US 20250261709A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2025/0261709 A1**

Rome et al. (43) **Pub. Date: Aug. 21, 2025**

(54) **FACE SHIELD WITH ADJUSTABLE TENSIONING**

(71) Applicants: **Patrick Rome**, El Paso (CA); **Elizabeth S. Rome**, El Paso (CA)

(72) Inventors: **Patrick Rome**, El Paso (CA); **Elizabeth S. Rome**, El Paso (CA)

(21) Appl. No.: **19/200,339**

(22) Filed: **May 6, 2025**

Related U.S. Application Data

(63) Continuation-in-part of application No. 17/334,471, filed on May 28, 2021.

(60) Provisional application No. 63/032,898, filed on Jun. 1, 2020, provisional application No. 63/110,278, filed on Nov. 5, 2020, provisional application No. 63/166,921, filed on Mar. 26, 2021.

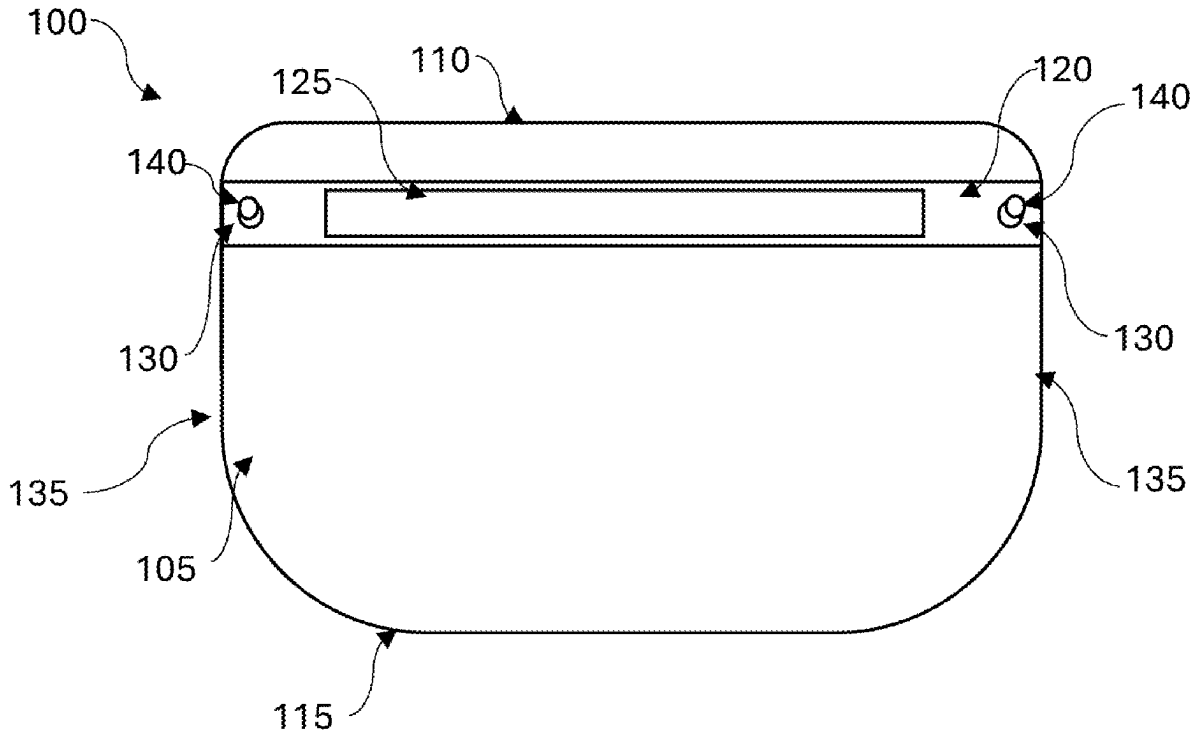
Publication Classification

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

(52) **U.S. Cl.**
CPC ***A41D 13/1184*** (2013.01); ***A41D 13/1161*** (2013.01)

(57) **ABSTRACT**

A face shield system and associated method are disclosed, the face shield system comprising a face shield sheet, at least one shield clip, at least one reinforcement tab affixed to the face shield sheet, a head mount, and a cinch strap inserted through at least one mounting hole in the face shield sheet.



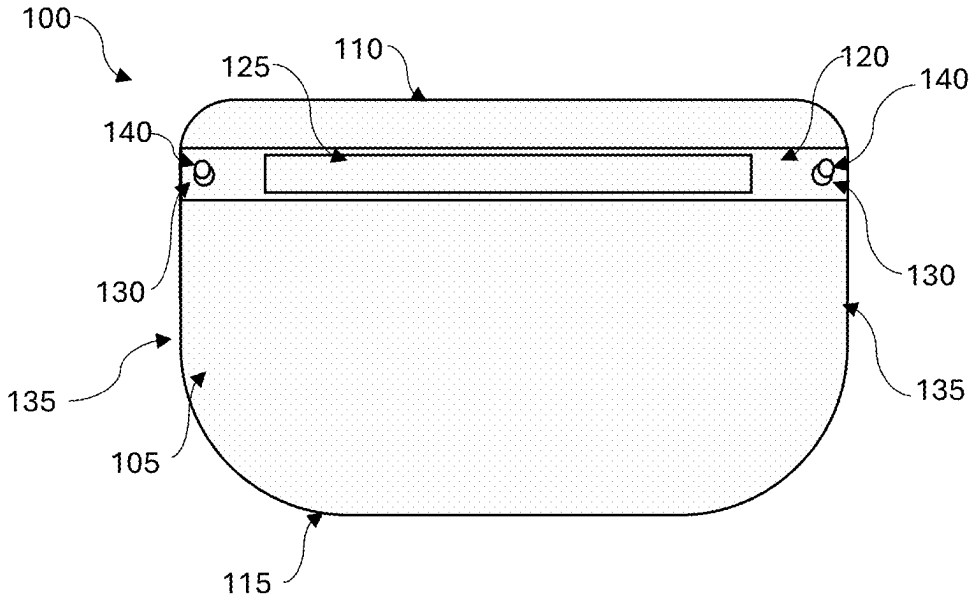

100
125
110
120
140
140
130
130
135
135
105
115

FIG. 1A

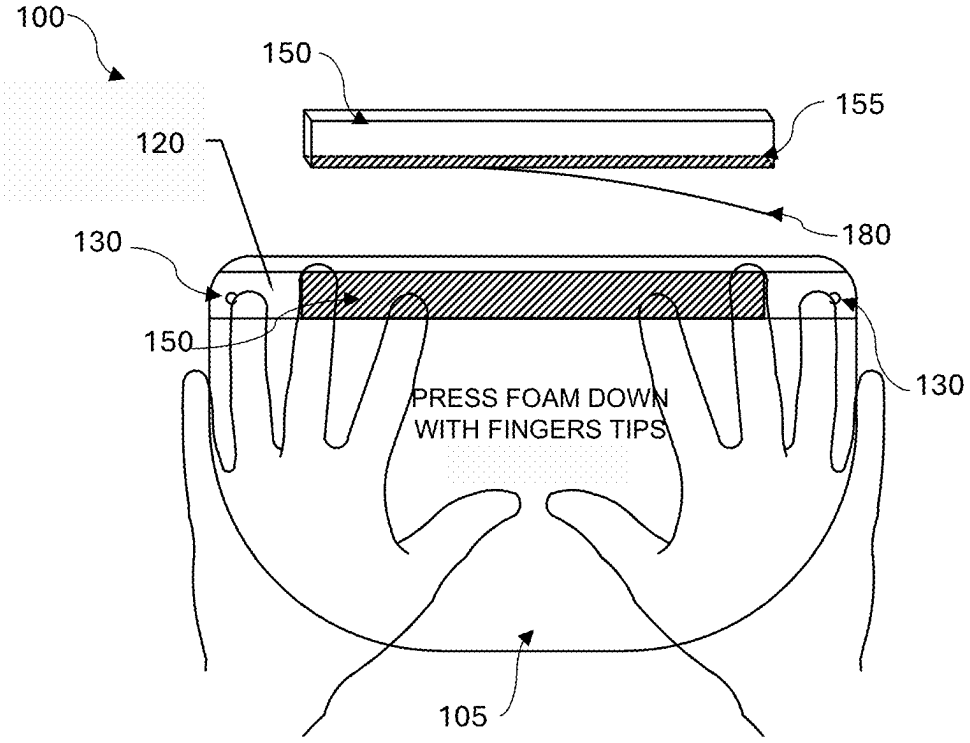

100
150
155
120
180
130
150
130
PRESS FOAM DOWN
WITH FINGERS TIPS
105

FIG. 1B

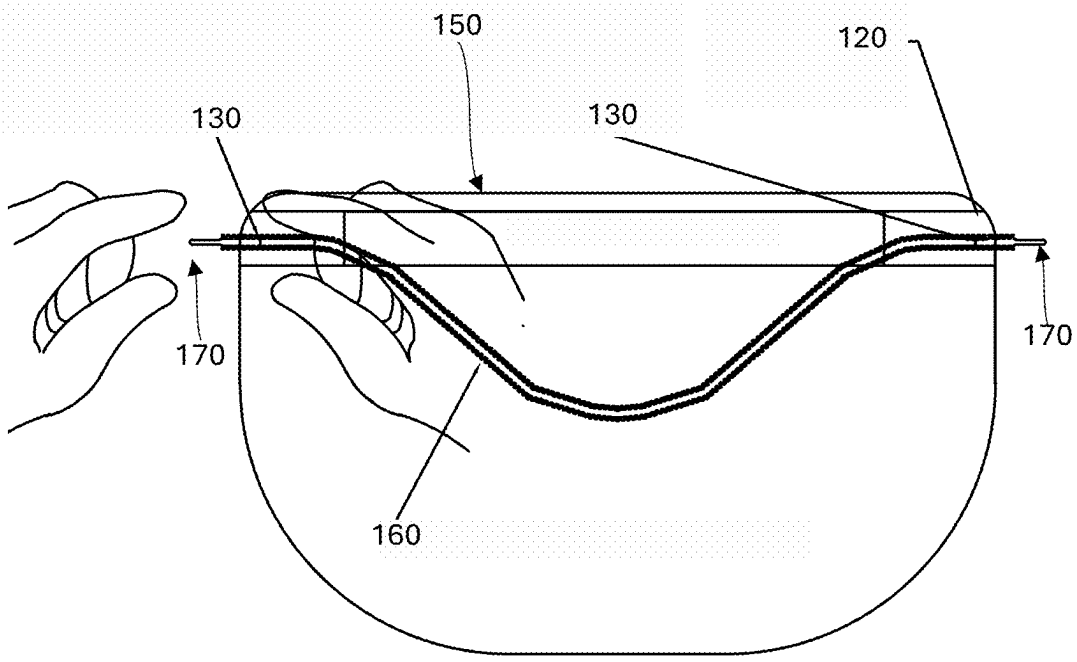


FIG. 1C

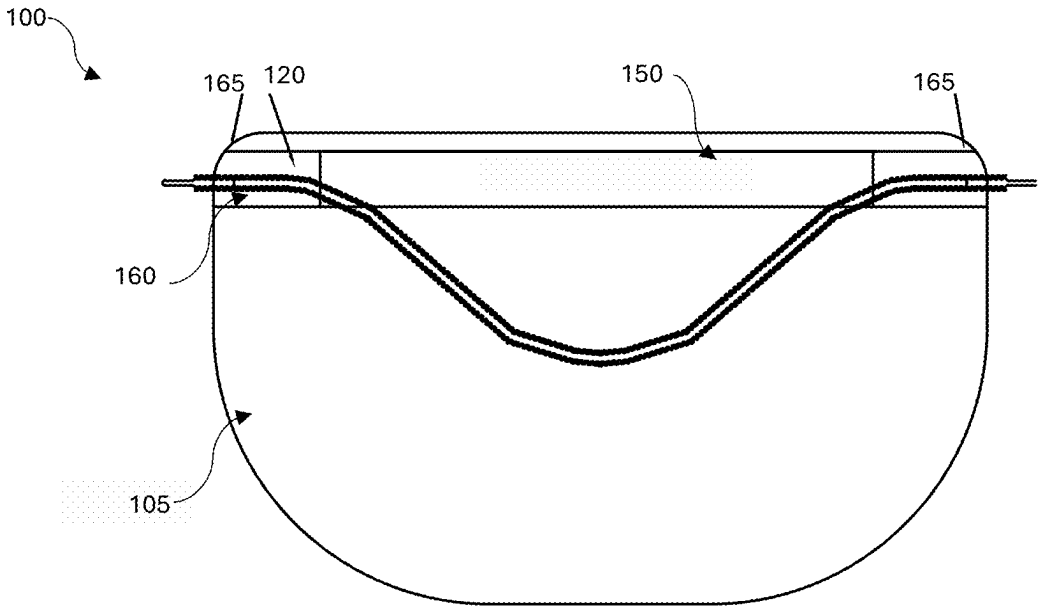


FIG. 1D

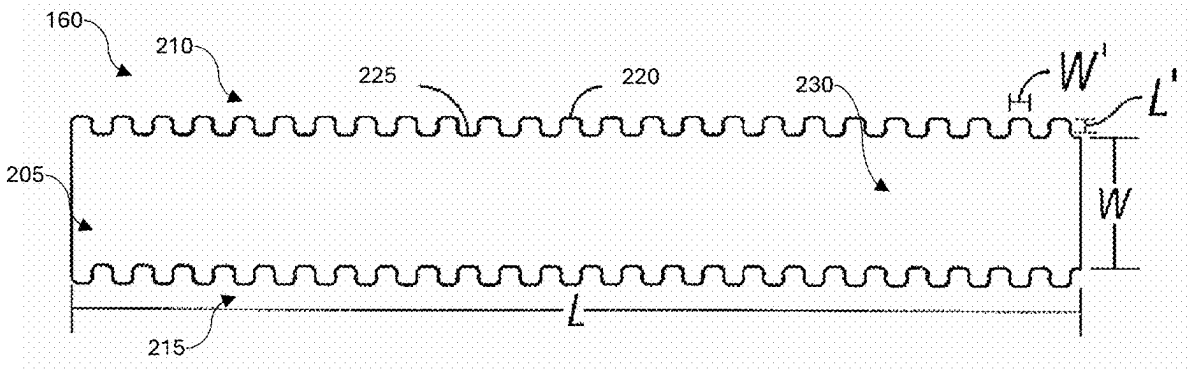


FIG. 2

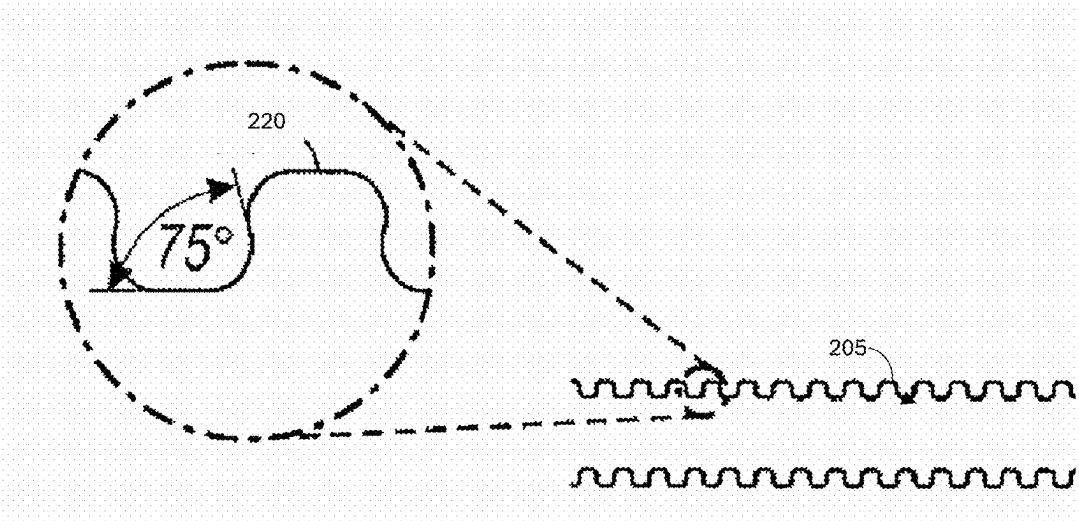


FIG. 3

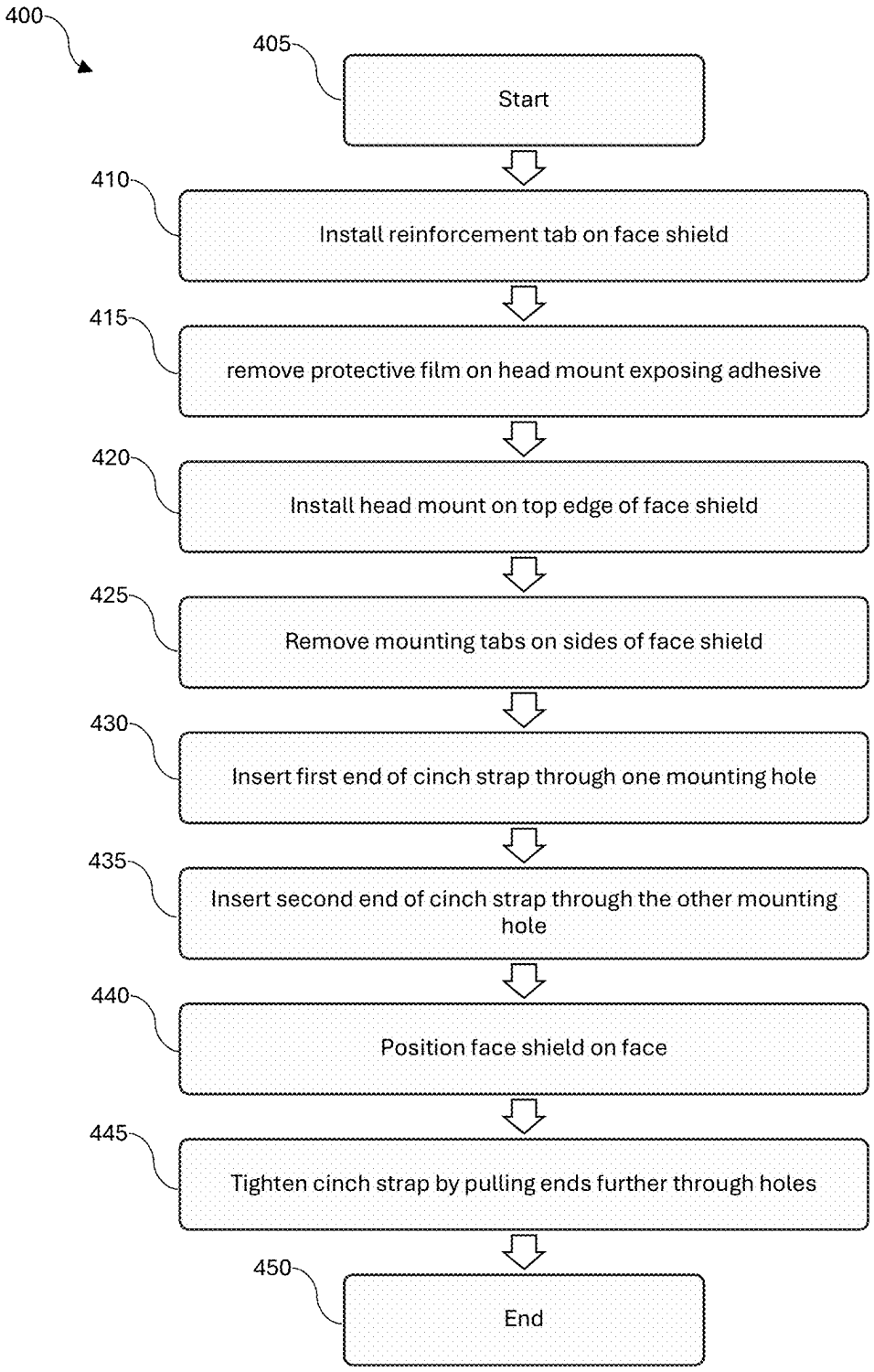

400
405
Start
410
Install reinforcement tab on face shield
415
remove protective film on head mount exposing adhesive
420
Install head mount on top edge of face shield
425
Remove mounting tabs on sides of face shield
430
Insert first end of cinch strap through one mounting hole
435
Insert second end of cinch strap through the other mounting hole
440
Position face shield on face
445
Tighten cinch strap by pulling ends further through holes
450
End

FIG. 4

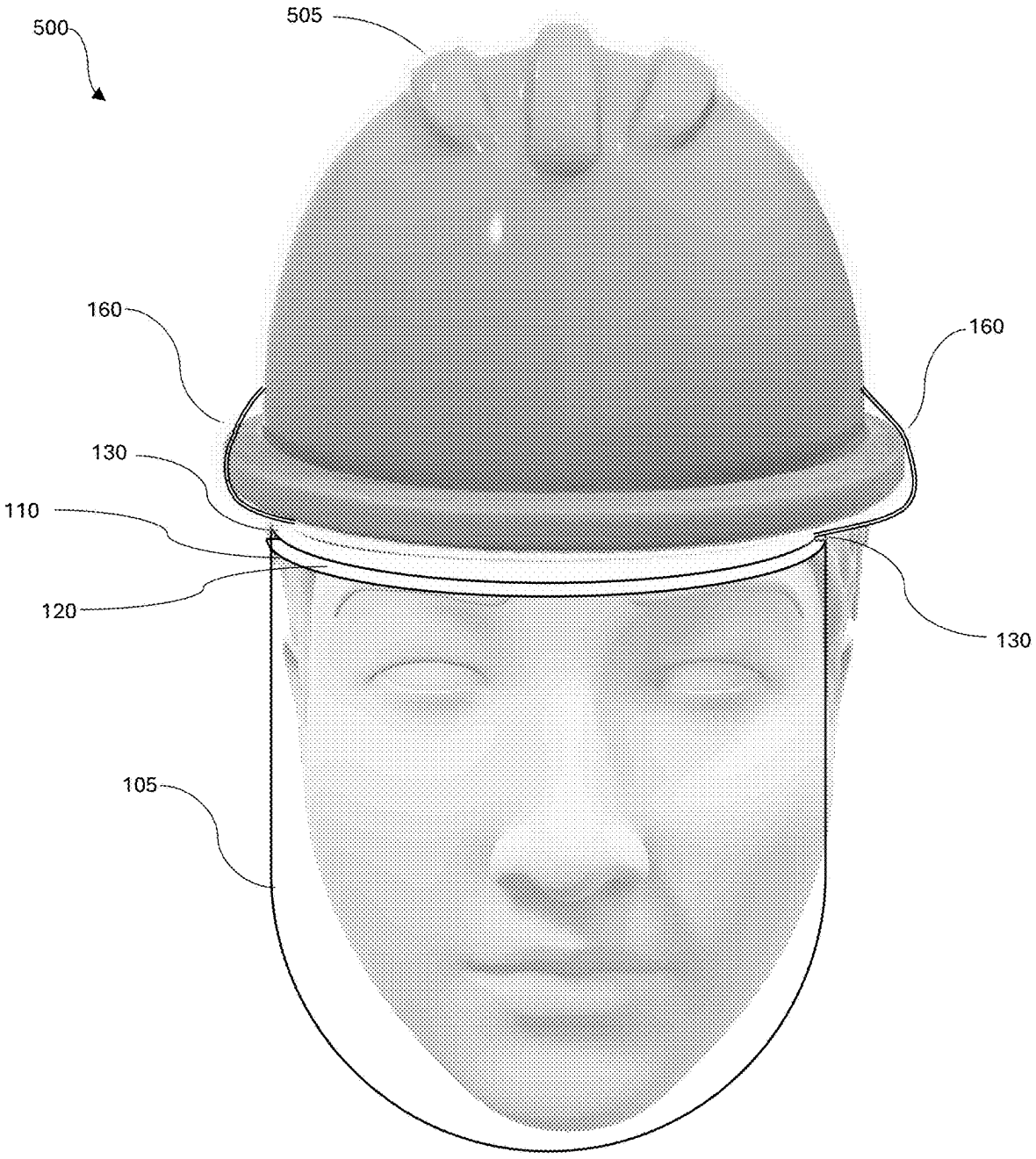


FIG. 5

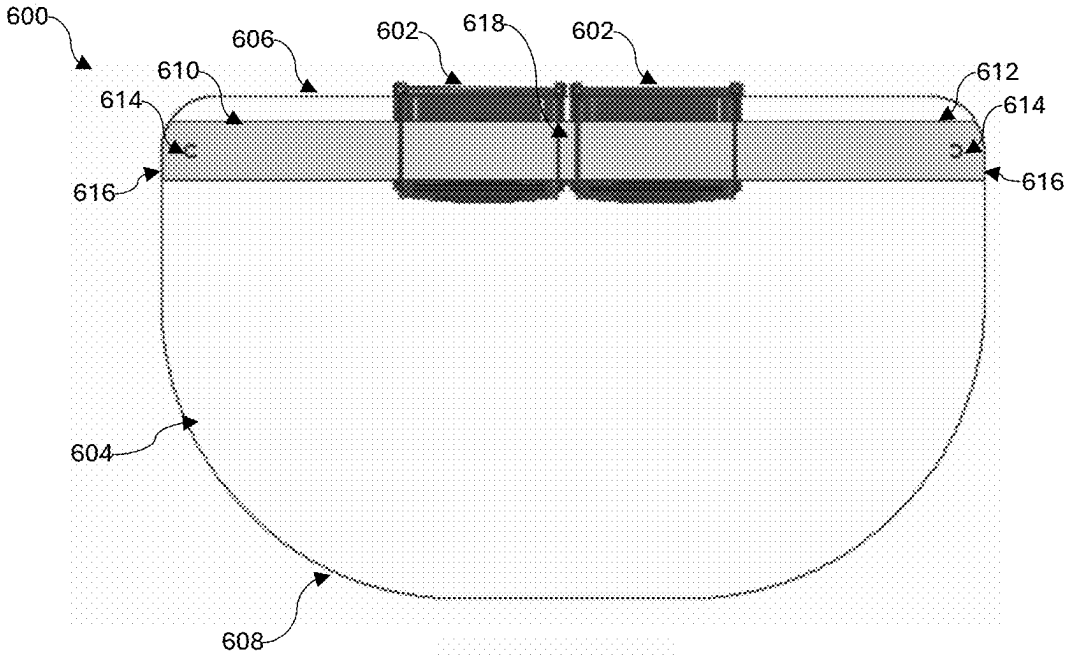

600
606
602
618
602
610
612
614
614
616
616
604
608

FIG. 6A

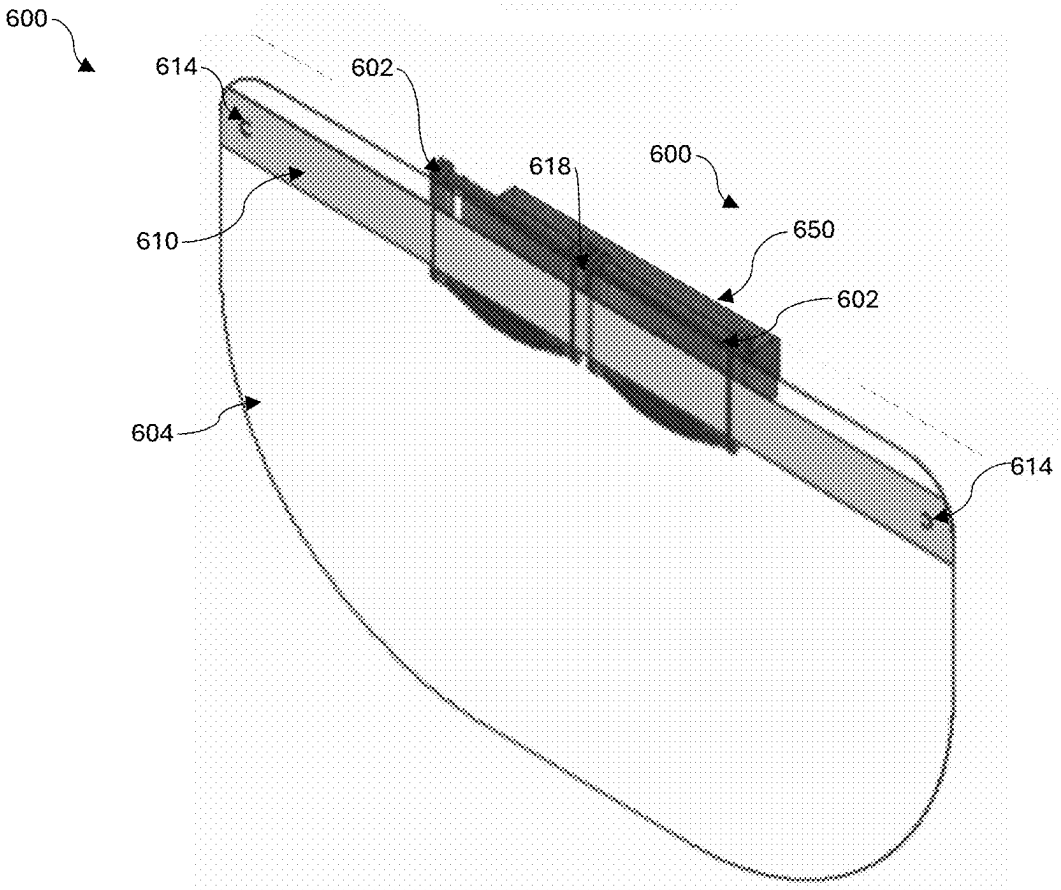

600
614
602
618
600
610
650
602
604
614

FIG. 6B

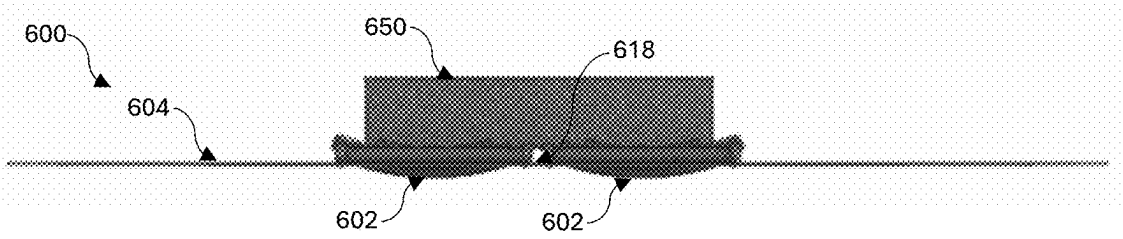

600
650
618
604
602
602

FIG. 6C

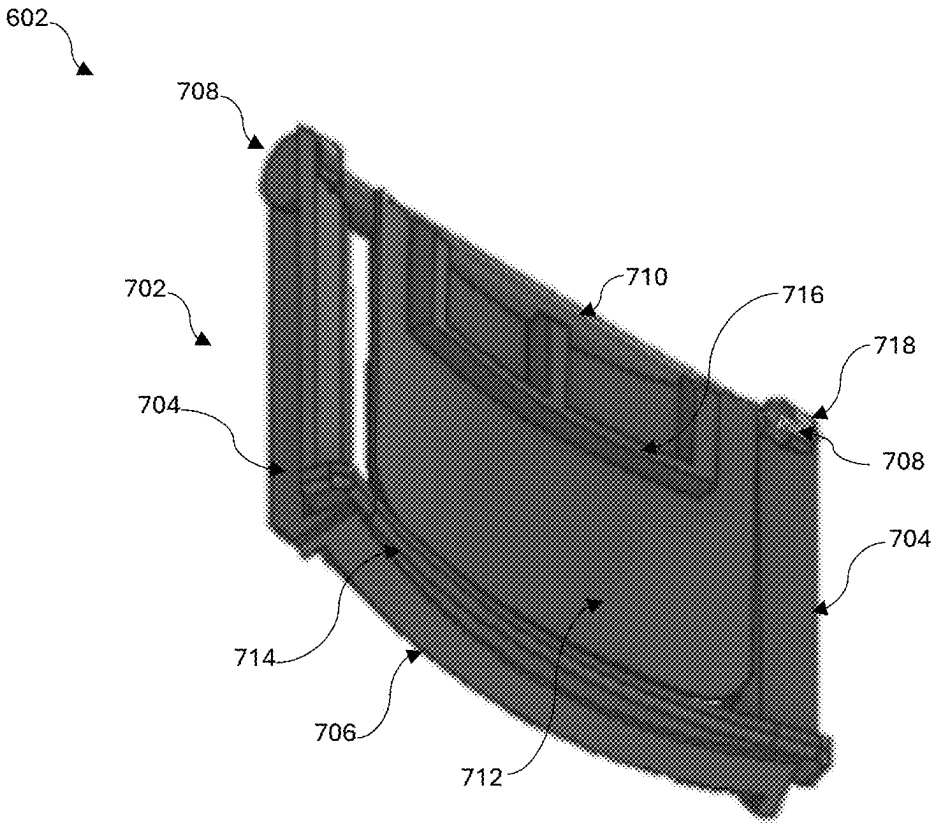

602
708
710
716
702
718
704
708
704
714
706
712

FIG. 7A

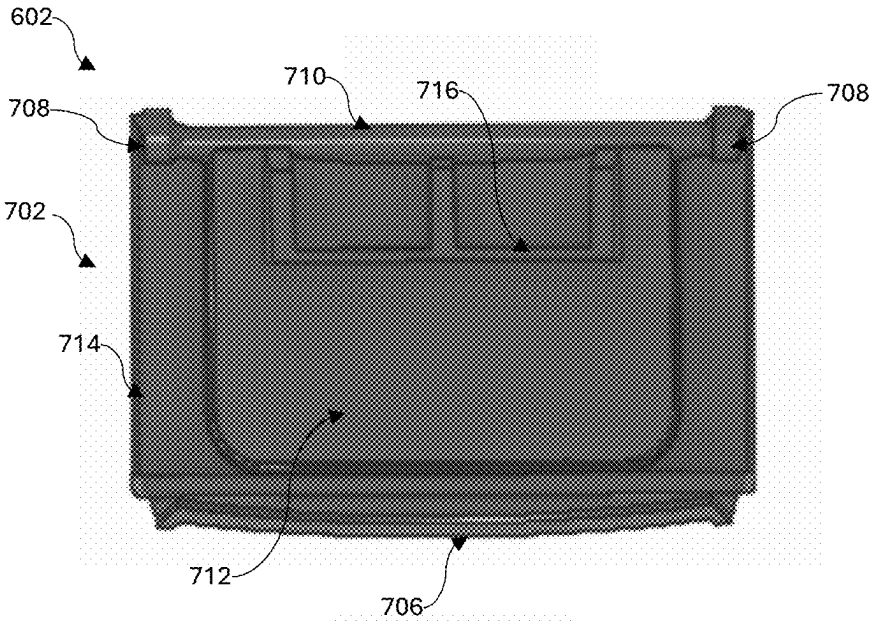

602
710
716
708
708
702
714
712
706

FIG. 7B

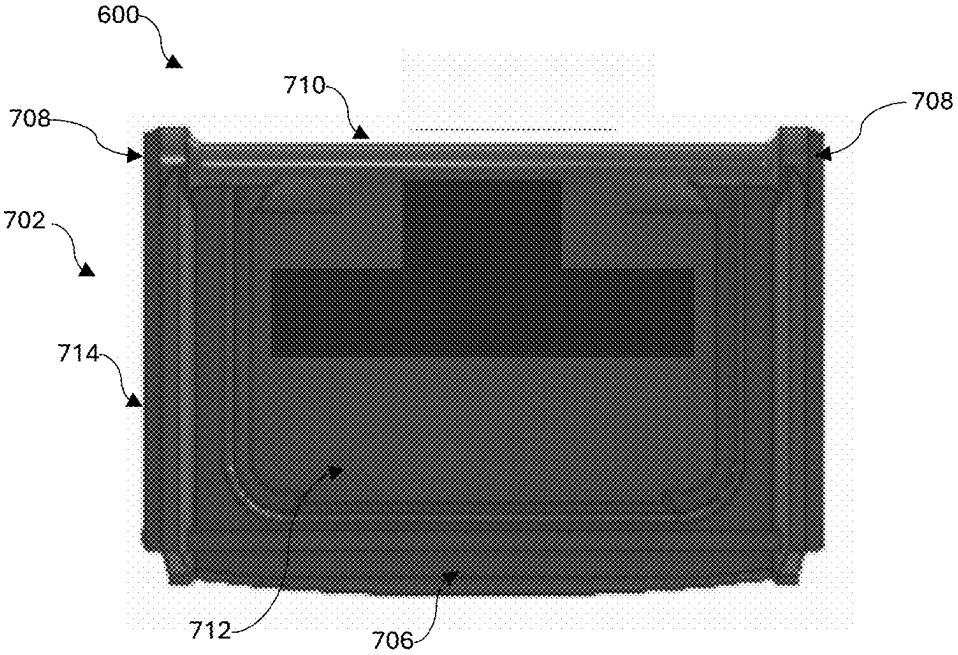

600
710
708
708
702
714
712
706

FIG. 7C

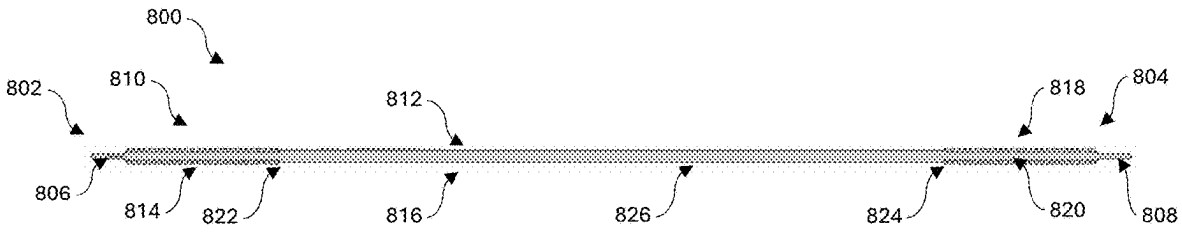


FIG. 8

FACE SHIELD WITH ADJUSTABLE TENSIONING

CROSS REFERENCE TO RELATED PATENT APPLICATIONS

[0001] This application is a Continuation in Part of U.S. application Ser. No. 17/334,471, entitled "FACE SHIELD WITH ADJUSTABLE TENSIONING," filed on May 28, 2021. Application Ser. No. 17/334,471 is incorporated herein by reference in its entirety.

[0002] U.S. application Ser. No. 17/334,471 and this patent application claim the priority and benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application Ser. No. 63/032,898 filed Jun. 1, 2020, entitled "FACE SHIELD WITH ADJUSTABLE TENSIONING." U.S. Provisional Patent Application Ser. No. 63/032,898 is herein incorporated by reference in its entirety.

[0003] U.S. application Ser. No. 17/334,471 and this patent application claim the priority and benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application Ser. No. 63/110,278 filed Nov. 5, 2020, entitled "ZIP STRAP TETHER." U.S. Provisional Patent Application Ser. No. 63/110,278 is herein incorporated by reference in its entirety.

[0004] U.S. application Ser. No. 17/334,471 and this patent application claim the priority and benefit under 35 U.S.C. § 119(e) of U.S. Provisional Patent Application Ser. No. 63/166,921 filed Mar. 26, 2021, entitled "ZIP STRAP TETHER." U.S. Provisional Patent Application Ser. No. 63/166,921 is herein incorporated by reference in its entirety.

TECHNICAL FIELD

[0005] Embodiments are generally related to the field of personal protective equipment. Embodiments are also related to cinch straps. Embodiments are further related to face shields with adjustable straps that allow the tension in the strap to be adjusted.

BACKGROUND

[0006] Recent developments have created an urgent need for personal protective equipment to help prevent the transmission of communicable diseases. One such device is a face shield. Some very expensive shields offer excellent protection and fit. However, their cost makes them impractical for widespread distribution.

[0007] Other, less expensive face shields have a suspect means of holding the shield in place over the user's face. Either the straps are insufficiently weak, or not adjustable, or both. As such, there is a need in the art for advanced face shield systems that are inexpensive, and simple to ship, but still provide excellent fit and adjustability, as disclosed herein.

SUMMARY

[0008] The following summary is provided to facilitate an understanding of some of the innovative features unique to the embodiments disclosed and is not intended to be a full description. A full appreciation of the various aspects of the embodiments can be gained by taking the entire specification, claims, drawings, and abstract as a whole.

[0009] The present embodiments relate to personal protective equipment.

[0010] It is an aspect of the disclosed embodiments to provide face shields.

[0011] It is an aspect of the disclosed embodiments to provide medical face shields and facemasks.

[0012] It is an aspect of the disclosed embodiments to provide straps for face shields.

[0013] It is an aspect of the disclosed embodiments to provide adjustable cinching straps for face shields.

[0014] It is an aspect of the disclosed embodiments to provide adjustable, reusable face shield systems.

[0015] Aspects and other advantages of the disclosed embodiments can now be achieved as further disclosed herein. In an embodiment, a face shield comprises a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, a head mount, and a cinch strap inserted through at least one mounting hole in the face shield sheet. In an embodiment, the at least one mounting hole comprises two mounting holes formed on the face shield sheet. In an embodiment, the face shield system further comprises a chad configured in each of the at least one mounting hole. In an embodiment, the face shield system further comprises an adhesive disposed on the reinforcement tab. In an embodiment, the face shield system further comprises at least one hold point on the face shield sheet. In an embodiment, the head mount further comprises a cuboid cushion and an adhesive disposed on one side of the cuboid cushion. In an embodiment, the face shield system further comprises a protective cover overlaying the adhesive disposed on one side of the cuboid cushion. In an embodiment, the cinch strap further comprises a planar, flat strap. In an embodiment, the cinch strap further comprises a plurality of teeth formed on a first edge of the cinch strap and a plurality of teeth formed on a second edge of the cinch strap. In an embodiment, the cinch strap further comprises smooth distal ends. In an embodiment, the at least one reinforcement tab comprises a plurality of reinforcement tabs configured to be disposed one on top of the other on the face shield sheet. In an embodiment, the at least one reinforcement tab is further configured to be concave.

[0016] In another embodiment, a face shield system comprises a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, a head mount, two mounting holes configured on the face shield sheet, at least one hold point on the face shield sheet, and a cinch strap inserted through at least one mounting hole in the face shield sheet. In an embodiment, the head mount further comprises a cuboid cushion, an adhesive disposed on one side of the cuboid cushion and a protective cover overlaying the adhesive disposed on one side of the cuboid cushion. In an embodiment, the cinch strap further comprises a planar, flat strap, a plurality of teeth formed on a first edge of the cinch strap, and a plurality of teeth formed on a second edge of the cinch strap.

[0017] In another embodiment, a face shield comprises a head covering, a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, a head mount, and a cinch strap inserted through at least one mounting hole in the face shield sheet and configured to be bound around the head covering. In an embodiment, the head covering comprises a helmet. In an embodiment, the cinch strap comprises two cinch straps, the two cinch straps being configured to attach to the face shield sheet and to be bound together at their respective tag ends. In an embodiment, the two cinch straps each further comprise a planar, flat strap, a plurality of teeth

formed on a first edge of the cinch strap, and a plurality of teeth formed on a second edge of the cinch strap. In an embodiment, the head mount further comprises a cuboid cushion and an adhesive disposed on one side of the cuboid cushion.

[0018] In an embodiment, a face shield comprises a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, at least one shield clip configured to connect to the face shield sheet, a head mount configured to be attached to the at least one shield clip, and a cinch strap inserted through at least one mounting hole in the face shield sheet. In an embodiment, the at least one mounting hole comprises two mounting holes formed on the face shield sheet. In an embodiment, the at least one shield clip comprises two shield clips. In an embodiment, the two shield clips are adjacent to one another. In an embodiment, the two shield clips are attached to the face shield sheet over the at least one reinforcement tab. In an embodiment, the face shield further comprises an adhesive disposed on the at least one reinforcement tab. In an embodiment, the head mount further comprises a cuboid cushion and an adhesive disposed on one side of the cuboid cushion. In an embodiment, the cinch strap further comprises: a planar, flat strap. In an embodiment, the cinch strap further comprises a plurality of teeth formed on a first edge of the cinch strap and a second plurality of teeth formed on a second edge of the cinch strap. In an embodiment, the cinch strap further comprises smooth distal ends. In an embodiment, the at least one reinforcement tab comprises a plurality of reinforcement tabs configured to be disposed one on top of the other on the face shield sheet. In an embodiment, the at least one reinforcement tab is further configured to be concave. In an embodiment, the at least one shield clip comprises an outer rim comprising a U-shaped frame with two clip arms attached to a clip base and a clip flap. In an embodiment, he face shield further comprises a clip dowel connected to the clip flap and a keeper connected to each end of the clip dowel.

[0019] In an embodiment, a face shield system comprises a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, at least one shield clip configured to connect to the face shield sheet, a head mount configured to attach to the at least one shield clip, two mounting holes configured on the face shield sheet, and a cinch strap inserted through at least one mounting hole in the face shield sheet. In an embodiment, the head mount further comprises a cuboid cushion, an adhesive disposed on one side of the cuboid cushion, and a protective cover overlaying the adhesive disposed on one side of the cuboid cushion. In an embodiment, the cinch strap further comprises a planar, flat strap, a plurality of teeth formed on a first edge of the cinch strap, and a plurality of teeth formed on a second edge of the cinch strap.

[0020] In an embodiment, a face shield comprises a face shield sheet, at least one shield clip configured to connect to the face shield sheet, a head mount configured to attach to the at least one shield clip, and a cinch strap inserted through at least one mounting hole in the face shield sheet and configured to be bound around the head covering. In an embodiment, the at least on shield clip comprises an outer rim comprising a U-shaped frame with two clip arms attached to a clip base and a clip flap. In an embodiment, the face shield further comprises a clip dowel connected to the clip flap and a keeper connected to each end of the clip dowel.

BRIEF DESCRIPTION OF THE FIGURES

[0021] The accompanying figures, in which like reference numerals refer to identical or functionally similar elements throughout the separate views and which are incorporated in and form a part of the specification, further illustrate the embodiments and, together with the detailed description, serve to explain the embodiments disclosed herein.

[0022] FIG. **1**A depicts a face shield system, in accordance with the disclosed embodiments;

[0023] FIG. **1**B depicts a face shield system, in accordance with the disclosed embodiments;

[0024] FIG. **1**C depicts a face shield system with a cinch strap, in accordance with the disclosed embodiments;

[0025] FIG. **1**D depicts a face shield system with a cinch strap, in accordance with the disclosed embodiments;

[0026] FIG. **2** depicts a section of cinch strap, in accordance with the disclosed embodiments;

[0027] FIG. **3** depicts an exploded view of a cinch strap, in accordance with the disclosed embodiments;

[0028] FIG. **4** depicts steps associated with a method for engaging a face shield, in accordance with the disclosed embodiments;

[0029] FIG. **5** depicts a face shield system, in accordance with the disclosed embodiments;

[0030] FIG. **6**A depicts an elevation view of another face shield system, in accordance with the disclosed embodiments;

[0031] FIG. **6**B depicts a perspective view of the face shield system, in accordance with the disclosed embodiments;

[0032] FIG. **6**C depicts top view of the face shield system with a head mount, in accordance with the disclosed embodiments;

[0033] FIG. **7**A depicts a perspective view of a shield clip associated with the face shield system, in accordance with the disclosed embodiments;

[0034] FIG. **7**B depicts a rear elevation view of a shield clip associated with the face shield system, in accordance with the disclosed embodiments;

[0035] FIG. **7**C depicts a front elevation view of a shield clip associated with the face shield system, in accordance with the disclosed embodiments; and

[0036] FIG. **8** depicts aspects of a cinch strap associated with the face shield system, in accordance with the disclosed embodiments.

DETAILED DESCRIPTION

[0037] The particular values and configurations discussed in the following non-limiting examples can be varied, and are cited merely to illustrate one or more embodiments, and are not intended to limit the scope thereof.

[0038] Example embodiments will now be described more fully hereinafter, with reference to the accompanying drawings, in which illustrative embodiments are shown. The embodiments disclosed herein can be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the embodiments to those skilled in the art. Like numbers refer to like elements throughout.

[0039] The terminology used herein is for the purpose of describing particular embodiments only and is not intended

to be limiting. As used herein, the singular forms "a", "an", and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0040] Throughout the specification and claims, terms may have nuanced meanings suggested or implied in context beyond an explicitly stated meaning. Likewise, the phrase "in one embodiment" as used herein does not necessarily refer to the same embodiment and the phrase "in another embodiment" as used herein does not necessarily refer to a different embodiment. It is intended, for example, that claimed subject matter include combinations of example embodiments in whole or in part.

[0041] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0042] It is contemplated that any embodiment discussed in this specification can be implemented with respect to any method, kit, reagent, or composition of the invention, and vice versa. Furthermore, compositions of the invention can be used to achieve methods of the invention.

[0043] It will be understood that particular embodiments described herein are shown by way of illustration and not as limitations of the invention. The principal features of this invention can be employed in various embodiments without departing from the scope of the invention. Those skilled in the art will recognize, or be able to ascertain using no more than routine experimentation, numerous equivalents to the specific procedures described herein. Such equivalents are considered to be within the scope of this invention and are covered by the claims.

[0044] The use of the word "a" or "an" when used in conjunction with the term "comprising" in the claims and/or the specification may mean "one," but it is also consistent with the meaning of "one or more," "at least one," and "one or more than one." The use of the term "or" in the claims is used to mean "and/or" unless explicitly indicated to refer to alternatives only or the alternatives are mutually exclusive, although the disclosure supports a definition that refers to only alternatives and "and/or." Throughout this application, the term "about" is used to indicate that a value includes the inherent variation of error for the device, the method being employed to determine the value, or the variation that exists among the study subjects.

[0045] As used in this specification and claim(s), the words "comprising" (and any form of comprising, such as "comprise" and "comprises"), "having" (and any form of having, such as "have" and "has"), "including" (and any form of including, such as "includes" and "include") or "containing" (and any form of containing, such as "contains" and "contain") are inclusive or open-ended and do not exclude additional, unrecited elements or method steps.

[0046] The term "or combinations thereof" as used herein refers to all permutations and combinations of the listed items preceding the term. For example, "A, B, C, or combinations thereof" is intended to include at least one of: A, B, C, AB, AC, BC, or ABC, and if order is important in a particular context, also BA, CA, CB, CBA, BCA, ACB, BAC, or CAB. Continuing with this example, expressly included are combinations that contain repeats of one or more item or term, such as BB, AAA, AB, BBC, AAABCCCC, CBBAAA, CABABB, and so forth. The skilled artisan will understand that typically there is no limit on the number of items or terms in any combination, unless otherwise apparent from the context.

[0047] All of the compositions and/or methods disclosed and claimed herein can be made and executed without undue experimentation in light of the present disclosure. While the compositions and methods of this invention have been described in terms of preferred embodiments, it will be apparent to those of skill in the art that variations may be applied to the compositions and/or methods and in the steps or in the sequence of steps of the method described herein without departing from the concept, spirit and scope of the invention. All such similar substitutes and modifications apparent to those skilled in the art are deemed to be within the spirit, scope and concept of the invention as defined by the appended claims.

[0048] U.S. Pat. No. 8,176,599, titled "CINCHING AND BUNDLING TIE" filed Mar. 1, 2010, describes a cinching and bundling tie. U.S. Pat. No. 8,176,599 is herein incorporated by reference in its entirety.

[0049] FIG. **1**A illustrates a face shield system **100** with adjustable tensioning straps in accordance with the embodiments disclosed herein. The face shield system **100** can generally comprise a face shield sheet **105**. The face shield sheet **105** can comprise a generally transparent material. The top edge **110** of the shield sheet **105** can have a substantially straight top edge. The lower perimeter **115** of the face shield sheet **105** can be curved, concave, and/or U-shaped. The face shield sheet **105** can be selected to be sufficiently wide and flexible to partially wrap around a human head. The face shield sheet **105** should be selected to be a material that is flexible, such as plastic. It is preferable for the face shield sheet **105** to be relatively thin to reduce cost and weight of the system **100**. In certain embodiments, the thickness of the face shield sheet **105** can be selected to meet safety standards for a given application.

[0050] A reinforcement tab **120** can be installed or otherwise configured along a top portion **110** of the face shield sheet **105**. In certain embodiments, multiple reinforcement tabs **120** can be overlaid or distributed on the face shield sheet **105** to improve the structural integrity of the system **100**. The reinforcement tab(s) **120**, can be transparent. The reinforcement tab **120** can be configured of a stiff rubber or plastic material.

[0051] In certain embodiments, the reinforcement tab **120** can be integrated in the face shield sheet **105**, and can comprise a generally thickened section of material. In other embodiments, the reinforcement tab **120** can comprise an independent stiffened strip, such as a plastic strip, with adhesive **125** on one side. In such embodiments, the reinforcement tab **120** can be adhered to the upper area of the face shield sheet **105**. The reinforcement tab **120** can be installed on the inner facing surface or the outer facing

surface of the face shield sheet **105**, and can, in some embodiments, extend across the length of the face shield sheet **105**.

[0052] The reinforcement tab **120** or band stiffens and thickens the face shield sheet **105** at the forehead mounting point, which has multiple benefits. The reinforcement tab **120** keeps the entire face shield sheet **105** more stable on the forehead, decreasing deflection of the shield system **100**. The reinforcement tab **120** can also stiffen the mounting holes **130** to allow for reusability of the shield and to avoid tearing of the face shield sheet **105**. In certain embodiments, holes can be formed in the reinforcement tab **120** at locations that align with the mounting holes **130** on the face shield sheet **105**. The reinforcement tab **120** allows for the use of thinner films for the face shield sheet while maintaining the face shield integrity.

[0053] The reinforcement tab **120** can generally be formed of a stiff but pliable material (such a plastic) and can extend from one of the lateral sides **135** of the face shield sheet **105** to the other. In certain embodiments, the reinforcement tab **120** can be biased with a curvature so as to be concave and match the contour of a human head.

[0054] Mounting holes **130** can be formed in the face shield sheet **105** and/or the reinforcement tab **120**. The mounting holes **130** can include hole chads **140**, that can be removed to reveal the mounting holes **130**. The hole chads **140** can be "punched" into the face shield and/or reinforcement tab.

[0055] As illustrated in FIG. **1**B, the face shield system **100** can further include a head mount **150**. The head mount **150** can comprise a cube or cuboid, formed of a generally soft or malleable material such as foam or rubber. A projection of the head mount **150** shape can generally match the 2 dimensional profile of the reinforcement tab **120** but can be configured to be slightly shorter than the distance between the respective strap mounting holes **130**, so that the head mount **150** does not cover the strap mounting holes **130**. One surface of the head mount **150** can be coated with an adhesive **155**. The adhesive **155** can be covered again, by a cover **180** (e.g. a removable paper cover). The head mount **150** can be installed on the inner surface of the face shield sheet **105**, for example, along the two dimensional outline of the reinforcement tab **120**, by removing the paper cover **180** over the adhesive **155** and adhering the head mount **150** in place. The outward extending shape of the head mount **150** allows the face shield system **100** to be comfortably worn in front of a human's face and can generally be fitted along the forehead region of the wearer. The shape also holds the top edge of the face shield sheet **105** away from the user.

[0056] The adhesive **155** on the head mount **150** can be configured so that the head mount **150** can be removed and reinstalled on the face shield sheet **105**. The removal of the head mount **150** allows the components of the system **100** to be cleaned and sterilized individually before being reassembled for use.

[0057] The face shield system **100** further comprises a cinch strap **160**, as illustrated in FIG. **1**C and FIG. **1**D. The cinch strap **160** can comprise a head band used to hold the face shield system **100** in place. To that end, the cinch strap **160** can be configured to fit around a user's head, and interface with the face shield sheet **105** at its two edges. In certain embodiments, multiple cinch straps **160** can be used to engage with multiple sets of mounting holes **130** on the face shield sheet **105** to hold the face shield sheet **105** in place.

[0058] A section of the cinch strap **160** is illustrated in FIG. **2**. The cinch strap **160** can comprise a planar, flat strap **205** having a length (l) and generally uniform width (w) made from any pliable semi-rigid material, such as polyethylene or polypropylene. The strap **205** also includes a first edge **210** and a second edge **215**. The thickness of the strap **205** will vary depending on the material used for manufacture, though a thickness of less than some fraction of the width of the strap. Along most or the entire length of the two opposing edges **210** and **215** of the strap **205** are teeth **220** in a repeating and uniform pattern having a width (w') and a length (l'). The teeth **220** are generally formed during creation of the strap **205** and therefore, are continuous with the strap **205**. In one embodiment, the teeth **220** are separated troughs **225** being inverse in shape to the teeth **220**. An alternate embodiment the cinch strap is smooth and lacks teeth at the distal ends **170** of the strap **205** in order to allow a more ergonomic and comfortable handle.

[0059] The teeth **220** in the cinch strap **160** are specifically designed to engage in the mounting holes **130**. In particular, the teeth **220** on either side of the strap **205** are configured to pass through the mounting hole **130** but not easily pull back out. The mounting holes **130** can thus be generally circular in design with a widest diameter that is wider than the body **230** of the cinch strap **205** but narrower than the width of the cinch strap **160** measured between opposing teeth **220**. As such, the cinch strap **160** can be locked into place by grabbing the face shield sheet **105** at hold points **165** at the top of the face shield sheet **105**, inserting the cinch strap **160** through the mounting hole **130**, and then pulling the cinch strap **160** through the hole. In certain embodiments, the strap **205** can be used to pull the face shield **100** tight into place on a user's head.

[0060] The cinch strap **160** geometry is such that it can be threaded into the mounting holes **130** on the face shield sheet **105**. The cinch strap **160** allows the system **100** to be fully adjustable with tightening by pulling on the cinch strap **160** while holding the shield edge hold points **165** and pulling on cinch strap **160**. The cinch strap is loosened by slightly bending the edge of the shield to disengage the teeth on the cinch strap from the mounting hole edges.

[0061] FIG. **3** also shows an enlargement of a single tooth **220** and an angle of taper from the top of the tooth **220** to the strap **205** of 75 degrees which results in the most secure locking of teeth 14 when the tie 10 is engaged. The degree of taper can range from 70 degrees to 85 degrees. It has been determined that the tightest and most secure lock can be achieved if the width (w') of a tooth **220**, at its widest point, is one fourth the width (w) of the strap **205**, It has further been found that a tooth length (l') of one half the width (w) of the strap body **230** achieves the most secure cinch. These attributes create a cinch strap **160** that allows the strap to hold firmly through the mounting hole **1130** in one configuration and easily release from the mounting hole **130** as necessary when the length of the cinch strap **160** needs to be adjusted so the face shield system **100** can be removed.

[0062] FIG. **4** illustrates a method **400** for securing a face shield system **100** in accordance with the disclosed embodiments. The method **400** begins at **405**. The first step **410** is to install a reinforcement tab along the top edge of the face shield. The reinforcement tab is critically important as the

face shield sheet may be insufficiently stiff without the reinforcement tab. In certain, embodiments, the reinforcement tab may be pre-installed on the face shield sheet or integrated in the face shield sheet.

[0063] Next, at step **415** the protective film on the head mount can be removed to expose the underlying adhesive on the outer surface of the head mount. The head mount can then be installed on the face shield, at step **420** by joining the head mount to an upper portion of the face shield sheet (approximately aligned with the reinforcement tab). This is accomplished by pressing the adhesive covered side of the head mount onto the face shield sheet.

[0064] Next, at step **425**, the hole chads can be removed to expose the mounting holes on the edges of the face shield sheet and/or reinforcement tab. In certain embodiments, this can be accomplished by using a poking device, like a pencil or other such device to poke the hole chads out.

[0065] With the hole chads open, the ends of the cinching straps can be inserted into the mounting holes on the two sides of the face shield as shown at step **430** and step **435**. In certain embodiments, the cinch straps ends can be inserted such that the perimeter of the strap and face shield is larger than the circumference of the user's head. This allows the assembly to be brought into position, as shown at step **440**, with the head mount roughly resting on the user's forehead. At this point, the cinch strap ends can be pulled further through the mounting holes to create a snug fit around the user's head as shown at step **445**, and the method ends at **450**.

[0066] In other embodiments, a face shield system **100** can be configured to interface with a helmet as illustrated in FIG. **5**. It should be appreciated that many of the aspects of the embodiment illustrated in FIG. **5** are also illustrated in FIGS. **1-3**. In certain embodiments, the cinch straps **160** can be inserted from the outward facing side of the face shield sheet **105**, inward. The cinch strap **160** can be secured to a helmet **505**. The cinch strap **160** can then be tightened to hold the face shield sheet **105** in place below the helmet **505** as illustrated in FIG. **5**.

[0067] In still other embodiments the face shield system can include the use of two cinch straps **160**. The first cinch strap **160** can be inserted through one of the mounting holes **130** and the other cinch strap **160** can be inserted through the other mounting hole **130**. The cinch straps **160** can then be tied together forming a loop with an overhand knot, or other such knot. The cinch strap ends can be pulled to tighten the assembly in place on a user. This embodiment is useful in situations where the user is wearing a head cover, as in FIG. **5**, and a single strap is insufficient to fit around the head covering. The use of two cinch straps is therefore particularly useful for users who may need a face covering while wearing a helmet **505** or other such head covering.

[0068] FIG. **6**A-**6**C Illustrate an embodiment of a face shield system **600** with shield clips **602**. It should be appreciated that many of the aspects of the embodiment illustrated in FIGS. **6**A-**6**C are also illustrated in FIGS. **1-3**.

[0069] FIG. **6**A illustrates an elevation view of a face shield system **600** with adjustable tensioning straps in accordance with the embodiments disclosed herein. The face shield system **600** can generally comprise a face shield sheet **604**. The face shield sheet **604** can comprise a generally transparent material. For example, in certain embodiments, the face shield sheet **604** can comprise a 4 mil plastic anti-fog material, or a 4 mil plastic with an anti-fog coating applied thereto.

[0070] The top edge **606** of the shield sheet **604** can have a substantially straight top edge. The lower perimeter **608** of the face shield sheet **604** can be curved, concave, and/or U-shaped. The face shield sheet **604** can be selected to be sufficiently wide and flexible to partially wrap around a human head. The face shield sheet **604** can be selected to be a material that is flexible, such as plastic.

[0071] A reinforcement tab **610** can be installed or otherwise configured along a top portion **606** of the face shield sheet **604**. In certain embodiments, multiple reinforcement tabs **610** can be overlaid or distributed on the face shield sheet **604** to improve the structural integrity of the system **600**. The reinforcement tab(s) **610**, can be transparent. The reinforcement tabs **610** can be configured of a stiff rubber or plastic material.

[0072] In certain embodiments, the reinforcement tab **610** can be integrated in the face shield sheet **604**, and can comprise a generally thickened section of material. In other embodiments, the reinforcement tab **610** can comprise one or more independent stiffened strips, such as a plastic strip, with adhesive on one side. In such embodiments, the reinforcement tab **610** can be adhered to the upper area of the face shield sheet **604**. The reinforcement tab **610** can be installed on the inner facing surface or the outer facing surface of the face shield sheet **604**, and can, in some embodiments, extend across the length of the face shield sheet **604**.

[0073] The reinforcement tab **610** or band stiffens and thickens the face shield sheet **604** at a forehead mounting point **612**, which has multiple benefits. The reinforcement tab **610** can also stiffen the mounting holes **614** to allow for reusability of the shield and to avoid tearing of the face shield sheet **604**. In certain embodiments, holes **614** can be formed in the reinforcement tab **610** at locations that align with the mounting holes **614** on the face shield sheet **604**. The reinforcement tab **610** allows for the use of thinner films for the face shield sheet while maintaining the face shield integrity.

[0074] The reinforcement tab **610** can generally be formed of a stiff but pliable material (such a plastic) and can extend from one of the lateral sides **616** of the face shield sheet **604** to the other. In certain embodiments, the reinforcement tab **610** can be biased with a curvature so as to be concave and match the contour of a human head.

[0075] Mounting holes **614** can be formed in the face shield sheet **604** and/or the reinforcement tab **610**. The mounting holes **614** can be "punched" into the face shield and/or reinforcement tab.

[0076] The system **600** further comprises one or more shield clips **602**. The embodiment illustrated in FIG. **6**A illustrates two shield clips **602**. The shield clips **602** are configured to clip onto the face shield sheet **604** over the reinforcement tab **610**. In certain embodiments each of the shield clips **602** can be configured adjacent to one another and can be located to be nominally in the center **618** of the face shield sheet **604**. Further aspects of the shield clips **602** are provided herein.

[0077] As illustrated in FIG. **6**B, the face shield system **600** can further include a head mount **650**. The head mount **650** can comprise a cube or cuboid, formed of a generally soft or malleable material such as foam or rubber. The width

of the head mount **650** can generally match the width the reinforcement tab **610** but can be configured to be of a length matching or slightly shorter than the combined length of the two shield clips **602**. One surface of the head mount **650** can be coated with an adhesive. The adhesive can be covered again, by a cover (e.g. a removable paper cover).

[0078] The head mount **650** can be installed on the inner surface of the combined shield clips **602**, by removing the paper cover over the adhesive and adhering the head mount **650** in place. The outward extending shape of the head mount **650** allows the face shield system **100** to be comfortably worn in front of a human's face and can generally be fitted along the forehead region of the wearer. The shape also holds the top edge of the face shield sheet **604** away from the user.

[0079] The adhesive on the head mount **650** can be configured so that the head mount **650** can be removed and reinstalled on the face shield sheet **604** or shield clips **602**. The removal of the head mount **650** allows the components of the system **600** to be cleaned and sterilized individually before being reassembled for use.

[0080] FIG. **6**C illustrates a top view of the system **600**. In this view, the position head mount **650** is visible, affixed to the shield clips **602**.

[0081] FIG. **7**A-**7**D illustrates aspects of the shield clips **602**, in accordance with the disclosed embodiments. The shield clip **602** can generally comprise an outer rim **702** comprising a U-shaped frame with two clip arms **704** attached to a clip base **706**. The top of each of the clip arms **704** are configured with a keeper **708** configured to accept a clip dowel **710**. The clip dowel **710** is configured to rotate in the respective keepers **708** through nominally 180 degrees. Each keeper **708** further includes an internal spring **718** (the position of which is shown in FIG. **7**A for reference) configured to exert force on the clip dowel **710** and thereby bias the rotational position of the clip dowel **710**.

[0082] The clip dowel **710** is attached to a clip flap **712**. The clip flap **712** attached to the clip dowel **710**, and in operation with the keepers **708**, allows the clip flap **712** to be rotated away from the outer rim **702**. The springs in the keepers **708** bias the clip dowel **710** so that the clip flap **712** is biased into position against the clip flap brace **714**.

[0083] Each of the shield clips **602** is thus configured to attach to the face shield sheet **604**. The outer rim **702** is configured to be positioned on the outer surface of the face shield sheet **604** and the clip flap **712** is configured to be positioned on the inner surface of the face shield sheet **604**, such that the face shield sheet **604** is pinched between the outer rim **702** and the clip flap **712**. In certain embodiments, the clip flap **712** can have concave shape configured to similarly curve the face shield sheet **604** to wrap around the user's face/head.

[0084] The clip flap **712** can include an alignment brace **716**. The alignment brace **716** can lend structural support to the clip flap **712** and can further aid in the proper alignment of the head mount **650** on the clip flap **712**.

[0085] FIG. **7**B illustrates a rear elevation view of an exemplary shield clip **602**. As illustrated, the clip flap **712** can be configured to substantially fill the void created by the outer rim **702** and clip dowel **710**, when clip flap **712** is in it biased "closed" position. Similarly, FIG. **7**C shows a front elevation view of an exemplary shield clip **602**.

[0086] The face shield system **600** further comprises a cinch strap **800**, as illustrated in FIG. **8**. Aspects of the cinch strap **800** can include those described with respect to the cinch strap **160**, including aspects illustrated in FIGS. **2** and **3**. The cinch strap **800** can comprise a head band used to hold the face shield system **600** in place. To that end, the cinch strap **800** can be configured to fit around a user's head, and interface with the face shield sheet **604** at its two edges. In certain embodiments, multiple cinch straps **800** can be used to engage with multiple sets of mounting holes **614** on the face shield sheet **604** to hold the face shield sheet **604** in place.

[0087] The cinch strap **800** can include a first end **802** and a second end **804**. The first end **802** can comprise a grab tip **806** and the second end **804** can include a grab tip **808**. The respective grab tips **806** and **808** can be configured without teeth. After the grab tip **806** on the first end **802** of the cinch strap **800**, a first connection section **810** can include a plurality of teeth **814** along the first lateral side **812** of the cinch strap **800**, and along the second lateral side **816** of the cinch strap **800**. Similarly, after the grab tip **808** on the second end **804** of the cinch strap **800**, a second connection section **818** can include a plurality of teeth **820** along the first lateral side **812** of the cinch strap **800**, and along the second lateral side **816** of the cinch strap **800**.

[0088] The first connection section **810** can terminate at point **822** and the second connection section **818** can terminate at point **824**. The first lateral side **812** and second lateral side **816** of the cinch strap **800** can have smooth edges between the point **822** and the point **824**. The length of the first connection section **810** and the second connection section **818** can be selected to encompass a section of the strap length sufficient to engage the mounting holes **614** on the face shield sheet **604**, when wrapped around a range of regularly sized human heads. The smooth portion **826** of the cinch strap **800** is selected to be smooth to minimize discomfort caused by the interaction between the cinch strap and the wearer's head and/or ears.

[0089] Based on the foregoing, it can be appreciated that a number of embodiments, preferred and alternative, are disclosed herein. In an embodiment, a face shield comprises a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, a head mount, and a cinch strap inserted through at least one mounting hole in the face shield sheet. In an embodiment, the at least one mounting hole comprises two mounting holes formed on the face shield sheet. In an embodiment, the face shield system further comprises a chad configured in each of the at least one mounting hole. In an embodiment, the face shield system further comprises an adhesive disposed on the reinforcement tab. In an embodiment, the face shield system further comprises at least one hold point on the face shield sheet. In an embodiment, the head mount further comprises a cuboid cushion and an adhesive disposed on one side of the cuboid cushion. In an embodiment, the face shield system further comprises a protective cover overlaying the adhesive disposed on one side of the cuboid cushion. In an embodiment, the cinch strap further comprises a planar, flat strap. In an embodiment, the cinch strap further comprises a plurality of teeth formed on a first edge of the cinch strap and a plurality of teeth formed on a second edge of the cinch strap. In an embodiment, the cinch strap further comprises smooth distal ends. In an embodiment, the at least one reinforcement tab comprises a plurality of reinforcement tabs configured to be

disposed one on top of the other on the face shield sheet. In an embodiment, the at least one reinforcement tab is further configured to be concave.

[0090] In another embodiment, a face shield system comprises a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, a head mount, two mounting holes configured on the face shield sheet, at least one hold point on the face shield sheet, and a cinch strap inserted through at least one mounting hole in the face shield sheet. In an embodiment, the head mount further comprises a cuboid cushion, an adhesive disposed on one side of the cuboid cushion and a protective cover overlaying the adhesive disposed on one side of the cuboid cushion. In an embodiment, the cinch strap further comprises a planar, flat strap, a plurality of teeth formed on a first edge of the cinch strap, and a plurality of teeth formed on a second edge of the cinch strap.

[0091] In another embodiment, A face shield comprises a head covering, a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, a head mount, and a cinch strap inserted through at least one mounting hole in the face shield sheet and configured to be bound around the head covering. In an embodiment, the head covering comprises a helmet. In an embodiment, the cinch strap comprises two cinch straps, the two cinch straps being configured to attach to the face shield sheet and to be bound together at their respective tag ends. In an embodiment, the two cinch straps each further comprise a planar, flat strap, a plurality of teeth formed on a first edge of the cinch strap, and a plurality of teeth formed on a second edge of the cinch strap. In an embodiment, the head mount further comprises a cuboid cushion and an adhesive disposed on one side of the cuboid cushion.

[0092] In an embodiment, a face shield comprises a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, at least one shield clip configured to connect to the face shield sheet, a head mount configured to be attached to the at least one shield clip, and a cinch strap inserted through at least one mounting hole in the face shield sheet. In an embodiment, the at least one mounting hole comprises two mounting holes formed on the face shield sheet. In an embodiment, the at least one shield clip comprises two shield clips. In an embodiment, the two shield clips are adjacent to one another. In an embodiment, the two shield clips are attached to the face shield sheet over the at least one reinforcement tab. In an embodiment, the face shield further comprises an adhesive disposed on the at least one reinforcement tab. In an embodiment, the head mount further comprises a cuboid cushion and an adhesive disposed on one side of the cuboid cushion. In an embodiment, the cinch strap further comprises: a planar, flat strap. In an embodiment, the cinch strap further comprises a plurality of teeth formed on a first edge of the cinch strap and a second plurality of teeth formed on a second edge of the cinch strap. In an embodiment, the cinch strap further comprises smooth distal ends. In an embodiment, the at least one reinforcement tab comprises a plurality of reinforcement tabs configured to be disposed one on top of the other on the face shield sheet. In an embodiment, the at least one reinforcement tab is further configured to be concave. In an embodiment, the at least one shield clip comprises an outer rim comprising a U-shaped frame with two clip arms attached to a clip base and a clip flap. In an embodiment, he face shield further comprises a clip dowel connected to the clip flap and a keeper connected to each end of the clip dowel.

[0093] In an embodiment, a face shield system comprises a face shield sheet, at least one reinforcement tab affixed to the face shield sheet, at least one shield clip configured to connect to the face shield sheet, a head mount configured to attach to the at least one shield clip, two mounting holes configured on the face shield sheet, and a cinch strap inserted through at least one mounting hole in the face shield sheet. In an embodiment, the head mount further comprises a cuboid cushion, an adhesive disposed on one side of the cuboid cushion, and a protective cover overlaying the adhesive disposed on one side of the cuboid cushion. In an embodiment, the cinch strap further comprises a planar, flat strap, a plurality of teeth formed on a first edge of the cinch strap, and a plurality of teeth formed on a second edge of the cinch strap.

[0094] In an embodiment, a face shield comprises a face shield sheet, at least one shield clip configured to connect to the face shield sheet, a head mount configured to attach to the at least one shield clip, and a cinch strap inserted through at least one mounting hole in the face shield sheet and configured to be bound around the head covering. In an embodiment, the at least on shield clip comprises an outer rim comprising a U-shaped frame with two clip arms attached to a clip base and a clip flap. In an embodiment, the face shield further comprises a clip dowel connected to the clip flap and a keeper connected to each end of the clip dowel.

[0095] It will be appreciated that variations of the above-disclosed and other features and functions, or alternatives thereof, may be desirably combined into many other different systems or applications. Also, it should be appreciated that various presently unforeseen or unanticipated alternatives, modifications, variations or improvements therein may be subsequently made by those skilled in the art which are also intended to be encompassed by the following claims.

What is claimed is:

1. A face shield comprising:

a face shield sheet;

at least one reinforcement tab affixed to the face shield sheet;

at least one shield clip configured to connect to the face shield sheet;

a head mount configured to be attached to the at least one shield clip; and

a cinch strap inserted through at least one mounting hole in the face shield sheet.

2. The face shield of claim **1** wherein the at least one mounting hole comprises:

two mounting holes formed on the face shield sheet.

3. The face shield of claim **1** wherein the at least one shield clip comprises:

two shield clips.

4. The face shield of claim **3** wherein the two shield clips are adjacent to one another.

5. The face shield of claim **3** wherein the two shield clips are attached to the face shield sheet over the at least one reinforcement tab.

6. The face shield of claim **1** further comprising:

an adhesive disposed on the at least one reinforcement tab.

7. The face shield of claim **1** wherein the head mount further comprises:

a cuboid cushion; and

an adhesive disposed on one side of the cuboid cushion.

8. The face shield of claim **1** wherein the cinch strap further comprises:

a planar, flat strap.

9. The face shield of claim **1** wherein the cinch strap further comprises:

a plurality of teeth formed on a first edge of the cinch strap; and

a second plurality of teeth formed on a second edge of the cinch strap.

10. The face shield of claim **1** wherein the cinch strap further comprises:

smooth distal ends.

11. The face shield of claim **1** wherein the at least one reinforcement tab comprises;

a plurality of reinforcement tabs configured to be disposed one on top of the other on the face shield sheet.

12. The face shield of claim **1** wherein the at least one reinforcement tab is further configured to be concave.

13. The face shield of claim **1** wherein the at least one shield clip comprises:

an outer rim comprising a U-shaped frame with two clip arms attached to a clip base; and

a clip flap.

14. The face shield of claim **13** further comprising:

a clip dowel connected to the clip flap; and

a keeper connected to each end of the clip dowel.

15. A face shield system comprising:

a face shield sheet;

at least one reinforcement tab affixed to the face shield sheet;

at least one shield clip configured to connect to the face shield sheet;

a head mount configured to attach to the at least one shield clip;

two mounting holes configured on the face shield sheet; and

a cinch strap inserted through at least one mounting hole in the face shield sheet.

16. The face shield system of claim **15** wherein the head mount further comprises:

a cuboid cushion;

an adhesive disposed on one side of the cuboid cushion; and

a protective cover overlaying the adhesive disposed on one side of the cuboid cushion.

17. The face shield system of claim **15** wherein the cinch strap further comprises:

a planar, flat strap;

a plurality of teeth formed on a first edge of the cinch strap; and

a plurality of teeth formed on a second edge of the cinch strap.

18. A face shield comprising:

a face shield sheet;

at least one shield clip configured to connect to the face shield sheet;

a head mount configured to attach to the at least one shield clip; and

a cinch strap inserted through at least one mounting hole in the face shield sheet and configured to be bound around a head.

19. The face shield of claim **18** wherein the at least on shield clip comprises:

an outer rim comprising a U-shaped frame with two clip arms attached to a clip base; and

a clip flap.

20. The face shield of claim **19** further comprising:

a clip dowel connected to the clip flap; and

a keeper connected to each end of the clip dowel.

* * * * *