

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
22.05.2013 Bulletin 2013/21

(51) Int Cl.:
A41D 13/12 (2006.01)

(21) Application number: **12192805.5**

(22) Date of filing: 15.11.2012

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR
 Designated Extension States:
BA ME

(72) Inventor: **Chua, Mark Spencer G.**
Northbrook, IL Illinois 60062 (US)

(74) Representative: **McLeish, Nicholas Alistair**
Maxwell et al
Boult Wade Tennant
Verulam Gardens
70 Gray's Inn Road
London WC1X 8BT (GB)

(30) Priority: 17.11.2011 US 201113299132

(71) Applicant: **Medline Industries, Inc.,
Mundelein, IL 60060 (US)**

(54) **Adjustable chest drape**

(57) An adjustable drape (100) is manufactured from a flexible fabric layer and has a front major face (201) and a rear major face (101). One or more wearer attachment devices (102,103) are disposed along the rear major face (101), while one or more adjustment devices

(202,203) are disposed along the front major face (201). When the flexible fabric layer attached to the chest of a wearer (400), it is not visible from the behind the wearer (400). Accordingly, the adjustable drape (100) can be used to preserve patient dignity during advanced imaging procedures.

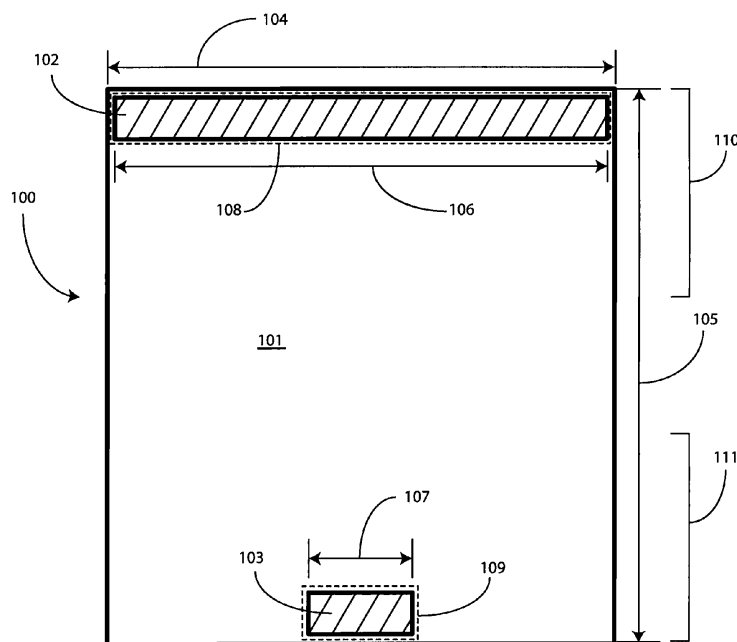


FIG. 1

Description

BACKGROUND

TECHNICAL FIELD

[0001] This invention relates generally to drapes, and more particularly to adjustable drapes.

BACKGROUND ART

[0002] Patients frequently wear gowns during medical procedures. The gowns allow medical professionals to easily access parts of the body under treatment, while at the same time preserving patient dignity by keeping the patient covered.

[0003] However, there are some medical procedures in which gowns cannot be worn. For example, wearing gowns during some diagnostic procedures can compromise the accuracy of the results. At the same time, patients frequently are not comfortable completely disrobing before a medical services provider.

[0004] It would be advantageous to be able to protect patient dignity while not compromising medical procedures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The accompanying figures, where like reference numerals refer to identical or functionally similar elements throughout the separate views and which together with the detailed description below are incorporated in and form part of the specification, serve to further illustrate various embodiments and to explain various principles and advantages all in accordance with the present invention.

[0006] FIG. 1 illustrates a front, elevation view of one explanatory adjustable drape configured in accordance with one or more embodiments of the invention.

[0007] FIG. 2 illustrates a rear, elevation view of one explanatory adjustable drape configured in accordance with one or more embodiments of the invention.

[0008] FIG. 3 illustrates a perspective view of one explanatory adjustable drape configured in accordance with one or more embodiments of the invention after having being partially formed for a wearer.

[0009] FIG. 4 illustrates a wearer wearing one explanatory adjustable drape configured in accordance with one or more embodiments of the invention.

[0010] FIGS. 5-7 illustrate alternate adjustable drapes configured in accordance with one or more embodiments of the invention.

[0011] FIGS. 8-12 illustrate alternate adjustment mechanisms suitable for use with embodiments of the invention.

[0012] Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example,

the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of embodiments of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0013] Embodiments of the invention are now described in detail. Referring to the drawings, like numbers indicate like parts throughout the views. As used in the description herein and throughout the claims, the following terms take the meanings explicitly associated herein, unless the context clearly dictates otherwise: the meaning of "a," "an," and "the" includes plural reference, the meaning of "in" includes "in" and "on." Relational terms such as first and second, top and bottom, and the like may be used solely to distinguish one entity or action from another entity or action without necessarily requiring or implying any actual such relationship or order between such entities or actions. Also, reference designators shown herein in parenthesis indicate components shown in a figure other than the one in discussion. For example, talking about a device (10) while discussing figure A would refer to an element, 10, shown in figure other than figure A.

[0014] New imaging technology, such as the Fourmetric™ 4D imaging system manufactured by Diers Biomedical Solutions, are configured to take images of a patients back by three-dimensionally mapping a patient's body and spine. Such devices are useful in diagnosis and treatment of many forms of spinal deformities such as scoliosis, as well as in taking measurements of body statistics and posture. Such devices function by imaging an uncovered back of the patient, with the images being taken against a green screen. For the imaging to properly be completed, no other objects can interfere with the photograph. Moreover, it is recommended that patients completely disrobe prior to imaging for successful imaging to occur.

[0015] Embodiments of the present invention provide an adjustable drape, which can be configured to match the contours of the patient, which allows complex imaging machines to function properly while still maintaining the dignity of the patient. It is contemplated that some patients may not be comfortable disrobing during such imaging procedures. For example, patients are frequently required to stand facing the green screen, walk on a treadmill, or perform another activity during the imaging process. Frequently, multiple people will be in the room during the procedure, including a camera technician, a physician, and sometimes a nurse. Many patients, and especially females or adolescents, will not be comfortable exposing a bare chest to each person in the room. The application of a prior art drape to the patient is not a viable solution for at least the reason that the imaging process will be compromised if any portion of the drape is visible to the camera.

[0016] Embodiments of the present invention offer a unique, one-size-fits-all adjustable drape that a physician can customize to a particular patient, and that can be used to fully cover an exposed chest without being visible from the dorsal side of the patient. Accordingly, it does not interfere with complex imaging procedures.

[0017] Turning now to FIGS. 1 and 2, illustrated therein is one explanatory adjustable drape 100 configured in accordance with one or more embodiments of the invention. FIG. 1 illustrates a rear, elevation view of the adjustable drape 100, with the rear, or "patient," major face 101 being visible. Likewise, FIG. 2 illustrates a front, elevation view of the adjustable drape 100, with a front, or "health care services provider," major face 201 being visible.

[0018] In one embodiment, the adjustable drape 100 is manufactured from a soft, flexible fabric layer. One example of such a soft, flexible fabric is a 45-gram spunbond-meltblown-spunbond (SMS) material. Other materials can be used for the adjustable drape 100 as well, including, for example, cotton or synthetic fiber textiles. Additionally, various woven, non-woven, hydroentangled materials, and/or combinations thereof, absorbent airlaid, spunlace, blends of polyester, polypropylene, polyethylene, urethane, and/or combinations thereof, using various methods, including the SMS method, a spunbond-metblown-metblown-spunbond method (SMMS), and a spunbond-metblown-metblown-spunbond method (SMMM). Examples of suppliers of such materials include Cardinal Health in Dublin, Ohio, Kimberly Clark in Neena, Wisconsin, Molnycke Health Care in Newtown, Pennsylvania, and Precept Medical Products, Inc., in Arden, North Carolina. These materials and methods are explanatory only, as others will be readily apparent to those of ordinary skill in the art having the benefit of this disclosure. For example, one or more antimicrobial layers can be added to enhance antimicrobial protection.

[0019] Illustrative dimensions now are provided to further describe one embodiment suitable for use in imaging applications. It will be clear to those of ordinary skill in the art having the benefit of this disclosure that these dimensions are examples only, provided to present a clearer image of one embodiment, and can readily be modified based upon application or customer demand.

[0020] In the explanatory embodiment of FIGS. 1 and 2, the adjustable drape 100 is rectangular in shape. This explanatory adjustable drape 100 has a width 104 of about ten inches, and a height 105 of about twelve inches. The term "about," when used to modify dimensions or other specifications herein, is used to include manufacturing and other tolerances that occur during the fabrication of the adjustable drape 100. For instance, a measurement of 9.82 inches can be either "about ten inches" or "substantially ten inches" when the manufacturing specifications are ten inches plus or minus 0.20 inches, where the 0.20 inches are included to accommodate component and manufacturing tolerances.

[0021] One or more wearer attachment devices

102,103 can be coupled to the rear major face 101 of the adjustable drape. In the illustrative embodiment of FIG. 1, a first wearer attachment device 102 is affixed to an upper region 110 of the rear major face 101, while a second wearer attachment device 103 is affixed to a lower region 111 of the rear major face 101. The number of wearer attachment devices 102,103 and their locations are illustrative only, as other numbers or locations, as well as other orientations will be obvious to those of ordinary skill in the art having the benefit of this disclosure. Illustrating by example, while the wearer attachment devices 102,103 are shown as being oriented horizontally in FIG. 1, or parallel to the width 104 of the adjustable drape 100, they can also be arranged vertically along the sides of the adjustable drape 100 such that they are parallel with the height 105.

[0022] In the illustrative embodiment of FIG. 1, the upper wearer attachment device 102 has a length 106 that is greater than the length 107 of the lower wearer attachment device 103. Of course, the opposite could be true in an alternate embodiment. Moreover, the upper wearer attachment device 102 can have the same length as the lower wearer attachment device 103 in a third embodiment. In FIG. 1, the upper wearer attachment device 102 is between about nine and about ten inches in length 106. The lower wearer attachment device 103 is about two inches in length 107.

[0023] The wearer attachment devices 102,103 are configured to attach to a patient, which in one embodiment comprises attachment directly to the patient's skin. For instance, in one embodiment, the upper wearer attachment device 102 is configured to adhere to the skin of a patient's chest between the breast and the clavicle region. The lower wearer attachment device 103 can be configured to adhere to the skin of the patient's torso in the midriff region. In this fashion, the rear major face 101 would cover the patient's breasts.

[0024] The wearer attachment devices 102,103 can take a variety of forms. In one embodiment, the wearer attachment devices 102,103 comprise an adhesive component, such as double-sided tape or a releasable adhesive. One example of a suitable tape for use as the wearer attachment devices 102,103 is a medical-grade adhesive tape. The adhesive tape can have a width of about two inches in one embodiment. The adhesive of the tape can be "releasable" adhesive such that the adjustable drape 100 can be repositioned on the patient's skin as necessary.

[0025] In one embodiment, the adhesive portion of the tape can be covered with a releasable covering 108,109. When the adjustable drape 100 is ready for use, the releasable coverings 108,109 can be removed to reveal the adhesive material. Pressing the adhesive material against the patient causes the adjustable drape 100 to be coupled to the patient's skin.

[0026] It will be clear to those of ordinary skill in the art having the benefit of this disclosure that other coupling elements can be used for the wearer attachment devices

102,103. Examples include static adhesion systems, suction cups, clasps, or other gentle fastening elements. In another embodiment, the wearer attachment devices 102,103 are a hook and loop fastener, with one element being disposed along the rear major face 101 and the other being adhered to the patient. In another embodiment, the wearer attachment devices 102,103 comprise an adhesive gel. In another embodiment, the wearer attachment devices 102,103 comprise adhesive putty. This list is not inclusive. The wearer attachment devices 102,103 need only be configured to attach the adjustable drape 100 to the patient.

[0027] As shown in FIG. 2, one or more adjustment devices 202,203 can then be disposed at various intervals along the front major face 201 of the adjustable drape 100. The adjustment devices 202,203 can be used, in one embodiment, to laterally adjust the adjustable drape 100 so as to cinch or otherwise conform the adjustable drape 100 about the patient's torso. In so doing, the adjustment devices 202,203 allow the patient or physician to configure the adjustable drape 100 to conform to a particular patient, regardless of size. Accordingly, the adjustable drape is configured with a "one size fits all" capability. This universal sizing reduces inventory, makes drape selection more efficient, and saves cost.

[0028] As with the wearer attachment devices 102,103, the adjustment devices 202,203 can be disposed at a variety of locations along the front major face 201. In the illustrative embodiment of FIG. 2, a first adjustment device 202 is affixed to an upper region 210 of the front major face 201, while a second adjustment device 203 is affixed to a lower region 211 of the front major face 201. The number and location of the adjustment devices 202,203 are again illustrative only, as other quantities, locations, or orientations will be obvious to those of ordinary skill in the art having the benefit of this disclosure. Illustrating by example, while adjustment devices 202,203 are shown as being oriented horizontally in FIG. 2, they can also be arranged vertically along the sides of the adjustable drape 100. Additionally, rather than using two wearer attachment devices 202,203, one, three, or four or more devices can be used.

[0029] In the illustrative embodiment of FIG. 2, the upper adjustment device 202 has a length 204 that is less than the length 205 of the lower adjustment device 203. Of course, the opposite could be true in an alternate embodiment. Moreover, the upper adjustment device 202 can have the same length as the lower adjustment device 203 in a third embodiment. In FIG. 2, the upper adjustment device 202 is about four inches in length 204. The lower adjustment device 203 is about eight inches in length 205.

[0030] The adjustment devices 202,203 can take a variety of forms. One form is shown in FIG. 2, while others will be shown in subsequent figures. In one embodiment the adjustment devices 202,203 are flexible, malleable metal strips or wires. Where a malleable metal is used, the same can be easily deformed without breaking, there-

by allowing the patient or a physician to twist, pinch, cinch, fold, or otherwise shape the adjustable drape 100 to the patient. Not only does this adjustability allow the adjustable drape 100 to better fit the patient, but it allows the adjustable drape 100 to be contoured about the patient so as not to be visible from the back. Accordingly, the adjustable drape 100 can be used to preserve patient dignity in diagnostic procedures such as the Fourmetric™ 4D imaging process described above.

[0031] In other embodiments, the adjustment devices 202,203 can be drawstrings, drawstrings and clamps, adhesive tape, hook and loop devices, and so forth. Some of these will be shown in FIGS. 8-12 below. As noted above, the adjustment devices 202,203 can be placed at various locations along the adjustable drape 100, such as at the bottom, in the middle, vertically or horizontally, or combinations thereof.

[0032] In the explanatory embodiment of FIGS. 1 and 2, the adjustment devices 202,203 are disposed on a major face, i.e., front major face 201, of the adjustable drape 100 that is disposed opposite the major face, i.e., rear major face 101, to which the wearer attachment devices 102,103 are disposed. Accordingly, a patient may first apply the adjustable drape 100 by affixing the wearer attachment devices 102,103 to the skin. Subsequently, the patient or a physician can then adjust the adjustment devices. In an alternate embodiment, the adjustment devices 202,203 may be disposed on a major face that is common with the wearer attachment devices 102,103. Turning to FIG. 3, illustrated therein is the adjustable drape 100 of FIGS. 1 and 2 after the adjustment devices 202,203 have been contoured. As shown the front major face 201 has become curved and contoured.

[0033] FIG. 4 illustrates a wearer 400 wearing the adjustable drape 100. The wearer 400 has donned the adjustable drape 100 in accordance with the following method steps: obtaining the adjustable drape 100, attaching the one or more wearer attachment devices (102,103) to the, and adjusting the one or more adjustment devices (202,203) to adjust the adjustable drape 100 to conform to the chest. As shown, the adjustable drape 100 preserves patient dignity by covering the breasts of the wearer 400. At the same time, the adjustable drape 100 is not visible from the rear of the wearer. Accordingly, it will not interfere with imaging procedures, even when the wearer 400 is running on a treadmill as shown in FIG. 4.

[0034] Turning to FIGS. 5 and 6, illustrated therein are alternate adjustable drapes 500,600. While the adjustable drape (100) of FIGS. 1 and 2 was rectangular, FIGS. 5 and 6 show just a few shapes of the many, many shapes that can be used in accordance with embodiments of the invention. FIG. 5 illustrates an adjustable drape 500 having a complex ovular shape, which resembles a "figure 8." The adjustable drape 600 of FIG. 6 is trapezoidal. Other shapes will be obvious to those of ordinary skill in the art having the benefit of this disclosure.

[0035] FIG. 7 illustrates an alternate adjustable drape 700 having additional fitting devices. The adjustable

drape 700 of FIG. 7 can include adjustment devices and wearer attachment devices as described above. In addition to these components, the adjustable drape 700 of FIG. 7 includes one or more preformed perforations 701, 702, 703, 704 disposed along each side of the adjustable drape 700. In one embodiment, rather than physically manipulating an adjustment device, the patient or physician can simply tear the adjustable drape 700 along the preformed perforations 701, 702, 703, 704 until the adjustable drape 700 reaches the appropriate size. In another embodiment, the necessary preformed perforations 701, 702, 703, 704 can be torn in addition to manipulating other adjustment devices disposed along the adjustable drape 700.

[0036] Turning now to FIGS. 8-9, illustrated therein is one embodiment of an alternate adjustment device that can be attached to an adjustable drape in accordance with one or more embodiments of the invention. As shown in FIG. 8, the adjustment device comprises a first portion 800 and a second portion 801. Each portion 800, 801 can be attached to a major face of the adjustable drape and then linked together to cinch excess material. The first portion 800 has a plurality of teeth 802, and an insertion tip 803. In one embodiment, the first portion 800 is constructed from a thermoplastic material by way of an injection molding process.

[0037] Each of the plurality of teeth 802, which in one embodiment are disposed along one face of the first portion 800 between the insertion tip 803 and the major face of the adjustable gown, includes an inclined leading edge and a trailing edge that is substantially normal to the first portion 800. The plurality of teeth 802 thereby forms a series of ramps running from the insertion tip 803 along the first portion 800. The face opposite the plurality of teeth 802, in one embodiment, is substantially smooth.

[0038] The first portion 800 shown in FIG. 8 is but one illustrative embodiment. It will be clear to those of ordinary skill in the art having the benefit of this disclosure that modifications can be made to the first portion 800 without departing from the spirit and scope of the invention. For example, the plurality of teeth 802 can extend across the insertion tip 803. Further, in one embodiment, rather than using a plurality of teeth 802, a plurality of indentations can be used. Additionally, a plurality of teeth 802 can be placed on both faces of the first portion 800.

[0039] The second portion 801 includes a fastening head 804. In one embodiment, the second portion 801 manufactured from a thermoplastic material in an injection molding process. The fastening head 804 has an aperture 805 through which the insertion tip 803 can pass. Within the aperture 805 is a latch 806 that is configured to engage one or more of the plurality of teeth 802 so as to prevent the first portion 800, once inserted into the fastening head 804, from being withdrawn. In one embodiment, the latch 806 is configured as a cantilever arm that passes along the inclined leading edge of each tooth and than "latches" by snapping down along the substantially normal trailing edge of each tooth. As

such, the latch 806 facilitates a one-way, cinchable but not releasable, fastener capable of adjusting the width or length of the adjustable drape to which it is attached.

[0040] Turning now to FIG. 9, illustrated therein is a wearer 400 cinching the first portion 800 into the fastening head 804. As shown, the wearer 400 cinches an adjustable gown by pulling the first portion 800 through the fastening head 804. The wearer 400 can thus tighten the first and second portion while being confident the latch 806 will not disengage.

[0041] Turning now to FIG. 10, illustrated therein is another adjustment device. FIG. 10 illustrates a plurality of snap elements 1001, 1002 that can be coupled together to cinch a gather amount 1003 of an adjustable drape together. For instance, in FIG. 10, snap element 1001 is coupled to snap element 1002. This causes a first amount of the gown material to be gathered by a base member 1005 attached to various portions of the adjustable drape.

[0042] In this embodiment, some snap elements, e.g., snap element 1001 are socket snap elements, while other snap elements, e.g., snap element 1002, is a post snap element. The snap elements 1001, 1002 are coupled to the base member 1005, which can be a layer of sturdy fabric, such as twill. The base member 1005 can be sewn to the adjustable drape, or adhered by other methods, such as adhesives or thermal bonding.

[0043] Turning now to FIGS. 11 and 12, illustrated therein is yet another adjustment device configured in accordance with one or more embodiments of the invention. In this illustrative embodiment, the adjustment device drawstrings 1101, 1102, 1103, 1104. The drawstrings 1101, 1102, 1103, 1104 in this example are configured to cinch the front portion of the adjustable drape 1100. In this illustrative embodiment, the drawstrings 1101, 1102, 1103, 1104 are disposed within drawstring channels that pass along the adjustable drape 1100, although they may simply be attached to the front of the adjustable drape 1100 as well. As shown in FIG. 12, when the drawstrings 1101, 1102, 1103, 1104 are tied together, the adjustable drape 1100 becomes cinched to fit the wearer.

[0044] In the foregoing specification, specific embodiments of the present invention have been described. However, one of ordinary skill in the art appreciates that various modifications and changes can be made without departing from the scope of the present invention as set forth in the claims below. Thus, while preferred embodiments of the invention have been illustrated and described, it is clear that the invention is not so limited. Numerous modifications, changes, variations, substitutions, and equivalents will occur to those skilled in the art without departing from the spirit and scope of the present invention as defined by the following claims. Accordingly, the specification and figures are to be regarded in an illustrative rather than a restrictive sense, and all such modifications are intended to be included within the scope of present invention. The benefits, advantages, solutions to problems, and any element(s) that may

cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential features or elements of any or all the claims.

Claims

1. An adjustable drape, comprising:

a flexible fabric layer having a front major face and a rear major face;
one or more wearer attachment devices disposed along the rear major face;
and
one or more adjustment devices disposed along the front major face;
wherein the flexible fabric layer is configured, upon attachment to a chest of a wearer, not to be visible from the behind the wearer.

2. The adjustable drape of claim 1, wherein the one or more wearer attachment devices comprise a first wearer attachment device disposed along an upper region of the rear major face and a second wearer attachment device disposed along a lower region of the rear major face.

3. The adjustable drape of claim 2, wherein the first wearer attachment device has a length greater than that of the second wearer attachment device.

4. The adjustable drape of claim 2 or 3, wherein the first wearer attachment device and the second wearer attachment device comprise adhesive devices.

5. The adjustable drape of claim 4, further comprising releasable coverings disposed atop the adhesive devices.

6. The adjustable drape of any preceding claim, wherein the one or more adjustment devices comprise a first adjustment device disposed along an upper region of the front major face and a second adjustment device disposed along a lower region of the front major face.

7. The adjustable drape of claim 6, wherein the first adjustment device has a length less than that of the second adjustment device.

8. The adjustable drape of claim 6 or 7, wherein the first adjustment device and the second adjustment device comprise malleable metal.

9. The adjustable drape of claim 6, 7 or 8, wherein the first adjustment device and the second adjustment device comprise flexible wire.

10. The adjustable drape of claim 6 or 7, wherein the first adjustment device and the second adjustment device comprise a first element having a plurality of teeth and an insertion tip and a second element having a fastening head into which the insertion tip can be placed to engage one or more of the plurality of teeth with the fastening head.

11. The adjustable drape of claim 6 or 7, wherein the first adjustment device comprises one of post snap elements or socket snap elements and the second adjustment device comprises another of the post snap elements or the socket snap elements.

12. The adjustable drape of claim 6 or 7, wherein the first adjustment device and the second adjustment device each comprise drawstrings.

13. The adjustable drape of any preceding claim, wherein the flexible fabric layer is manufactured from SMS.

14. The adjustable drape of any preceding claim, further comprising one or more preformed perforations running across the flexible fabric layer.

15. The adjustable drape of any preceding claim, wherein the flexible fabric layer is one of complex ovular or trapezoidal.

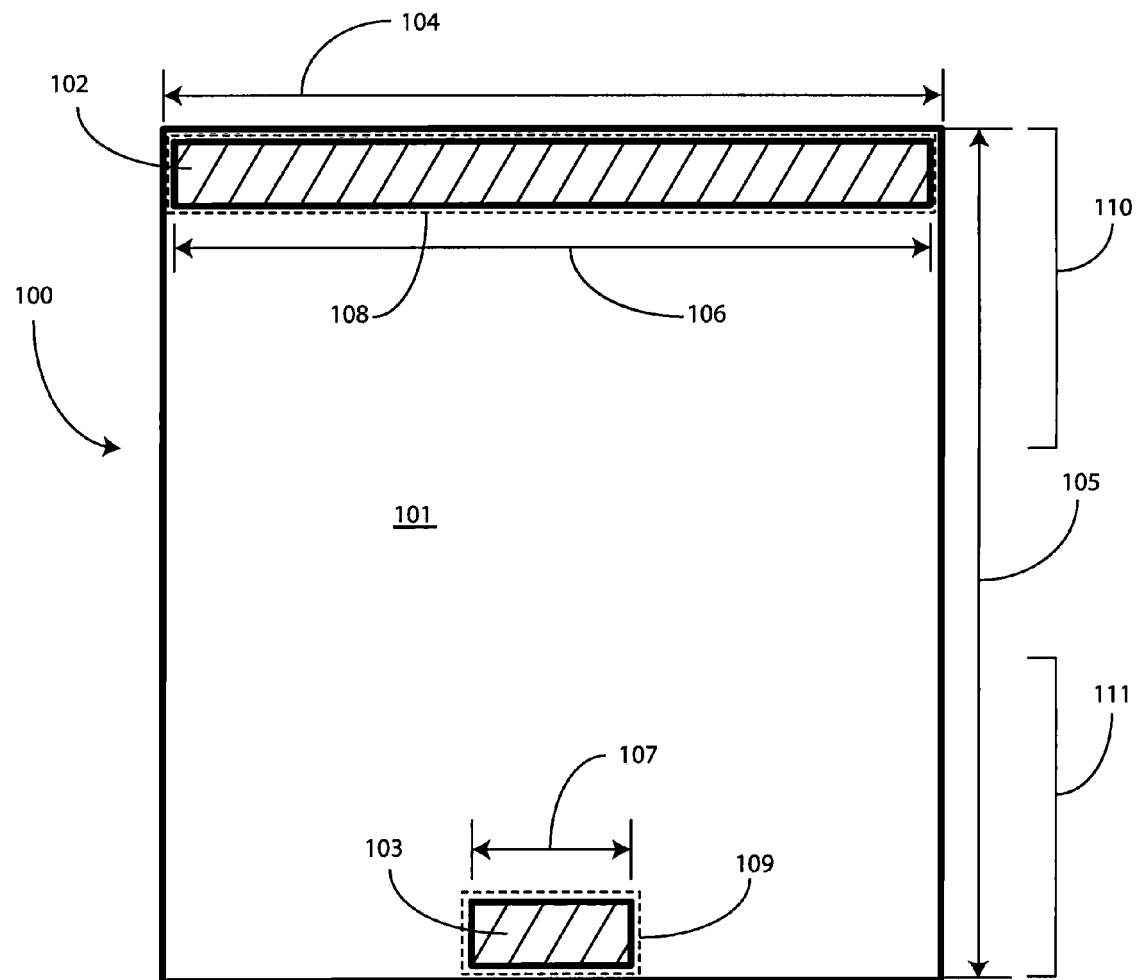


FIG. 1

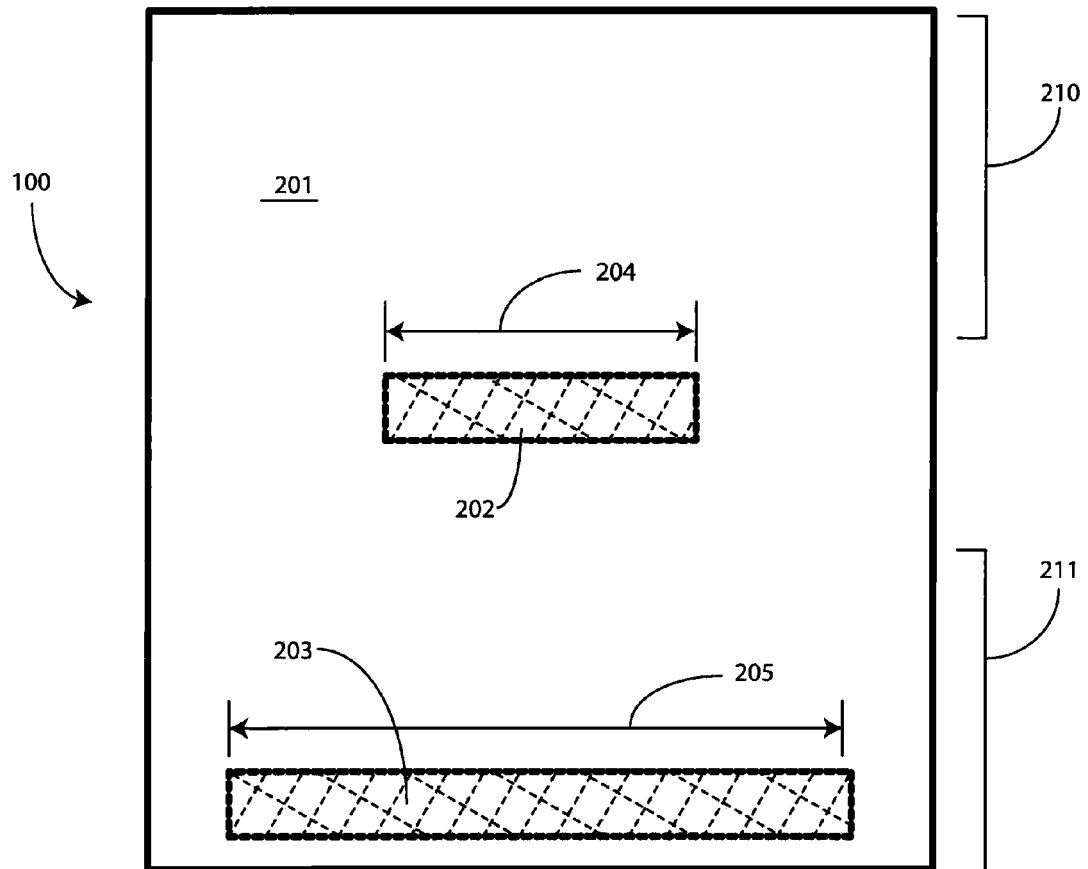


FIG. 2

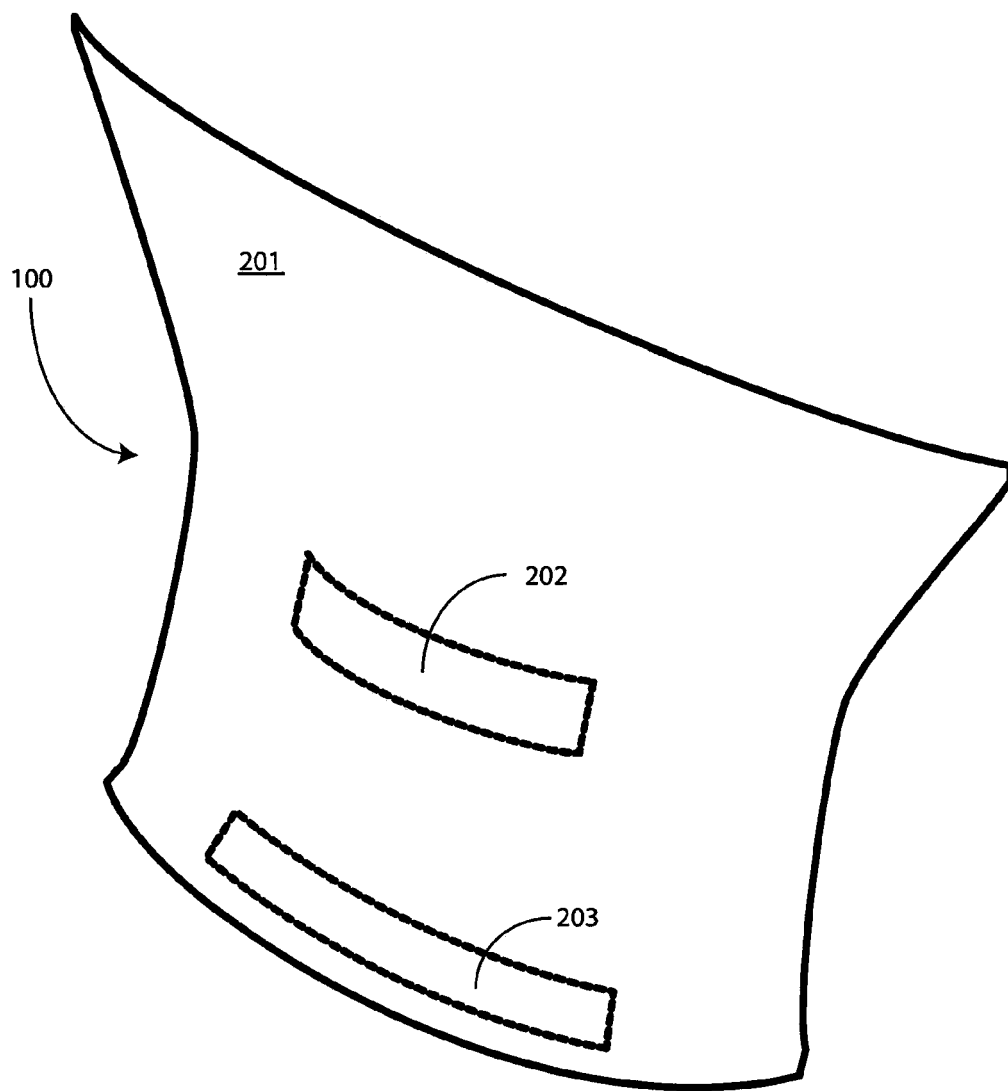


FIG. 3

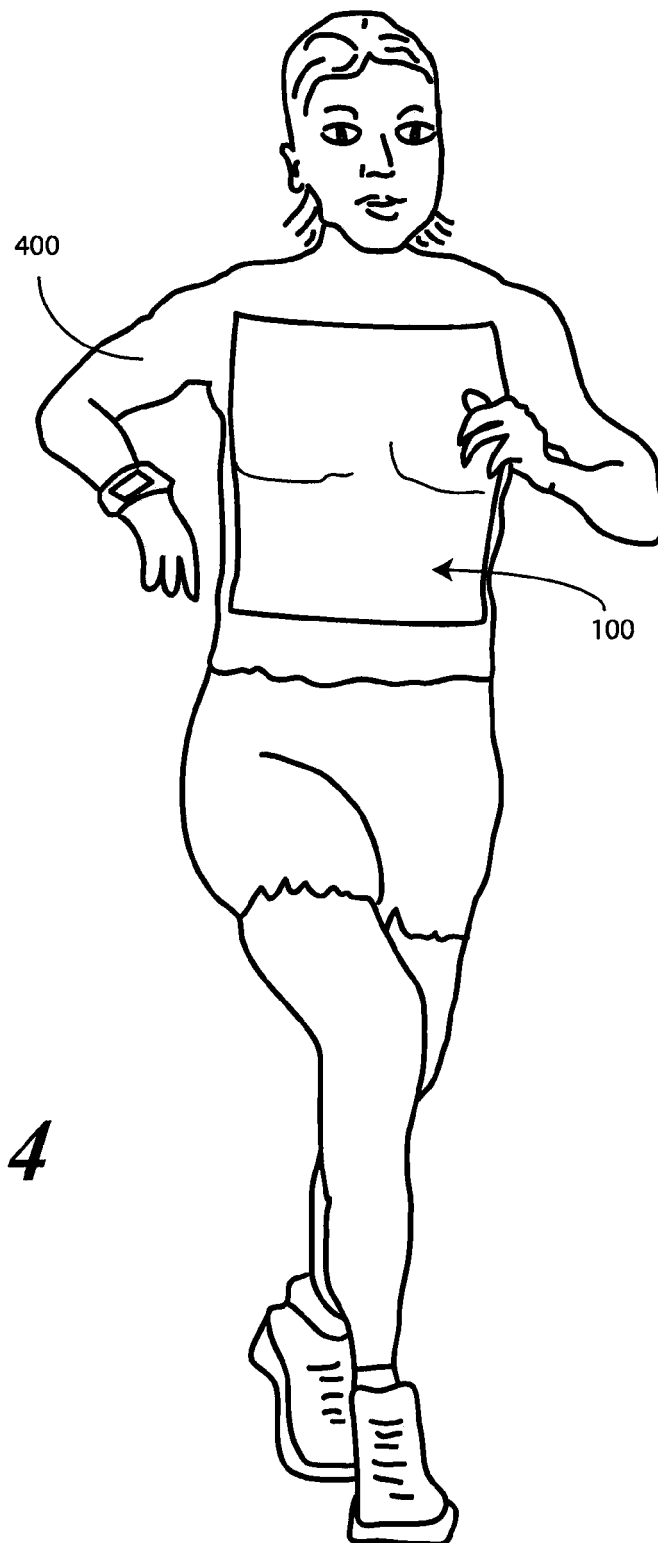


FIG. 4

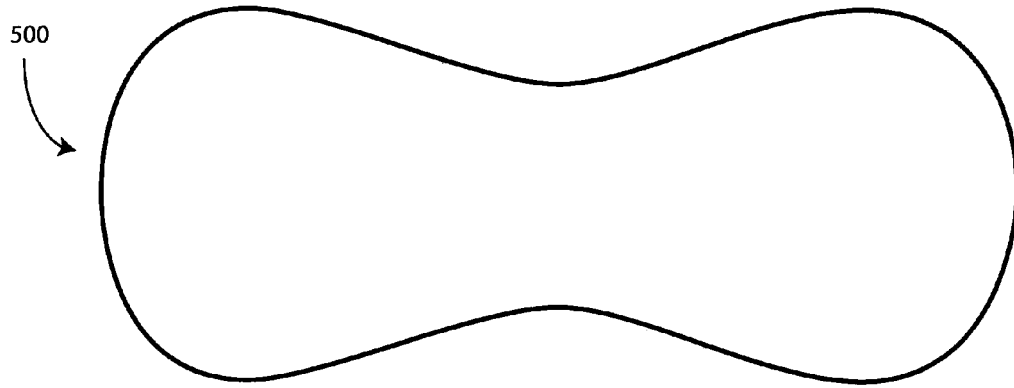


FIG. 5

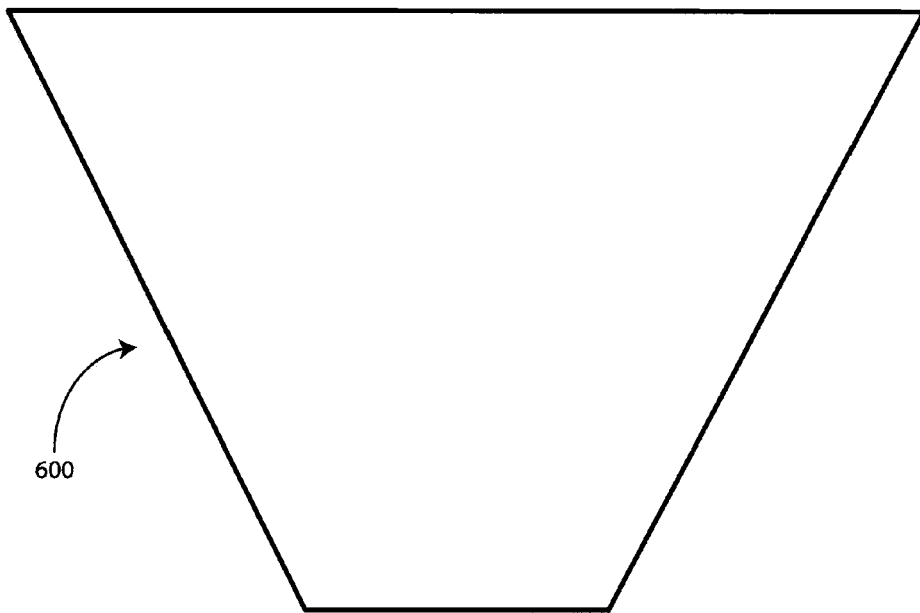


FIG. 6

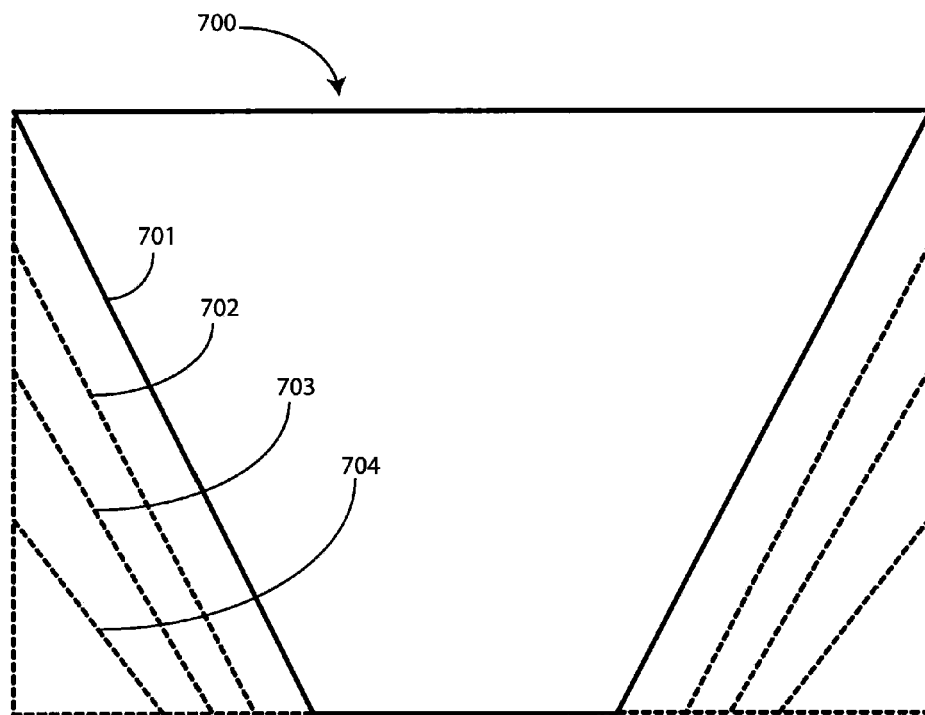


FIG. 7

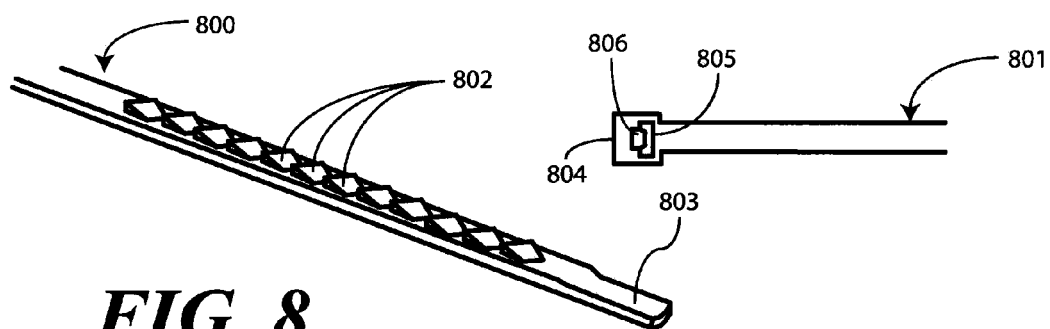


FIG. 8

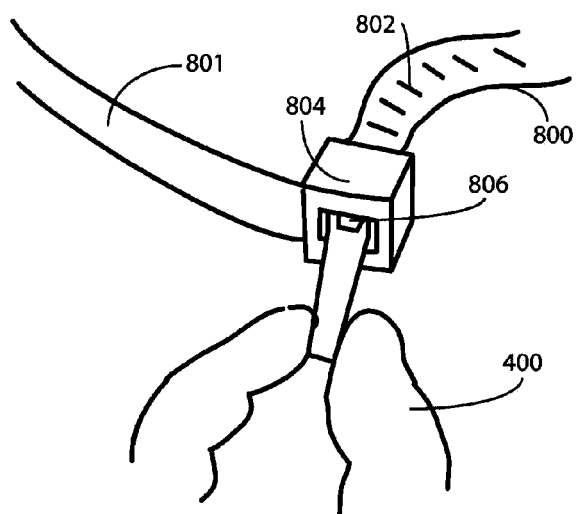


FIG. 9

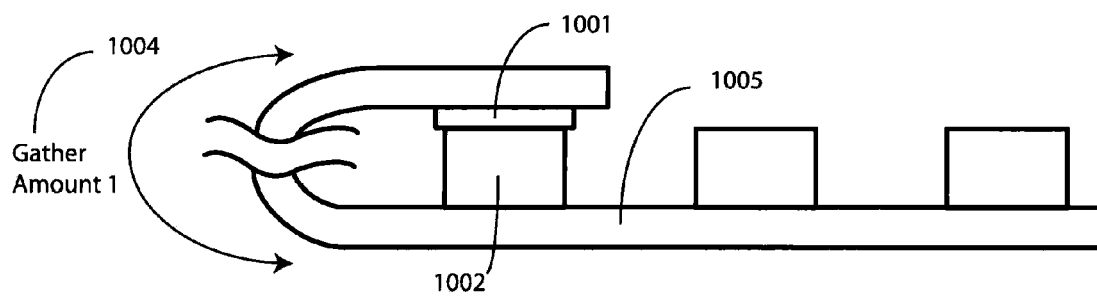


FIG. 10

FIG. 11

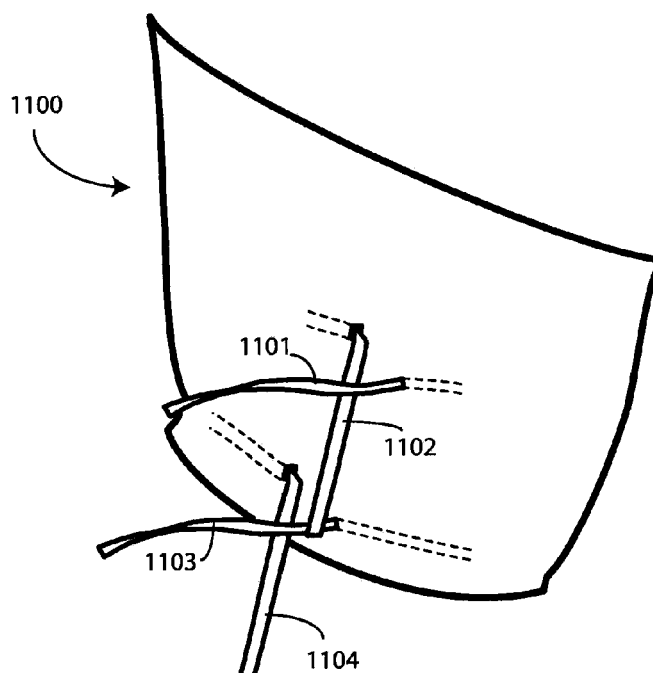


FIG. 12

