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(54) **NOSE BRIDGE FOR DISPOSABLE MASK AND METHOD FOR MANUFACTURING**

NASENBRÜCKE FÜR WEGWERFMASKE UND VERFAHREN ZUR HERSTELLUNG

PONT POUR MASQUE JETABLE ET PROCÉDÉ DE FABRICATION

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Description

BACKGROUND

[0001] Masks that promote breathing at least partially filtered air may be manufactured for use in a variety of environments. A mask may comprise non-woven material that covers the mouth and nose and that promotes breathing in air that is filtered by the non-woven material as it passes through the non-woven material. The mask may be intended for single use, for example use during a single eight hour work day, and to be disposed after the single use. Such single use masks may be used in healthcare service environments such as in hospitals, in automobile manufacturing environments, in light industry environments, in woodcraft environments, and in other environments. Such single use masks may be used by individuals for protecting themselves against exposure to contagious diseases and/or to protect others against exposure to a temporary illness of the user. Because these masks are single use items, manufacturing may be engineered to keep production costs low.

[0002] United States Patent 6394090 discloses a flat folded personal respiratory protection device, having a nosepiece made of formable material for example, a pliable dead-soft band of metal such as aluminum or plastic coated wire.

United Kingdom Patent application GB 2329128A discloses a nose clip for a respiratory mask in the form of a flattened strip of malleable material, the end regions of which are twisted to displace the upper edge of the strip

SUMMARY

[0003] The present invention is defined by the appended claims.

[0004] In an embodiment, a disposable mask is disclosed. The disposable mask comprises a fabric piece and a nose bridge comprising a metal strip enclosed in plastic, wherein the nose bridge is welded to the fabric piece.

[0005] In an embodiment, a method of manufacturing a disposable mask is disclosed. The method comprises placing a nose bridge in contact with a piece of non-woven fabric, wherein the nose bridge comprises plastic that encloses a metal strip, and ultrasonically welding the nose bridge to the piece of non-woven fabric.

[0006] These and other features will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] For a more complete understanding of the present disclosure, reference is now made to the following brief description, taken in connection with the accompanying drawings and detailed description, wherein like

reference numerals represent like parts.

FIG. 1A is an illustration of a disposable mask according to an embodiment of the disclosure.

FIG. 1B is an illustration of another disposable mask according to an embodiment of the disclosure.

FIG. 2A, FIG. 2B, FIG. 2C, FIG. 2D, FIG. 2E, and FIG. 2F, are examples of prior art. FIG. 2G, FIG. 2H, and FIG. 2I are illustrations of several alternative nose bridges according to an embodiment of the disclosure.

FIG. 3A is an illustration of a disposable mask folded flat for shipping according to an embodiment of the disclosure.

FIG. 3B is an illustration of the disposable mask folded open according to an embodiment of the disclosure.

FIG. 4A is an illustration of a direct inlay ultrasonic welding system according to an embodiment of the disclosure.

FIG. 4B is an illustration of an indirect inlay ultrasonic welding system according to an embodiment of the disclosure.

FIG. 5 is a flow chart of a method according to an embodiment of the disclosure.

FIG. 6A, FIG. 6B, FIG. 6C, and FIG. 6D are illustrations of several alternative nose bridges according to an embodiment of the disclosure.

DETAILED DESCRIPTION

[0008] It should be understood at the outset that although illustrative implementations of one or more embodiments are illustrated below, the disclosed systems and methods may be implemented using any number of techniques, whether currently known or not yet in existence. The disclosure should in no way be limited to the illustrative implementations, drawings, and techniques illustrated below, but may be modified within the scope of the appended claims along with their full scope of equivalents.

[0009] Turning now to FIG. 1A, a first disposable mask 100 is described. In an embodiment, the first disposable mask 100 comprises a piece of non-woven fabric 102 and a nose bridge 104 that is ultrasonically welded to the piece of non-woven fabric 102. The piece of non-woven fabric 102 may be made by a variety of processes including needle punch fabric making processes, spunbond fabric making processes, and other fabric making processes. The piece of non-woven fabric 102 may comprise a variety of materials, for example polyester fibers, polypropylene fibers, and/or other fibers. The non-woven fabric 102 may filter the air breathed by a user wearing the mask to remove particulate matter.

[0010] The piece of non-woven fabric 102 may be formed into a bowl-like shape that generally conforms to the lower half of a human face, for example to a nose and mouth of a human face. The first disposable mask

100 may further comprise one or more straps to secure the mask to the face of a user. In an embodiment, the first disposable mask may have an exhalation valve that improves the comfort of the user during exhalation, as exhaled breath may pass out of the exhalation valve more readily.

[0011] The first disposable mask 100 may be donned by a user, and the user may bend the nose bridge 104 to fit or conform to the nose and/or face of the user, for example to promote substantially closing a gap between the edges of the piece of non-woven fabric 102 and the cheeks of the user. The user may bend the nose bridge 104 to achieve a comfort of the user or to improve a field of vision of the user or to achieve other purposes of the user. The nose bridge 104 is fabricated to substantially maintain the form or shape that the user bends it into under conditions of normal use. In an embodiment, the nose bridge 104 may be bent into an arched form during the manufacturing process. This may be referred to in some contexts as pre-bending the nose bridge 104. In an embodiment, the user may further bend the nose bridge 104 to adapt the fit and feel of the mask 100 to the user's needs and/or particular facial configuration. Additionally, the nose bridge 104 may be folded or twisted during manufacturing to provide improved fit and form. Folded, twisted, and/or bent nose bridges are described further hereinafter with reference to FIG. 6A, FIG. 6B, FIG. 6C, and FIG. 6D.

[0012] Turning now to FIG. 1B, a second disposable mask 110 is described. In an embodiment, the second disposable mask 110 comprises a piece of non-woven fabric 112 and a nose bridge 114 that is ultrasonically welded to the piece of non-woven fabric 112. The second disposable mask 110 is substantially similar to the first disposable mask 100, with the exception that the piece of non-woven fabric 102 has a different shape and extent than the piece of non-woven fabric 112. It is understood that the present disclosure contemplates applying the teachings presented herein to a variety of differently shaped pieces of non-woven fabric. In an embodiment, the nose bridge 114 may be bent by the user to make the mask 110 fit or conform to the nose and/or face of the user. In an embodiment, the nose bridge 114 may be bent into an arched form during the manufacturing process, which may be referred to as pre-bending the nose bridge 114. The user may further bend the nose bridge 114 to accommodate his or her preferences and/or facial configuration. In either of the masks 100, 110, the nose bridge 104, 114 may be pre-bent to a shape that promotes ease of packing for shipment and/or storage, and the nose bridge 104, 114 may then be bent by a user when putting the mask 100, 110 into service.

[0013] Turning now to FIG. 2A, FIG. 2B, FIG. 2C, FIG. 2D, FIG. 2E, FIG. 2F, FIG. 2G, FIG. 2H, and FIG. 2I a number of alternative nose bridges 140, 150, 160, 170, 176, 190, 300, 310, and 320 are described. Each of FIG. 2A, FIG. 2B, FIG. 2C, FIG. 2D, FIG. 2E, FIG. 2F, FIG. 2G, FIG. 2H, and FIG. 2I show a cross section view of a

nose bridge viewed on edge comprised of a metal strip and a plastic capsule. The metal may be aluminum or another metal. The plastic capsule may comprise polypropylene, polyester, or another type of plastic. It is understood that the lower face and/or the upper face of the pictured nose bridges may be ultrasonically welded to the piece of non-woven fabric to make a disposable mask.

[0014] A nose bridge 140 comprises a plastic capsule 142 and a metal strip 144. The plastic capsule 142 extends beyond the ends of the metal strip 144 about equally. A nose bridge 150 comprises a plastic capsule 152 and a metal strip 154. The plastic capsule 152 may extend further beyond both side edges of the metal strip 154 than it extends beyond either the top edge or the bottom edge of the metal strip 154. A nose bridge 160 comprises a plastic capsule 162 and a metal strip 164. The plastic capsule 162 extends more beyond the top edge than beyond the bottom edge and the side edges of the metal strip 164. Alternatively, the plastic capsule 162 extends more beyond the bottom edge than beyond the top edge and the side edges of the metal strip 164. A nose bridge 170 comprises a plastic capsule 172 and a metal strip 174. The plastic capsule 172 and the metal strip 174 may have generally rectangular shapes with rounded corners. A nose bridge 176 comprises a plastic capsule 177 and a metal strip 178. A nose bridge 190 comprises a plastic capsule 192 and a metal strip 194.

[0015] The nose bridges 104, 114 used with the disposable masks 100, 110, 180 may be manufactured in conformance with any of the designs of nose bridges 140, 150, 160, 170, 176, 190, 300, 310, 320, or with other designs. The different amount of extension of plastic beyond the edges of the metal strip may provide different levels of security of attachment of the nose bridge to the piece of non-woven fabric or other advantages in different use environments. The plastic may be extruded over the metal strip. Alternatively, the plastic may be laminated over the metal strip, for example the metal may be placed between two separate pieces of plastic and the two pieces of plastic may be pressed together and heated to cause the two pieces of plastic to adhere to each other, at least around the edge of the metal strip. In some embodiments the lamination may employ an adhesive between the two pieces of plastic, but in other embodiments the lamination may be performed without a separate adhesive material and may rely upon the two plastic surfaces coupling to each other as a result of the heat and pressure. In an embodiment, the plastic may be molded over the metal strip.

[0016] The thickness of the plastic over the metal strip 144, 154, 164, 174, 178, 194 may be in the range from about 0.15 mm thick to about 0.65 mm thick. As one example, the plastic thickness can be seen at reference point G in FIG. 2E and in FIG. 2F. The thickness of the plastic over the metal strip 144, 154, 164, 174, 178, 194 may be in the range from about 0.20 mm thick to about 0.50 mm thick. The thickness of the plastic over the metal

strip 144, 154, 164, 174, 178, 194 may be in the range from 0.25 mm thick to 0.40 mm thick. In some embodiments, the thickness of the plastic over the metal strip 144, 154, 164, 174, 178, 194 may influence the quality of the bond between the nose bridge 140, 150, 160, 170, 176, 190 and the piece of non-woven fabric 102, 112 that inlay ultrasonic welding can produce.

[0017] The plastic capsule 142, 152, 162, 172, 177, 192 is color coded to indicate a usage class or usage category of the disposable mask 100, 110, 180. For example, the plastic capsule 142, 152, 162, 172, 177, 192 may be colored yellow to indicate an FFP1 particulate filtration level (filtering out about 80% of particulate matter), colored green to indicated an FFP2 particulate filtration level (filtering out about 94% of particulate matter), and orange to indicate an FFP3 particulate filtration level (filtering out about 99% of particulate matter). The yellow, green, and orange color of plastic capsule may designate other different usage classes or usage categories. The plastic capsule may be colored blue or red to indicate special usage classes or usage categories. The plastic may also be used to display a brand or product name or logo, for example by providing an impression in the plastic, by painting on the plastic, by etching the plastic, by ultrasonically welding to form an image in the plastic, and/or by capturing a printed message within the plastic capsule. In some industries it is undesirable and/or forbidden to have exposed metal on disposable masks 100, 110. By encapsulating the metal strip in plastic this criteria may be satisfied.

[0018] The use of a metal strip 144, 154, 164, 174, 178, 194, 304, 314, 324 may promote distributing a load or pressure from the piece of non-woven fabric 102, 112 to the face of the user of the disposable mask 100, 110, 180, thereby reducing the irritation or pain felt by the user of the disposable mask 100, 110, 180. For example, the use of a metal strip may distribute the load over a larger area of facial skin than would be the case if an equivalent wire were employed to make the nose bridge 140, 150, 160, 170, 176, 190, 300, 310, 320.

[0019] The metal strip in any of the nose bridges 104, 114, 140, 150, 160, 170 described above may be made of aluminum, steel, or other metals. In an example, the mechanical properties of aluminum provide a good combination of bendability combined with the ability of holding a form after bending. In an example, the metal strip 144, 154, 164, 174, 178, 194 is in the range from about 0.35 mm thick to about 1.5 mm thick. In another example, the metal strip 144, 154, 164, 174, 178, 194 is in the range from about 0.5 mm thick to about 1.0 mm thick. In an example, the metal strip 144, 154, 164, 174, 178, 194 is in the range from about 2 mm wide to about 12 mm wide. In an example, the metal strip 144, 154, 164, 174, 178, 194 is in the range from about 4 mm wide to about 7 mm wide.

[0020] In an example, the plastic may be extruded over the metal strip to produce an extended roll of material. The roll of material may be produced by a first manufac-

turer, and a second manufacturer may purchase the roll of material, cut nose bridges from the roll of material, and assemble the disposable mask 100, 110, 180 using these cut nose bridges. The nose bridges may be cut from the roll of material to form nose bridges of different lengths to be used in making different kinds and/or different sizes of disposable masks 100, 110, 180.

[0021] In some examples, it is desirable to keep manufacturing costs of the disposable masks 100, 110, 180 low. Aluminum or other metals may be relatively expensive, and to reduce manufacturing costs the shape of the metal strip 144, 154, 164, 174, 178, 194 may be modified to reduce the amount of metal used. The thickness of the metal strip is greater in a middle of the nose bridge and thinner near an edge of the nose bridge. A nose bridge 300 may comprise a metal strip 304 encapsulated in a plastic capsule 302. A nose bridge 310 may comprise a metal strip 314 encapsulated in a plastic capsule 312. A nose bridge 320 may comprise a metal strip 324 encapsulated in a plastic capsule 322. Each of the nose bridges 300, 310, 320 comprise a metal strip 304, 314, 324 that may use a reduced amount of aluminum relative to the nose bridges 140, 150, 160, 170, 176, 190 described above. The plastic capsule is color coded as described above. The plastic capsule may comprise polypropylene, polyester, or another type of plastic. The nose bridges 300, 310, 320 may be formed by extruding the plastic over the metal strips, by molding the plastic over the metal strips, or by injecting the plastic over the metal strips.

[0022] It will be appreciated that any of the variations of nose bridges 104, 114, 300, 310, 320 described above may be coupled to any of the pieces of non-woven fabric 102, 112 described above to form a disposable mask 100, 110, 180 according to the teachings of the present disclosure.

[0023] Turning now to FIG. 3A and FIG. 3B, a disposable mask 180 is described. The disposable mask 180 is manufactured in a manner that promotes folding and shipping the disposable mask 180 flat. In an embodiment, the disposable mask 180 may be cut from a single piece of non-woven fabric and the nose bridge 300, 310, 320 may be ultrasonically welded onto the non-woven fabric. Portions of the disposable mask 180 may be coupled to itself to form a lower portion of the disposable mask 180 and generally provide a form suitable for fitting to a face of a user. The non-woven fabric may be coupled together along a curve or along a curved path by ultrasonic welding, by gluing, or by other coupling structures over a portion of the front center of the disposable mask 180, for example a lower area that corresponds to a chin and mouth area of a user. Upon coupling, the non-woven fabric beyond the curved coupling area may then be cut off or trimmed off. The disposable mask 180 may have bands that pass behind the head of the user and hold the disposable mask 180 in place. The non-woven fabric may have cut outs to make room for ears of a user. FIG. 3B shows a view from the inside of the disposable mask 180 from the view point of a user who may don the dis-

posable mask 180. In an embodiment, when the disposable mask 180 is manufactured, the nose bridge 300, 310, 320 may be folded down to make the disposable mask 180 lie flatter to promote ease of packaging for shipment and/or for storage.

[0024] Turning now to FIG. 4A, a first inlay ultrasonic welding system 200 is described. In an embodiment, the system 200 comprises an ultrasonic device 202, positioned proximate to and in intimate contact with a piece of non-woven fabric 204. The piece of non-woven fabric 204 is also in intimate contact with a nose bridge 206 that comprises a metal strip encapsulated in plastic substantially similar to the nose bridges 300, 310, 320 described above. When the ultrasonic device 202 transfers ultrasonic energy to the piece of non-woven fabric 204, the non-woven fabric 204 and the nose bridge 206 are bonded at least in some locations with a solid-state weld. In an embodiment, the system 200 may hold the piece of non-woven fabric 202 in contact with the nose bridge 206 under pressure. In an embodiment, the inlay ultrasonic welding may be conducted using a 20 kHz frequency, but in other embodiments other frequencies of inlay ultrasonic welding may be employed. The process of inlay ultrasonic welding to couple the nose bridge 206 to the piece of non-woven fabric 204 may be used to manufacture disposable masks 100, 110, 180 when gluing a metal strip to the piece of non-woven fabric 204 is unfeasible or may be undesirably expensive to manufacture. The process of inlay ultrasonic welding provided by the first ultrasonic welding system 200 may be referred to in some contexts as direct ultrasonic welding or direct inlay ultrasonic welding.

[0025] Turning now to FIG. 4B, a second ultrasonic welding system 220 is described. In an embodiment, the system 220 comprises the ultrasonic device 202, a nose bridge 224 that comprises a metal strip encapsulated in plastic substantially similar to the nose bridges 300, 310, 320 described above, and a piece of non-woven fabric 222. In system 220, the inlay ultrasonic welding proceeds by an indirect process. Energy is transferred from the ultrasonic device 202 to a surface of the nose bridge 224, the energy is propagated from an upper surface of plastic to the metal strip to a lower surface of plastic of the nose bridge 224, and the lower surface of plastic bonds to the piece of non-woven fabric 222. The process of inlay ultrasonic welding to couple the nose bridge 224 to the piece of non-woven fabric 222 may be used to manufacture disposable masks 100, 110, 180 when gluing a metal strip to the piece of non-woven fabric 222 is unfeasible. The process of inlay ultrasonic welding 10 provided by the second ultrasonic welding system 220 may be referred to in some contexts as indirect ultrasonic welding or indirect inlay ultrasonic welding.

[0026] Turning now to FIG. 5, a method 280 is described. At block 282, plastic is extruded over a metal strip to form a nose bridge material, for example a semi-continuous roll of nose bridge material. Alternatively, the plastic may be laminated over the metal strip to form the

nose bridge material. Alternatively, the plastic may be molded over the metal strip to form the nose bridge material, for example the plastic is injected around the metal strip. In an embodiment, the nose bridge may be bought from a vendor, and the method 280 may omit block 282. At block 284, the nose bridge material is cut to form a nose bridge or a plurality of nose bridges. For example, one or more nose bridges are cut from a semi-continuous roll of nose bridge material. In an embodiment in which the plastic is molded around the metal strip, the nose bridge may already be formed separately, and the step of cutting the nose bridge from a semi-continuous roll or nose bridge material may be omitted.

[0027] At block 286, the nose bridge is optionally twisted, folded, and/or bent to promote shaping the face mask in more than one dimension. In some embodiments, the processing of block 286 is not performed in making the face mask. At block 288, the nose bridge is placed in contact with a piece of non-woven fabric. At block 290, the nose bridge is ultrasonically welded to the piece of non-woven fabric. Alternatively, in a non-claimed embodiment, the nose bridge may be glued to the piece of non-woven fabric.

[0028] Turning now to FIG. 6A, FIG. 6B, FIG. 6C, and FIG. 6D, nose bridges that are formed in part by twisting, folding, and/or bending are described. The nose bridges in FIG. 6A, FIG. 6B, FIG. 6C, and FIG. 6D may be said to promote shaping the face mask 100, 110, 180 in more than one dimension.

[0029] Nose bridge 400 illustrated in FIG. 6A may be formed as any of the nose bridges 140, 150, 160, 170, 176, 190, 300, 310, 320 described above, but further comprising a first twist and fold 402 creating a first branch 406 and a second twist and fold 404 creating a second branch 408. The nose bridge 400 may be bent to conform the face mask in two dimensions. The nose bridge 400 may be bent along the straight section of the middle of the nose bridge 400 to conform the face mask in a first area and may be bent along either of the branches 406, 408 to conform the face mask in a second area.

[0030] Nose bridge 420 illustrated in FIG. 6B may be formed as any of the nose bridges 140, 150, 160, 170, 176, 190, 300, 310, 320 described above, but further comprising a third twist and fold 422 in the center of the nose bridge 420 that divides the nose bridge 420 into a third branch 424 and a fourth branch 426. The nose bridge 420 may be bent to conform the face mask to the user's face in two areas.

[0031] Nose bridge 440 illustrated in FIG. 6C may be formed as any of the nose bridges 140, 150, 160, 170, 176, 190, 300, 310, 320 described above, but further comprising a first bend 442 creating a fifth branch 446 and a second bend 444 creating a sixth branch 448. The nose bridge 440 may be bent along the straight section of the middle of the nose bridge 440 to conform the face mask in a first area and may be bent along either of the branches 446, 448 to conform the face mask in a second area.

[0032] Nose bridge 460 illustrated in FIG. 6D may be formed as any of the nose bridges 140, 150, 160, 170, 176, 190, 300, 310, 320 described above, but further comprising a first cut 462 and a third bend 464 creating a seventh branch 466 and an eighth branch 468. The first cut 462 may remove a wedge-like portion of the nose bridge material to promote ease of forming the third bend 464. The nose bridge 460 may be bent to conform the face mask to the user's face in two areas.

[0033] The present invention in its various aspects is as set out in the appended claims.

Claims

1. A disposable mask (100, 110, 180), comprising:

a non-woven fabric piece (102, 112) operable to filter air to remove particulate matter; and a nose bridge (104, 114, 300, 310, 320, 400, 420, 440, 460)

wherein the nose bridge (104, 114, 300, 310, 320, 400, 420, 440, 460) is welded to the fabric piece (102, 112);

wherein the non-woven fabric has a usage class, or usage category; and

characterized in that:

the nose bridge (104, 114, 300, 310, 320, 400, 420, 440, 460)

comprises a metal strip (304, 314, 324) enclosed in plastic (302, 312, 322);

wherein the plastic (302, 312, 322) of the nose bridge is color

coded to correspond to at least one of the usage class or the usage category; and wherein the metal strip 304, 314, 324) has a thickness that is

greater in the middle of the nose bridge and thinner near an edge of the nose bridge.

2. The disposable mask (100, 110, 180) of claim 1, wherein the plastic (302, 312, 322) is one of extruded over the metal strip (304, 314, 324), molded over the metal strip (304, 314, 324), or laminated over the metal strip (304, 314, 324).

3. The disposable mask (100, 110, 180) of claim 1, wherein the metal strip (304, 314, 324) comprises aluminum, and wherein the plastic (302, 312, 322) enclosing the metal strip (304, 314, 324) is about 0.15 mm thick to about 0.65 mm thick.

4. The disposable mask (100, 110, 180) of claim 1, wherein the metal strip (304, 314, 324) comprises aluminum, and wherein the metal strip (304, 314, 324) is about 2 mm to about 12 mm wide.

5. The disposable mask (100, 110, 180) of claim 1, wherein the metal strip (304, 314, 324) comprises aluminum, and wherein the nose bridge (300, 310, 320, 400, 420, 440, 460) is welded to the fabric piece (102, 112) using at least one of direct inlay ultrasonic welding or indirect inlay ultrasonic welding.

6. The disposable mask (100, 110, 180) of claim 1, wherein the plastic of the nose bridge comprises an etching in the plastic.

7. The disposable mask (100, 110, 180) of claim 1, wherein the nose bridge (400, 420) comprises at least one twist and fold (402, 404) to form at least two branches (406, 408, 424, 426) of the nose bridge (400, 420) to promote conforming the disposable mask (100, 110, 180) to a user's face in more than one dimension.

8. The disposable mask (100, 110, 180) of claim 1, wherein the plastic (302, 312, 322) of the nose bridge (300, 310, 320, 400, 420, 440, 460) comprises at least one of polypropylene or polyester.

9. A method of manufacturing a disposable mask (100, 110, 180), comprising:

providing a piece of non-woven fabric operable to filter air to remove particulate matter; placing a nose bridge (104, 114, 300, 310, 320, 400, 420, 440, 460) in contact with the piece of non-woven fabric (102, 112), wherein the nose bridge comprises plastic (302, 312, 322) that encloses a metal strip (304, 314, 324); and ultrasonically welding the nose bridge (104, 114, 300, 310, 320, 400, 420, 440, 460) to the piece of non-woven fabric (102, 112);

characterized in that

the plastic of the nose bridge is color coded to correspond to at least one of the usage class or the usage category; and wherein the metal strip (304, 314, 324) has a thickness that is greater in the middle of the nose bridge and thinner near an edge of the nose bridge.

10. The method of claim 9, further comprising etching the plastic of the nose bridge.

11. The method of claim 9, wherein the nose bridge (104, 114, 300, 310, 320, 400, 420, 440, 460) is welded to the piece of non-woven fabric (102, 112) by using at least one of direct inlay ultrasonic welding or indirect inlay ultrasonic welding. 5
12. The method of claim 9, further comprising folding and twisting the nose bridge (400, 420) to form at least two branches (406, 408, 424, 426). 10

Patentansprüche

1. Wegwerfmaske (100, 110, 180), umfassend: 15
- ein Vliestextilteil (102, 112), das funktional ist, um Luft zu filtern, um teilchenförmiges Material zu entfernen; und
- eine Nasenbrücke (104, 114, 300, 310, 320, 400, 420, 440, 460), wobei die Nasenbrücke (104, 114, 300, 310, 320, 400, 420, 440, 460) an das Textilteil (102, 112) geschweißt ist; wobei das Vliestextil eine Nutzungsklasse oder Nutzungskategorie aufweist, und **dadurch gekennzeichnet ist, dass:** 20
- die Nasenbrücke (104, 114, 300, 310, 320, 400, 420, 440, 460) einen Metallstreifen (304, 314, 324) umfasst, der in Kunststoff (302, 312, 322) eingeschlossen ist; wobei der Kunststoff (302, 312, 322) der Nasenbrücke farbkodiert ist, um mindestens einer von der Nutzungsklasse oder der Nutzungskategorie zu entsprechen; und 25
- wobei der Metallstreifen (304, 314, 324) eine Dicke hat, die in der Mitte der Nasenbrücke größer ist und nahe einem Rand der Nasenbrücke dünner ist. 30
2. Wegwerfmaske (100, 110, 180) nach Anspruch 1, wobei der Kunststoff (302, 312, 322) eines von über den Metallstreifen (304, 314, 324) extrudiert, über den Metallstreifen (304, 314, 324) geformt oder über den Metallstreifen (304, 314, 324) laminiert ist. 35
3. Wegwerfmaske (100, 110, 180) nach Anspruch 1, wobei der Metallstreifen (304, 314, 324) Aluminium umfasst, und wobei der Kunststoff (302, 312, 322), der den Metallstreifen (304, 314, 324) einschließt, etwa 0,15 mm dick bis etwa 0,65 mm dick ist. 40
4. Wegwerfmaske (100, 110, 180) nach Anspruch 1, wobei der Metallstreifen (304, 314, 324) Aluminium umfasst, und wobei der Metallstreifen (304, 314, 324) etwa 2 mm bis etwa 12 mm breit ist. 45
5. Wegwerfmaske (100, 110, 180) nach Anspruch 1,

wobei der Metallstreifen (304, 314, 324) Aluminium umfasst, und wobei die Nasenbrücke (300, 310, 320, 400, 420, 440, 460) unter Verwendung von mindestens einem von direktem Inlay-Ultraschallschweißen oder indirektem Inlay-Ultraschallschweißen an das Textilteil (102, 112) geschweißt ist.

6. Wegwerfmaske (100, 110, 180) nach Anspruch 1, wobei der Kunststoff der Nasenbrücke eine Ätzung in dem Kunststoff umfasst. 50
7. Wegwerfmaske (100, 110, 180) nach Anspruch 1, wobei die Nasenbrücke (400, 420) mindestens ein Verdrehen und Falten (402, 404) umfasst, um mindestens zwei Zweige (406, 408, 424, 426) der Nasenbrücke (400, 420) zu bilden, um das Anpassen der Wegwerfmaske (100, 110, 180) an das Gesicht eines Benutzers in mehr als einer Dimension zu begünstigen.
8. Wegwerfmaske (100, 110, 180) nach Anspruch 1, wobei der Kunststoff (302, 312, 322) der Nasenbrücke (300, 310, 320, 400, 420, 440, 460) mindestens eines von Polypropylen oder Polyester umfasst.
9. Verfahren zum Fertigen einer Wegwerfmaske (100, 110, 180), umfassend:
- Bereitstellen eines Teils aus Vliestextil, das funktional ist, um Luft zu filtern, um teilchenförmiges Material zu entfernen;
- Platzieren einer Nasenbrücke (104, 114, 300, 310, 320, 400, 420, 440, 460) in Kontakt mit dem Teil des Vliestextils (102, 112), wobei die Nasenbrücke Kunststoff (302, 312, 322) umfasst, das einen Metallstreifen (304, 314, 324) einschließt; und
- Ultraschallschweißen der Nasenbrücke (104, 114, 140, 150, 160, 170, 176, 190, 300, 310, 320, 400, 420, 440, 460) an das Teil des Vliestextils (102, 112); **dadurch gekennzeichnet, dass**
- der Kunststoff der Nasenbrücke farbcodiert ist, um mindestens einer von der Nutzungsklasse oder der Nutzungskategorie zu entsprechen; und
- wobei der Metallstreifen (304, 314, 324) eine Dicke hat, die in der Mitte der Nasenbrücke größer ist und nahe dem Rand der Nasenbrücke dünner ist.
10. Verfahren nach Anspruch 9, ferner umfassend Ätzen des Kunststoffs der Nasenbrücke.
11. Verfahren nach Anspruch 9, wobei die Nasenbrücke (104, 114, 300, 310, 320, 400, 420, 440, 460) an das Teil aus Vliestextil (102, 112) geschweißt wird, indem mindestens eines von direktem Inlay-Ultra-

schallschweißen oder indirektem Inlay-Ultraschall-schweißen verwendet wird.

12. Verfahren nach Anspruch 9, ferner umfassend Falten und Verdrehen der Nasenbrücke (400, 420), um mindestens zwei Zweige (406, 408, 424, 426) zu bilden.

Revendications

1. Masque jetable (100, 110, 180), comprenant :

un morceau de tissu (102, 112) non-tissé servant à filtrer l'air pour éliminer les particules ; et une barrette nasale (104, 114, 300, 310, 320, 400, 420, 440, 460),

dans lequel la barrette nasale (104, 114, 300, 310, 320, 400, 420, 440, 460) est soudée au morceau de tissu (102, 112) ;

dans lequel le tissu non-tissé a une classe d'usage, ou catégorie d'usage, et

caractérisé en ce que la barrette nasale (104, 114, 300, 310, 320, 400, 420, 440, 460) comprend une bande métallique (304, 314, 324) noyée dans du plastique (302, 312, 322),

dans lequel le plastique (302, 312, 322) de la barrette nasale a un codage couleur pour correspondre à la classe d'usage et/ou la catégorie d'usage ; et

dans lequel la bande métallique (304, 314, 324) a une épaisseur qui est plus importante au milieu de la barrette nasale et plus mince près d'un bord de la barrette nasale.

2. Masque jetable (100, 110, 180) selon la revendication 1, dans lequel le plastique (302, 312, 322) est soit extrudé sur la bande métallique (304, 314, 324), soit moulé sur la bande métallique (304, 314, 324), soit laminé sur la bande métallique (304, 314, 324).

3. Masque jetable (100, 110, 180) selon la revendication 1, dans lequel la bande métallique (304, 314, 324) est constituée d'aluminium, et dans lequel le plastique (302, 312, 322) entourant la bande métallique (304, 314, 324) a une épaisseur allant d'environ 0,15 mm à environ 0,65 mm.

4. Masque jetable (100, 110, 180) selon la revendication 1, dans lequel la bande métallique (304, 314, 324) est constituée d'aluminium, et dans lequel la bande métallique (304, 314, 324) a une largeur allant d'environ 2 mm à environ 12 mm.

5. Masque jetable (100, 110, 180) selon la revendication 1, dans lequel la bande métallique (304, 314, 324) est constituée d'aluminium, et dans lequel la barrette nasale (300, 310, 320, 400, 420, 440, 460)

est soudée au morceau de tissu (102, 112) au moyen d'un soudage par ultra-sons en incrustation directe et/ou d'un soudage par ultra-sons en incrustation indirecte.

6. Masque jetable (100, 110, 180) selon la revendication 1, dans lequel le plastique de la barrette nasale comprend une gravure dans le plastique.

7. Masque jetable (100, 110, 180) selon la revendication 1, dans lequel la barrette nasale (400, 420) comprend au moins une torsion-plier (402, 404) pour constituer au moins deux branches (406, 408, 424, 426) de la barrette nasale (400, 420) afin de favoriser l'adaptation du masque jetable (100, 110, 180) au visage de l'utilisateur dans plus d'une dimension.

8. Masque jetable (100, 110, 180) selon la revendication 1, dans lequel le plastique (302, 312, 322) de la barrette nasale (300, 310, 320, 400, 420, 440, 460) comprend du propylène et/ou du polyester.

9. Procédé de fabrication d'un masque jetable (100, 110, 180) comprenant les opérations consistant à :

produire un morceau de tissu non-tissé servant à filtrer l'air pour éliminer les particules ;

placer une barrette nasale (104, 114, 300, 310, 320, 400, 420, 440, 460) en contact avec le morceau de tissu (102, 112) non-tissé,

dans lequel la barrette nasale comprend du plastique (302, 312, 322) qui entoure une bande métallique (304, 314, 324) ; et

souder par ultra-sons la barrette nasale (104, 114, 140, 150, 160, 170, 176, 190, 300, 310, 320, 400, 420, 440, 460) au morceau de tissu (102, 112) non-tissé, **caractérisé en ce que** le plastique de la barrette nasale a un codage couleur pour correspondre à la classe d'usage et/ou la catégorie d'usage, et

dans lequel la bande métallique (304, 314, 324) a une épaisseur qui est plus importante au milieu de la barrette nasale et plus mince près d'un bord de la barrette nasale.

10. Procédé selon la revendication 9, comprenant en outre l'opération consistant à graver le plastique de la barrette nasale.

11. Procédé selon la revendication 9, dans lequel la barrette nasale (104, 114, 300, 310, 320, 400, 420, 440, 460) est soudée au morceau de tissu (102, 112) au moyen d'un soudage par ultra-sons en incrustation directe et/ou d'un soudage par ultra-sons en incrustation indirecte.

12. Procédé selon la revendication 9, comprenant en outre l'opération consistant à tordre et plier la bar-

rette nasale (400, 420) pour constituer au moins deux branches (406, 408, 424, 426).

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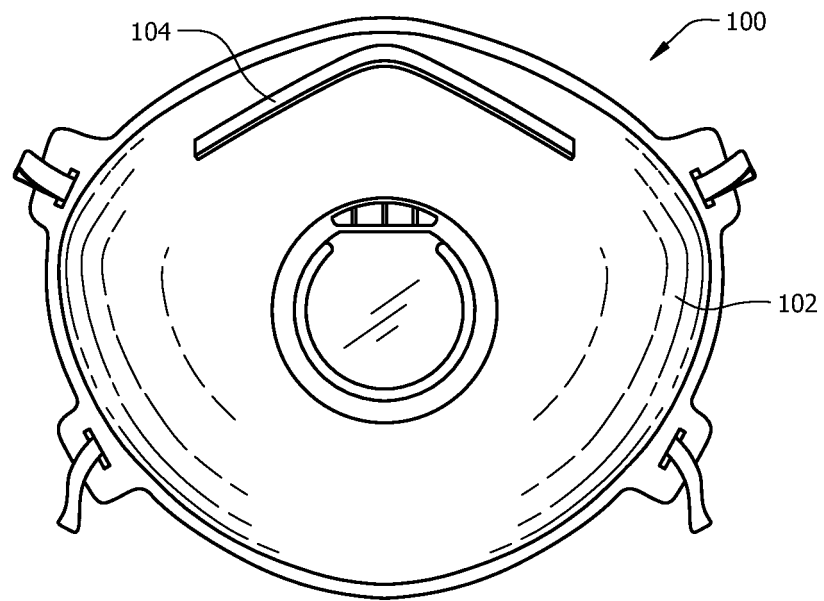


FIG. 1A

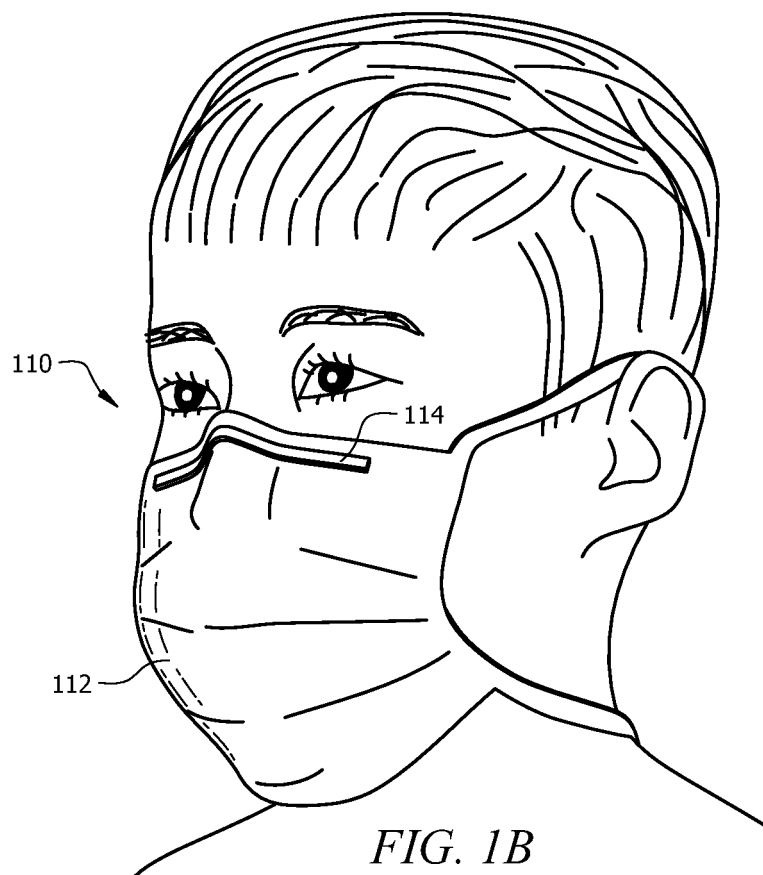


FIG. 1B

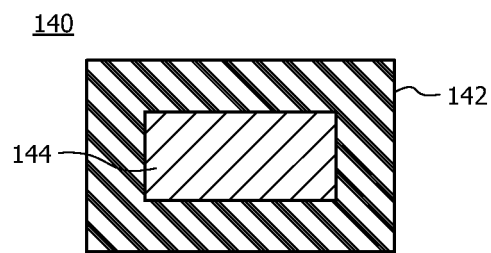


FIG. 2A

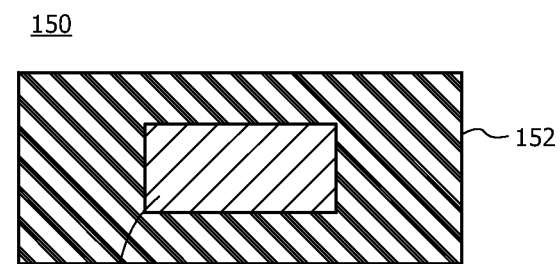


FIG. 2B

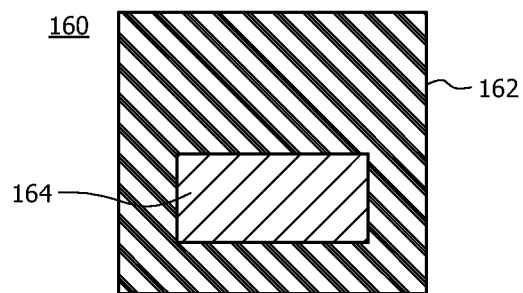


FIG. 2C

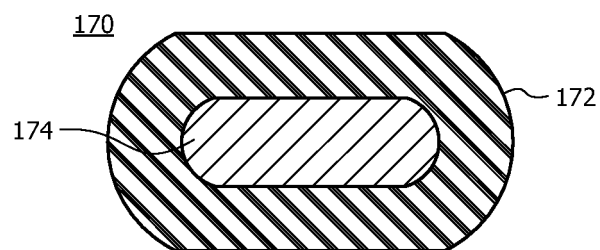
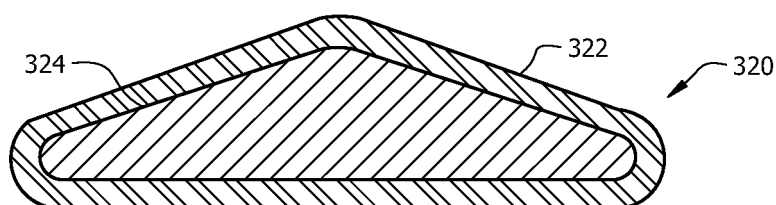
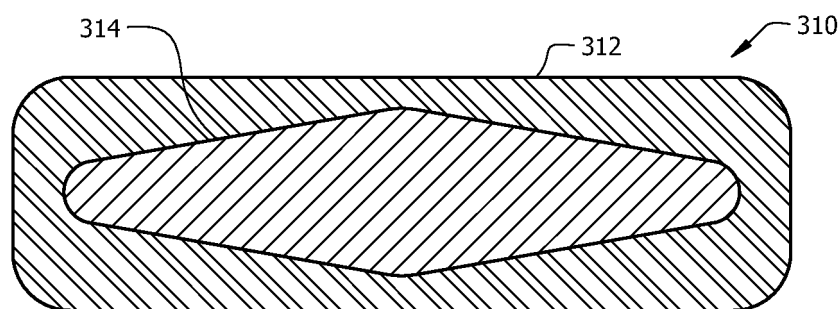
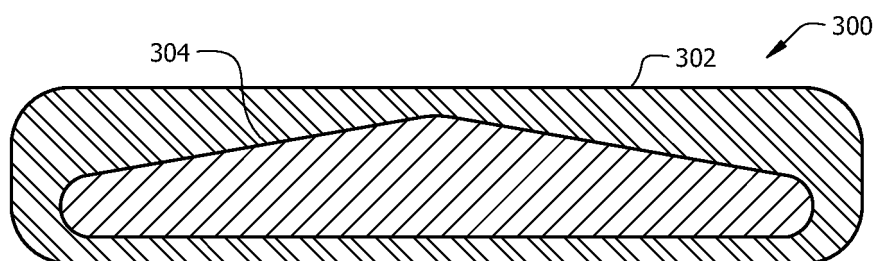
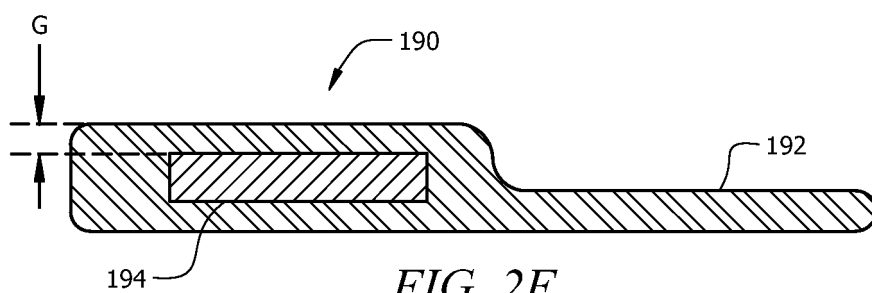
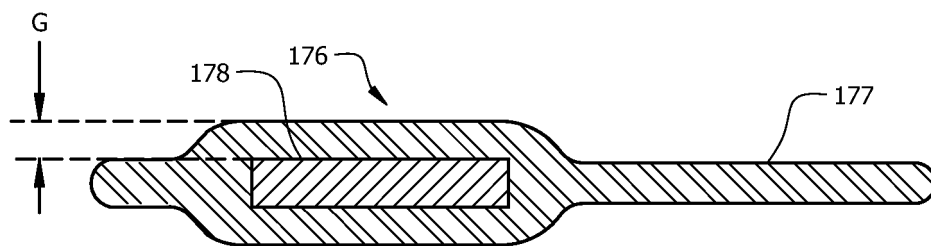


FIG. 2D



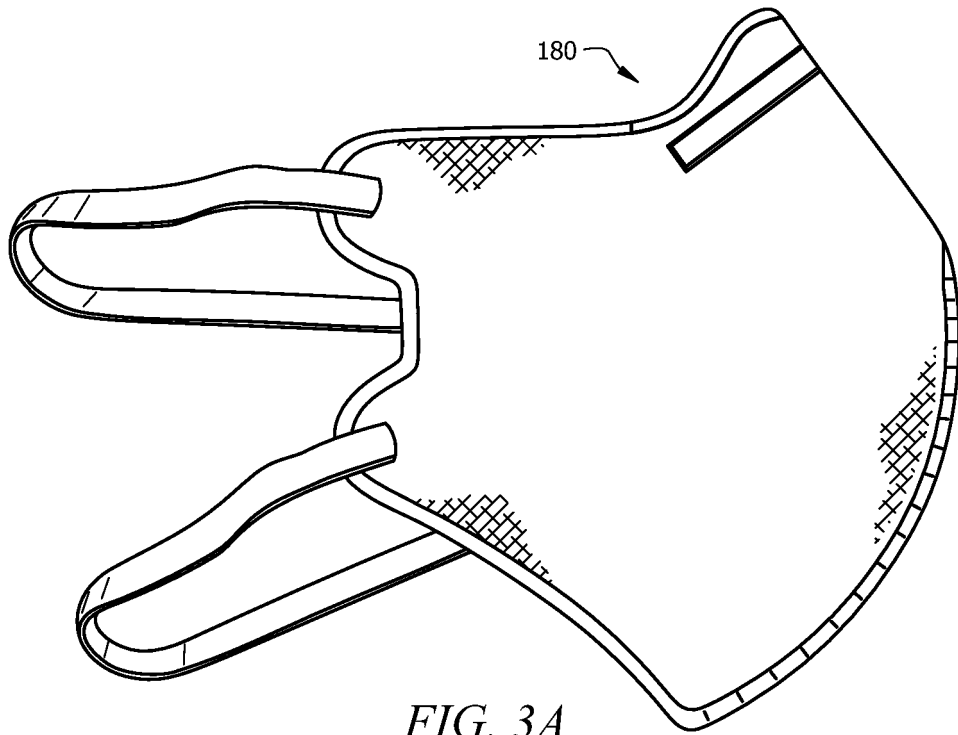


FIG. 3A

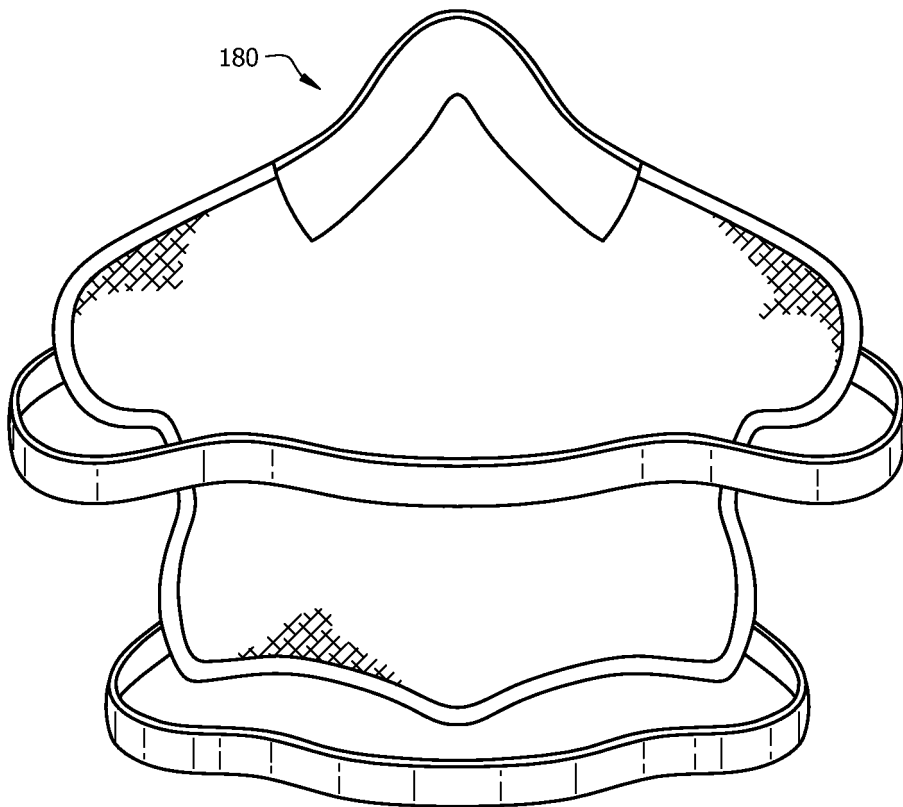
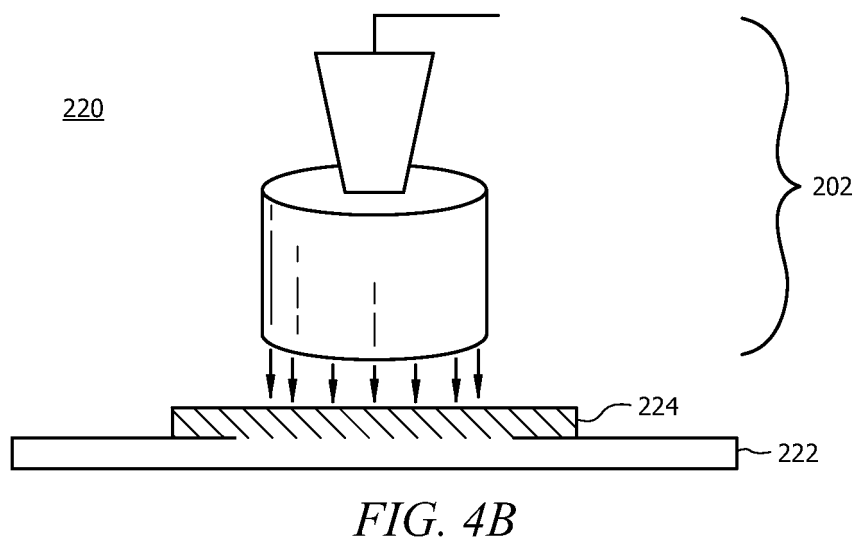
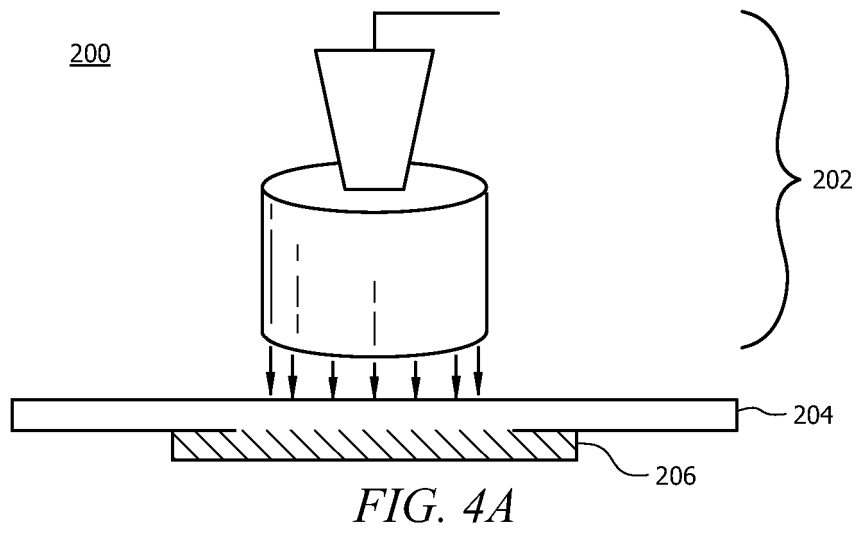


FIG. 3B



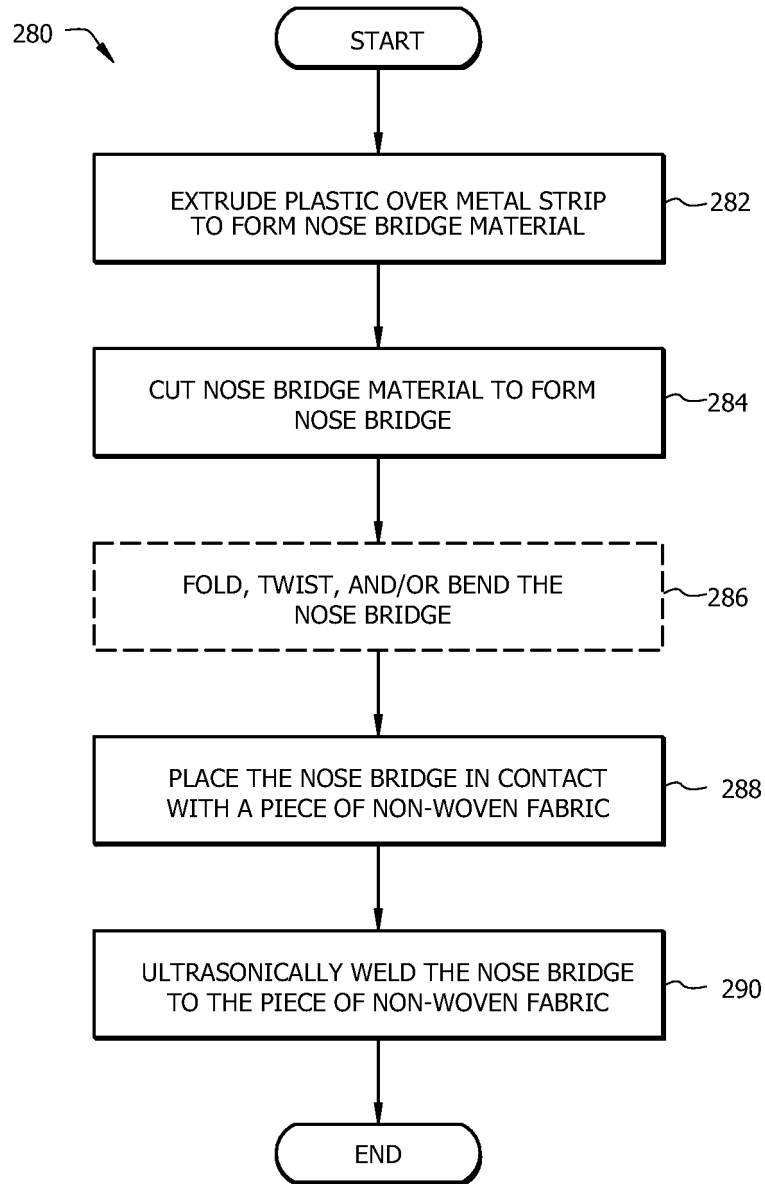


FIG. 5



FIG. 6A

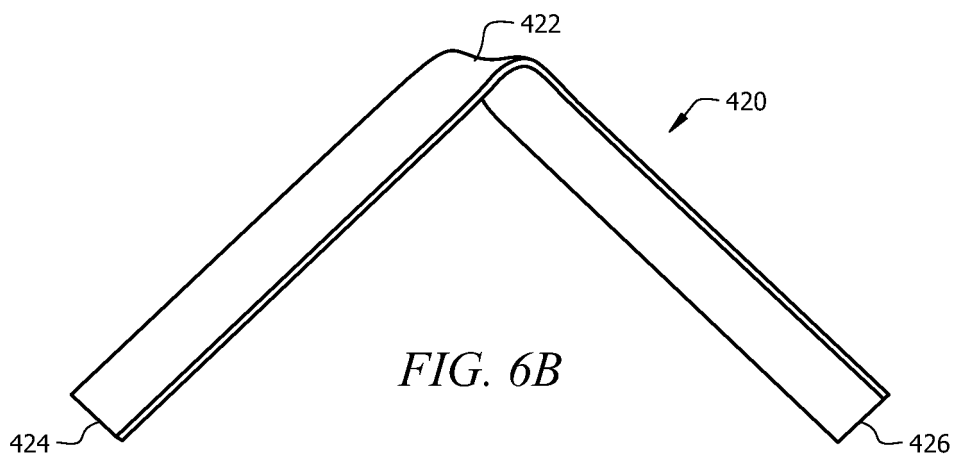


FIG. 6B

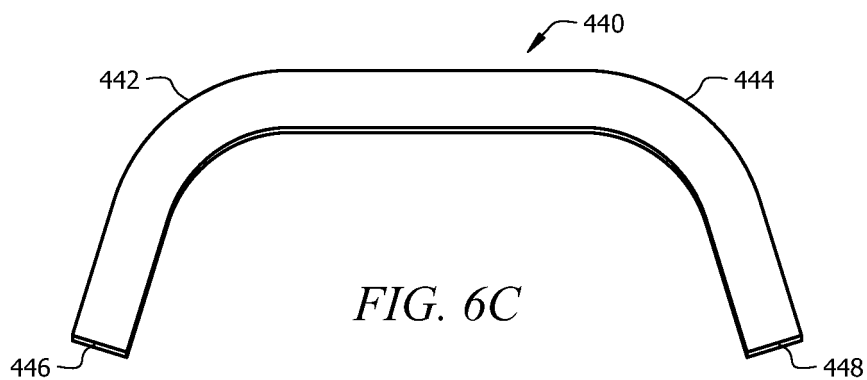


FIG. 6C

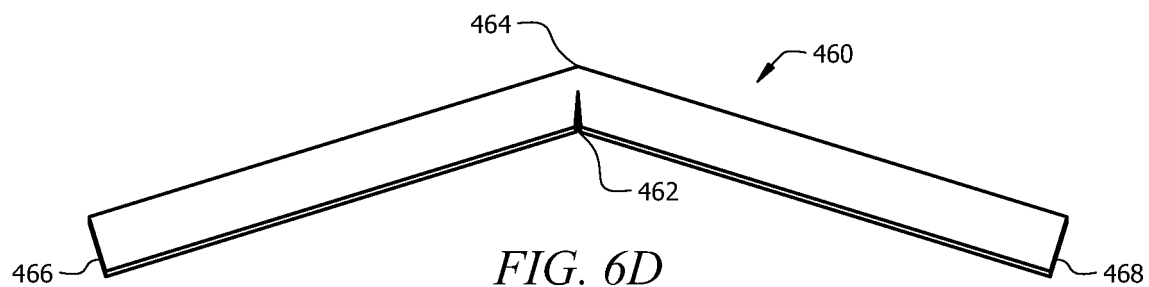


FIG. 6D

REFERENCES CITED IN THE DESCRIPTION

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