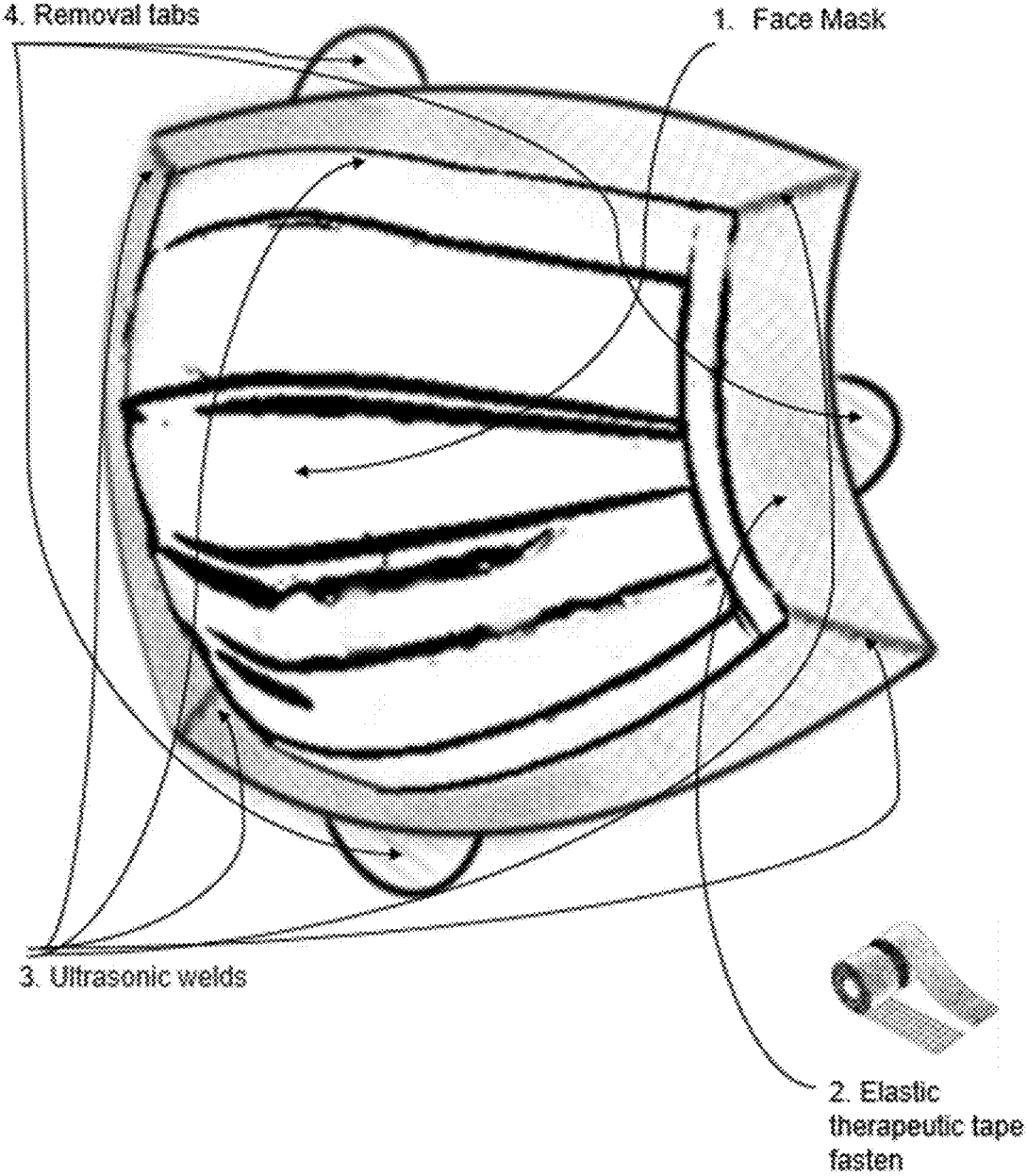


FIG. #2

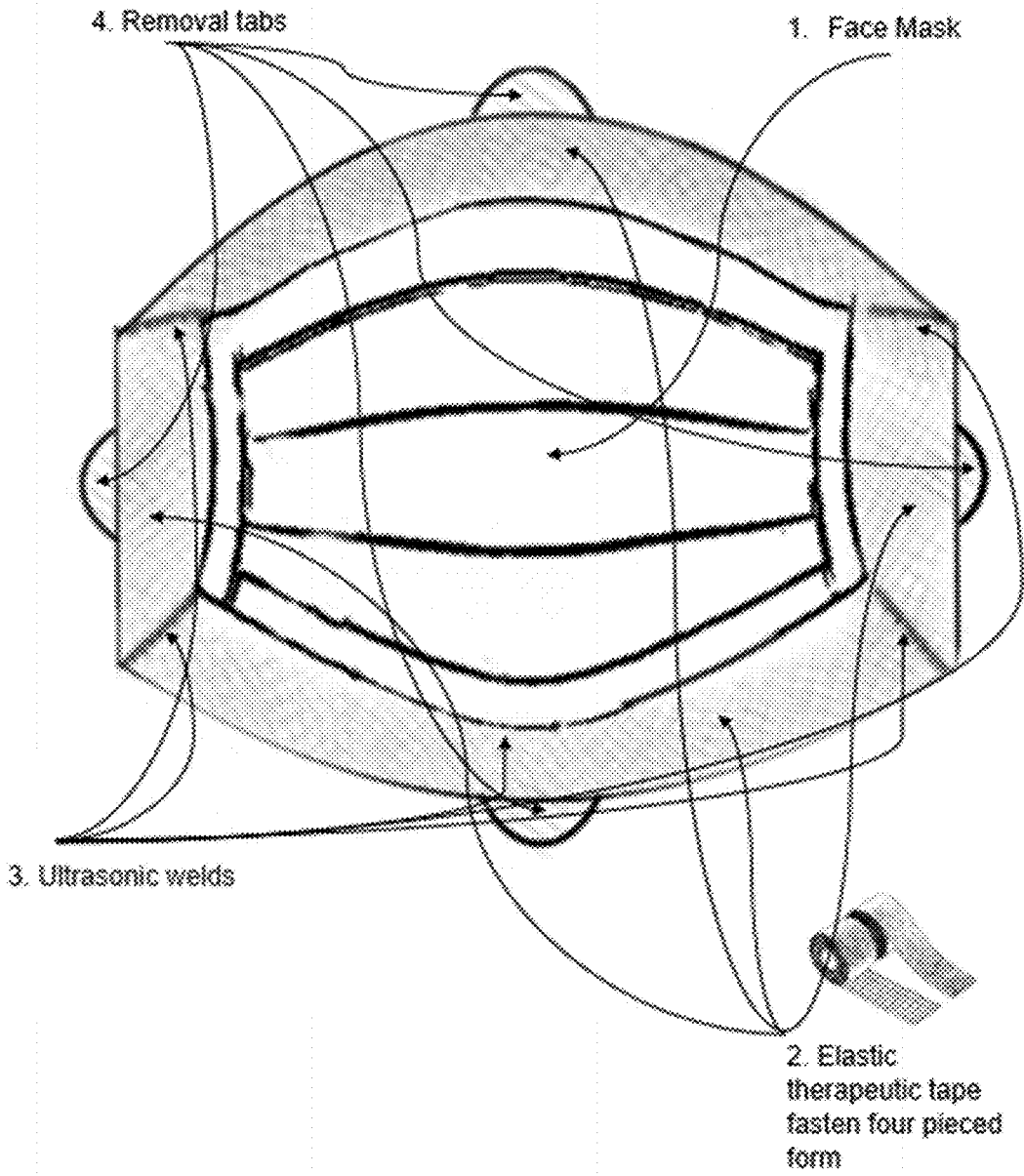


FIG #3

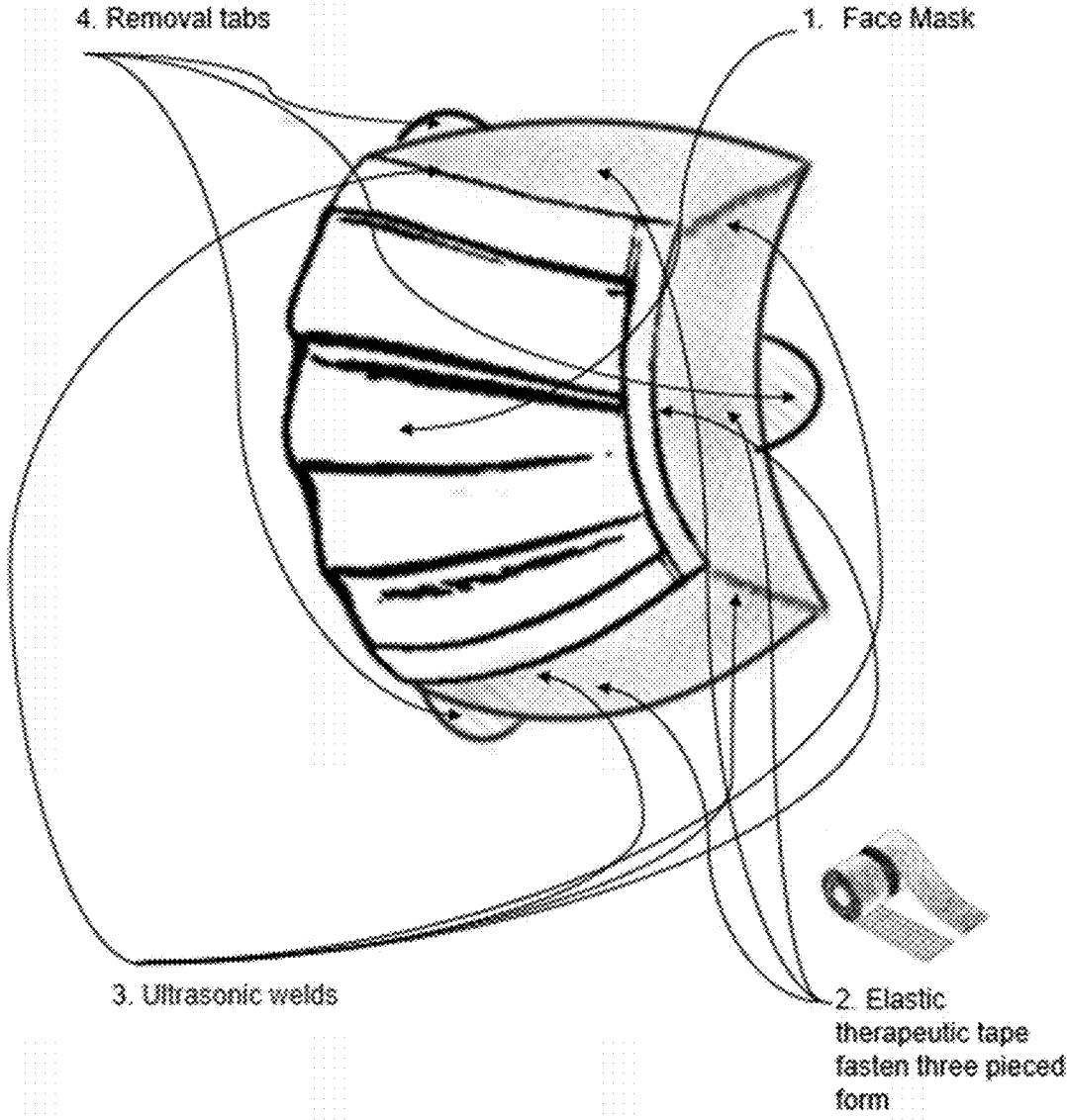


FIG #4

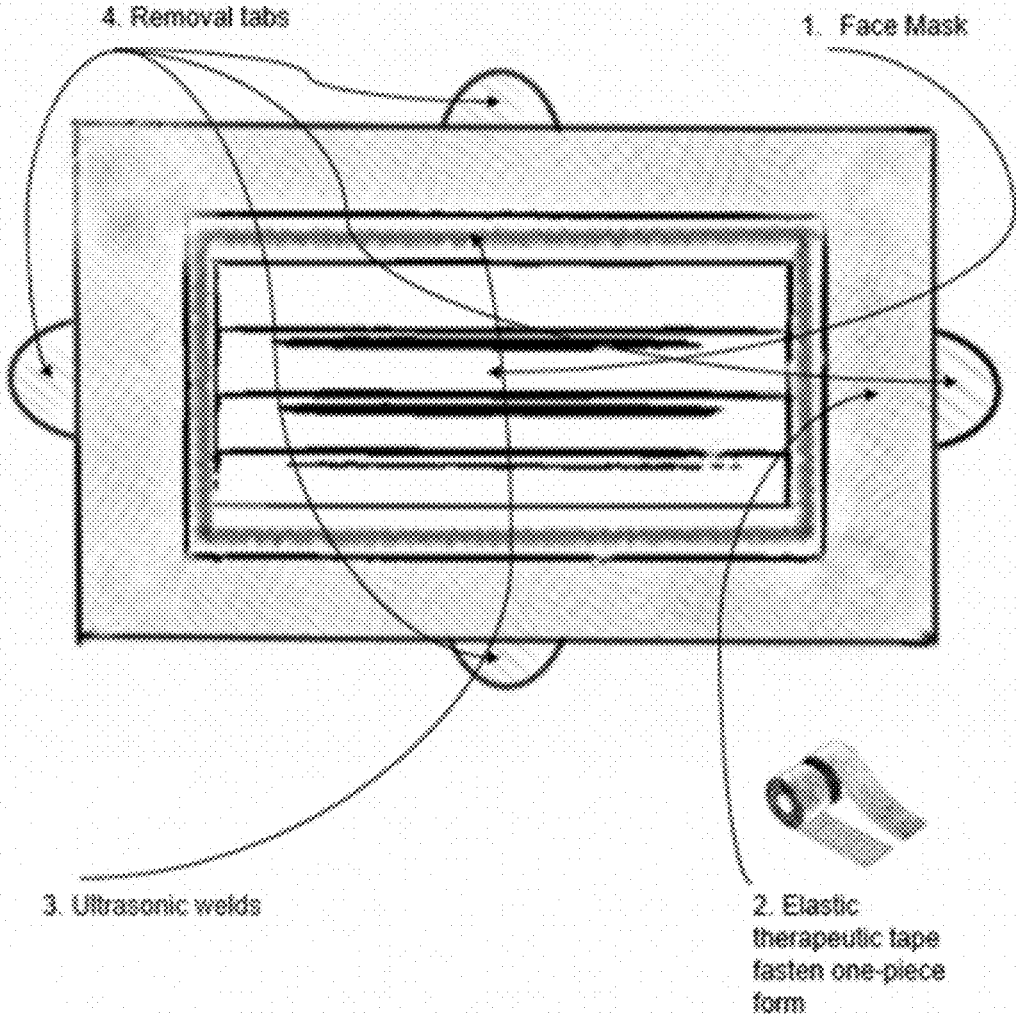


FIG. #5

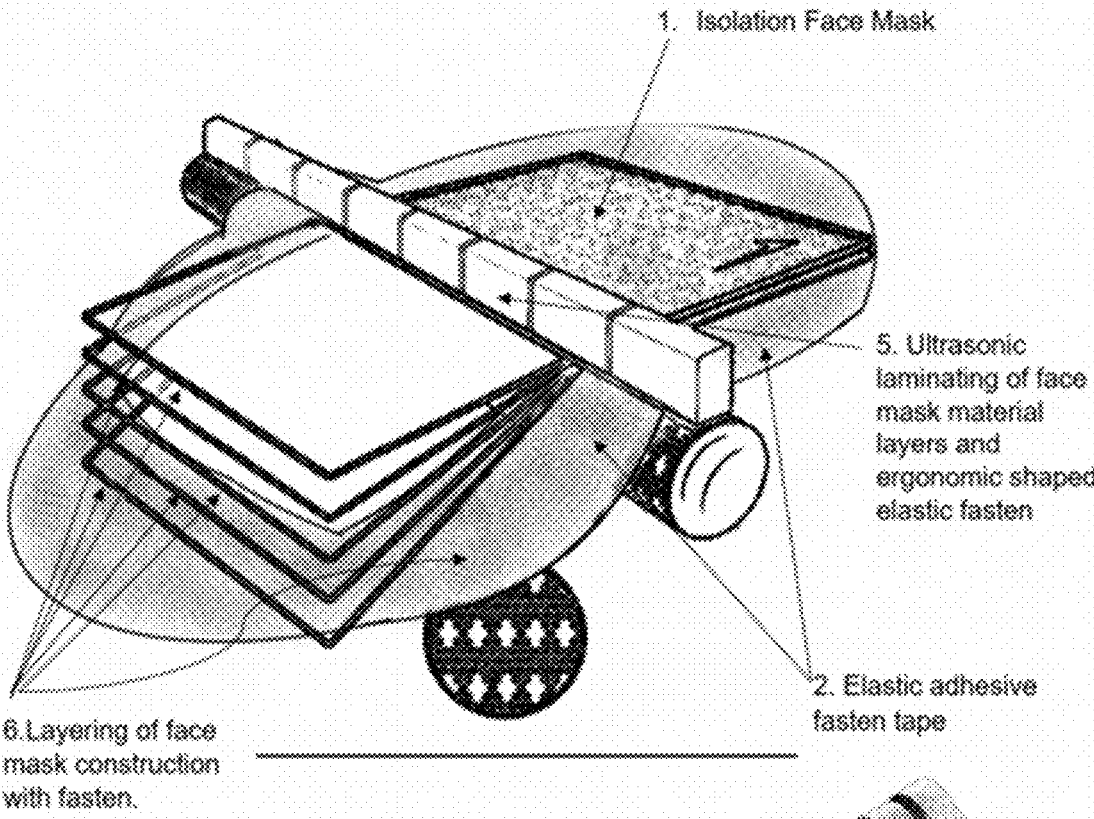


FIG. #6

FACE MASK WITH ADHESIVE ELASTIC TAPE FASTEN

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of priority of U.S. Provisional Application No. 63/041,838 filed Jun. 20, 2020, which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

(1) Field of the Invention

[0002] The invention pertains generally to face masks. More specifically, the invention pertains to face masks with adhesive elastic tape fastener and methods associated therewith.

(2) Description of the Related Art

[0003] Currently, there are a few solutions for the secure fixation of facemasks. Some of these solutions attempt to place and maintain the face mask's correct position and contact fit on the user's face. Still, these solutions fail to meet the needs of the industry because they leave gaps and seepage exposure between the contact between the user and the face mask, leaving a poor protection efficiency. Other solutions attempt to use ridged bendable materials integrated inside the face mask to shape with the nose area of the user. The human face presents a challenge for forming a seal between a face mask and the user's face. The human face is deeply contoured; moreover, the size and proportion of these contours vary widely between human faces.

[0004] Other solution attempts have been made to seal the perimeter of face masks better. For example, U.S. Pat. No. 4,319,567 describes a thicker perimeter in the nasal bridge and lateral cheek areas, and U.S. Pat. No. 4,807,619 describes multiple layers of fibrous filter material allowing for greater facial conformity. Typically, face masks include a plastically deformable strip of metal or other material, to allow the user to customize the shape of the portion of the periphery of the mask that extends across the bridge of the nose. After loosely fitting the mask over the face, a user can plastically deform this member to help the mask maintain a close fit across the bridge of the nose. Still, these solutions are similarly unable to meet the needs of the industry because they leave exposure at other points of contact around the face mask and the user's face. Other solutions attempt to use fitting standards of the qualitative fit test or donning of face masks and respirators to fit the user.

[0005] Still, these solutions require a trained person(s) for testing and measuring equipment to ensure the respirator's or mask's fit accuracy. Still, other solutions seek to hold the face mask attached to users with fixations to the user's head. Still, these solutions also fail to meet industry needs because there needs to be an accurate seal of fit that will allow the face mask to withstand displacement from external forces, movements of the user, various weather conditions, and also be uninhibited by other equipment resistance or headgear that periodically is simultaneously being worn by the user.

BRIEF SUMMARY OF THE INVENTION

[0006] It is desirable to have a device that provides a consistent and secure ergonomic fitted face mask fastened against a user's face, which increases the protection effi-

ciency for the intended purpose of the mask. Furthermore, it would also be desirable to have a device that is accurately and precisely fitted to the user's facial area comfortably. Still, further, it would be beneficial to have a device that can eliminate contact with the ears and back of the head that can be displaced by external forces and headgear. Some embodiments of devices and associated methods disclosed herein advantageously fill these need and address the deficiencies as mentioned above by providing a secure fixation of the face mask to the face eliminating gaps or seepage.

[0007] Disclosed according to exemplary embodiments are devices and methods associated therewith. With respect to the device, in some embodiments it is a face mask with elastic adhesive tape that is ultrasonically welded and laminated together. It provides securement and fastens the face mask by directly adhering to the user's skin. This fitting increase protection efficiency with a conforming ergonomic shaped contact point between the user and the mask. Core components of the device in some embodiments include the face mask, securing adhesive elastic tape, which, generally speaking, are configured as follows: The mask is bonded together with the adhesive elastic tape using ultrasonic welding and laminating. Concerning the device, it should be further noted that the secure fitting and conforming nature of the elastic tape will create a gapless connection between the mask and the user's face. With respect to the associated method, to carry out the process the following core steps are followed in some embodiments: alignment of the marker to the bridge of the nose (Nasal Bridge) with removal of the tape backing from the nose to one side of the cheekbone (malar bone) area stretching and pressing firmly down on the elastic tape creating a bond, then repeated on the opposite side of the face stretching the tape enough to make a fit and connection to the skin, third is the removal of tape backing on the bottom area of the mask and firmly pulling downwards towards the chin (Mental Protuberance) and jaw (Mandible) area of the face. Ultimately, after these steps, the user will have a conformed and tight fit of the face mask directly onto the skin of their facial area.

[0008] Disclosed according to an exemplary embodiment is a Face mask with adhesive elastic tape fasten, which is made up of the following components (1) face mask that covers the nasal and oral cavities of the user (2) adhesive elastic tape that is integrated with the face mask layers during construction (e.g., overlays the outside borders of the backside of the face mask) (3) ultrasonically welded and laminated perimeter of face mask layers and the adhesive elastic tape integration to the face mask. These components provide the fastening of face mask by directly adhering to the user's skin as follows: Removal of adhesive backing in sequence anchoring marking points to the user's facial features. The adhesive elastic tape is stretched and pressed on to the skin surface, sealing the face mask's complete circumference with the user's face. An advantage of this embodiment is providing a consistent and secure ergonomic connection of the face mask to the user's face increasing protection efficiency with a conforming contact point between the face mask perimeter and facial nasal and oral cavity area of the user.

[0009] The device in some embodiments may also have one or more of the following but is not limited to: (1) including face masks constructed to protect the respiratory system from unwanted aerosols from being inhaled or excreted by the user or protection of inhalation of pollutants,

dust, pollens, hazardous materials, gases, odors, surgical masks, procedure masks, medical masks, isolation masks, laser masks, fluid-resistant masks, surgical N-grade masks; (2) respirators, air-purifying respirators, filtering face-piece respirators, air-supplied respirators, N95 respirators, N95 surgical respirators, P-grade masks, particulate respirators, escape respirators, N95 N99 N100 grade masks, R95 R99 R100 grade masks, P95 P99 P100 grade masks, FFP1 FFP2 FFP3 grade masks, DS1 DS2 DS3 grade masks, KN standard graded masks, KF standard masks, YY standard masks, valves, non-valves; (3) the fasten of elastic adhesive tapes that can be pressed from one solid piece ultrasonically welded or laminated with the face mask layers during construction, two pieces of elastic tape ultrasonically welded and laminated with the shape face mask layers during construction, three pieces of elastic tape ultrasonically welded or laminated to shape face mask layers during construction, four pieces of elastic tape ultrasonically welded or laminated to shape face mask layers during construction; but not limited to materials, elastic therapeutic tapes, flexible securements, Silicone (or Silicon) Pressure sensitive application (PSA) adhesive, latex-free material with acrylic adhesive securements, kinesiology tape, K-tape, KT tape, Kinesio tape, any tape or securement with properties of stretchy, stretchable, springy, flexible, pliant, pliable, supple, yielding, rubbery, elasticized, plastic, recoiling, resilient, bouncy, adaptable, adjustable, compliant, accommodating, malleable, variable, fluid, versatile, conformable materials; (4) Removal tabs that can be added to the sides, top, bottom and other locations around the mask on the securement or tape material for easy, quick, and safe removal; (5) The securement or tape with indicator markers for purpose of alignment accuracy when the application of the device being fitted; (6) markers showing the sequence of tape removal and alignment points of the facial features to create consistent accuracy in the fixation of the device; (7) different sizes and shapes of the face masks to conform to facial features; (8) different ergonomic shaping of securement elastic tapes; (9) different securement or tape dimensions to coordinate with the face mask weight, shape, and size to provide tight and secured fixation on the user's face; (10) re-utilizable securement or tape with multiple adhering qualities (11) UVC or Far-UVC pouch, storage, for the device; (12) device face mask, securement, or tapes using biodegradable materials; (13) device face mask, securement, or tapes using recyclable materials; (14) device face masks with securement or tape fixation with visor; (15) fitting in the device for consuming liquids from containers; (16) fittings in the device for flexible polymer tubing; (17) fittings in the device for ventilator; (18) fittings in the device for anesthesiology; (19) fittings in the device for nutriment; (20) fittings in device for medications; (21) fittings in device for oxygen intake; (22) fittings in device for vapors.

[0010] Similarly, an associated method according to some embodiments may also include one or more of the following steps: alignment of the marker to the bridge of the nose (Nasal Bridge) with the removal of the tape backing from the nose simultaneously to both sides of the cheekbone (malar bone) area stretching and simultaneously pressing firmly down on the adhesive elastic tape creating a bond of tape and skin. Secondly is the removal of tape backing on the bottom area of the mask and firmly pulling downwards towards the

chin (Mental Protuberance) and jaw (Mandible) area of the face, creating a face mask's complete circumference contact of face mask to the skin.

[0011] Some embodiments of the device are unique when compared with other known devices and solutions because it provides: (1) a secure and tight contact of the face mask to the user's facial features improving the function of the facemask's protection efficiency; (2) pliable elastic and adjustable adhesive elastic tapes to conform into shape and possible facial features on the circumference of the face mask; (3) minimizes the dislodging and displacement of the face mask from external forces; and (4) can fasten to the user without interfering and causing friction with other headgear equipment simultaneously on the user's face or user's head. Similarly, the associated method is unique in that it: (1) has alignment markers; and (2) sequence for application creating a consistent tight-fitting of the face mask. Similarly, the disclosed method is unique when compared with other known processes and solutions in that it: (1) anchors the mask; (2) adjustable tension of elastic tape for comfort; and (3) sequencing for fit accuracy.

[0012] Certain embodiments of the disclosed device are unique in that the device is structurally different from other known devices or solutions. More specifically, the device is unique in some embodiments due to the presence of (1) a way to fasten the mask eliminating seepage or gaps at the contact points between the user's face and the mask; (2) ergonomic shaping of the adhesive elastic tape for an adjustable fitting; and (3) fasten of elastic tape which can stretch to adjust shaping of fit and comfort.

[0013] Furthermore, a process according to exemplary embodiments and associated with the device, as mentioned above, is likewise unique. More specifically, the disclosed process owes its uniqueness in some embodiments to the fact that it (1) has a secure fitting marker that increases the face mask protection efficiency. (2) A consistent form and correct location placement of the face mask; and (3) breathable adhesive elastic tape fasten that keeps the face mask from being displaced by external factors, such as headgear, helmets, weather condition, impact forces.

[0014] These and other advantages and embodiments of the present invention will no doubt become apparent to those of ordinary skill in the art after reading the following detailed description of preferred embodiments illustrated in the various figures and drawings. This disclosure will now provide a more detailed and specific description that will refer to the accompanying drawings. The drawings and specific descriptions of the drawings, as well as any specific or alternative embodiments discussed, are intended to be read in conjunction with the entirety of this disclosure. The face mask with adhesive elastic tape fasten may, however, be embodied in many different forms and should not be construed as being limited to the embodiments set forth herein; rather, these embodiments are provided by way of illustration only and so that this disclosure will be thorough, complete and fully convey understanding to those skilled in the art.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention will be described in greater detail with reference to the accompanying drawings which represent preferred embodiments thereof:

[0016] FIG. 1.—shows a 45-degree frontside of a face mask with an adhesive elastic tape fasten according to an exemplary embodiment.

[0017] FIG. 2.—shows a 45-degree frontside of a surgical face mask with removal tabs which is a part of one version of the of face mask with an adhesive elastic therapeutic tape fasten according to an exemplary embodiment.

[0018] FIG. 3.—shows a front view of an N-grade respirator face mask with an adhesive elastic therapeutic tape fasten which is alternative version of a four pieced form fasten according to an exemplary embodiment.

[0019] FIG. 4.—shows a side view of an N-grade surgical face mask with an elastic therapeutic tape fasten three pieced form particular version according to an exemplary embodiment.

[0020] FIG. 5.—shows a backside view of a face mask with an adhesive elastic therapeutic tape of an alternative one-piece form fasten according to an exemplary embodiment.

[0021] FIG. 6.—shows the ultrasonic lamination of isolation face mask layers with adhesive elastic tape fasten to make an ergonomic one-piece mask according to an exemplary embodiment.

DETAILED DESCRIPTION

[0022] In its most complete form according to an exemplary embodiment, the device is made up of the following components. These components are (1) face mask that is covering the face of the user that is constructed for the intended purpose of protecting the user's respiratory system. The face mask has ergonomic shaping for a comfortable fit and secure placement. (2) The complete perimeter of the face mask will have the adhesive elastic tape that is ergonomic shaped to hold properties and conform to the facial structure of the user. (3) Removal tabs are connected to points of the elastic tape opposing the face mask contact side. The adhesive elastic tape is bordering the face mask on the area of the face mask, where there is contact to the user's facial skin. The shaping of the adhesive elastic tape conforms with the face mask's configuration, providing sufficient material overlap for bonding. Furthermore, the shape of the adhesive elastic tape will have a thickness to maintain a tight grip and secure placement on the user's face with ergonomic fit attributes of facial structure.

[0023] It should further be noted that: face mask and tape bonding is with ultrasonic welding and lamination during construction to create a durable and secure connection of the material layers. The face mask material consists of but is not limited to, non-woven fabric, which has bacteria filtration efficiency and air permeability—masks made of polystyrene, polycarbonate, polyethylene, or polyester.

[0024] Mask described herein according to some embodiments can include, for example, a styrene-based polymer, an isoprene polymer, a low-density polyethylene copolymer, or mixtures thereof, and the like. Respiratory masks comprised of four layers of material: an outer layer of spun-bond polypropylene, the second layer of cellulose/polyester, the third layer of melt-blown polypropylene filter material and an inner (fourth) layer of spun-bound polypropylene. The adhesive elastic tape where joints are existing will be ultrasonically welded when more than one piece. The adhesive elastic tape material consists of but is not limited to a latex-free material with acrylic adhesive, which may be heat activated. The elastic is a non-linear elastic and porous

composite material. The fabric has a plain weave, and its backside is equipped with an adhesive. The tape properties include but are not limited to materials with air permeability, water vapor permeability, and thermophysical properties. The tape is a non-linear elastic and porous composite material. The fabric has a plain weave, and its backside is equipped with an adhesive. In a relaxed state, porosity, together with air permeability and other heat and mass transfer characteristics, is mainly affected by the compact layer of adhesive on the woven fabric's surface. During tension, pores are expanding, so the transfer of air and water vapor is significantly increased. At the same time, heat transfer is reduced, which can positively affect user comfort. Removal tabs are but not limited to the composition of lightweight, durable material polyester. The removal tabs are ultrasonically welded to the edge of the elastic tape facing away from the face mask bonded point.

[0025] The most complete form of performing a method according to an exemplary embodiment associated with the disclosed device consists of the following steps (1) the tape alignment markers placed in line with the bridge of the nose and upper jawbone. (2) the sequence of the removal of the elastic tape backside is three steps to make a tight and accurate face mask connected to the user's face. From point one, the center of nose alignment to the lower cheekbone, from point two centers of nose alignment to the opposite side lower cheekbone, from location three the lower chin line across from left to right of the face mask and facial contact line. It should be noted that: application of the face mask sequencing order of method can be from multiple starts to finish directions.

[0026] FIG. 1 shows a (1) face mask, and the fasten being (2) adhesive elastic tape that is (3) ultrasonically laminated to the backside of the face mask according to an exemplary embodiment. The backside is the side of the face mask that will contact the user's face, and the adhesive side of the fasten is the side facing away from the front of the mask. (3) the ultrasonic lamination and welds at the seams of the elastic partitions secure the fasten into a single unit. There are markings at the weld point for correct alignment with the face mask and user's face position.

[0027] FIG. 2 shows a (1) surgical face mask that is using (2) preferably adhesive elastic therapeutic tape as the fasten with an ergonomically shaped form for the facial structure of the user according to an exemplary embodiment. The fasten has an anchor and stretching properties that provide conforming shape to the facial features. There are porous attributes to the material which provide breathable comfort for the skin surface (3); there are the ultrasonic welds that attach the preferably adhesive elastic therapeutic tape to the backside of the surgical face mask creating a singular unit. There are (4) polyester removal tabs to easily and safe removal of the surgical mask.

[0028] FIG. 3 Shows the front view of an (1) N-grade respirator face mask with a fasten (2) adhesive elastic therapeutic tape and is four pieces ergonomically (3) ultrasonically welded to shape the face mask and the user's face according to an exemplary embodiment. The (1) preferably N-grade respirator face mask is (3) ultrasonically welded together with the (2) preferably adhesive elastic therapeutic tape fasten at the backside of the face mask. (4) preferably Polyester non-adhesive removal tabs.

[0029] FIG. 4 shows a side view (1) preferably an N-grade surgical face mask and (2) preferably elastic therapeutic tape

ergonomically shaped to a user's face according to an exemplary embodiment. (3) The ultrasonic welds and lamination around the complete perimeter of the face mask sealed the contact of the (2) elastic tape non-adhesive side to the face mask's frontside. This particular drawing is a three-piece welded fasten. The (4) removal tabs have markers to make alignment of the fasten to the user's facial points and for convenient removal of the face mask.

[0030] FIG. 5 shows a backside of (1) surgical mask (2) with one-piece ergonomic shaped fasten made preferably with elastic therapeutic adhesive tape (3) ultrasonic welded and ultrasonic laminated together with a face mask for an alternative version according to an exemplary embodiment.

[0031] FIG. 6 shows a (6) multilayer construction (1) face mask (2) with preferably adhesive elastic therapeutic tape (5) ultrasonically laminating face mask layers with elastic adhesive layer into one ergonomic shape to fit securely on a user's face and of an alternative version according to an exemplary embodiment.

[0032] In an exemplary embodiment, a face mask covering the face of a user has intended purpose of protecting the user's respiratory system. The face mask has ergonomic shaping for a comfortable fit and secure placement. The complete perimeter of the face mask has an adhesive elastic tape that is ergonomically shaped to hold properties and conform to the facial structure of the user. Removal tabs are connected to points of the elastic tape opposing the face mask contact side. The adhesive elastic tape is bordering the face mask on the area of the face mask, where there is contact to the user's facial skin. The shaping of the adhesive

elastic tape conforms with the face mask's configuration, providing sufficient material overlap for bonding. Furthermore, the shape of the adhesive elastic tape has a thickness to maintain a tight grip and secure placement on the user's face with ergonomic fit attributes of facial structure.

[0033] Different features, variations and multiple different embodiments have been shown and described with various details. What has been described in this application at times in terms of specific embodiments is done for illustrative purposes only and without the intent to limit or suggest that what has been conceived is only one particular embodiment or specific embodiments. It is to be understood that this disclosure is not limited to any single specific embodiments or enumerated variations. Many modifications, variations and other embodiments will come to mind of those skilled in the art, and which are intended to be and are in fact covered by this disclosure. For example, all combinations and permutations of the above-described features and embodiments may be utilized in conjunction with the invention. It is indeed intended that the scope of this disclosure should be determined by a proper legal interpretation and construction of the disclosure, including equivalents, as understood by those of skill in the art relying upon the complete disclosure present at the time of filing.

What is claimed is:

1. An apparatus as shown and described herein.
2. A system as shown and described herein.
3. A method as shown and described herein.

* * * * *