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(54) **ARRANGEMENT FOR ATTACHING AN APPENDAGE TO A GARMENT TO PROMOTE FREE MOVEMENT**

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(57) **ABSTRACT**

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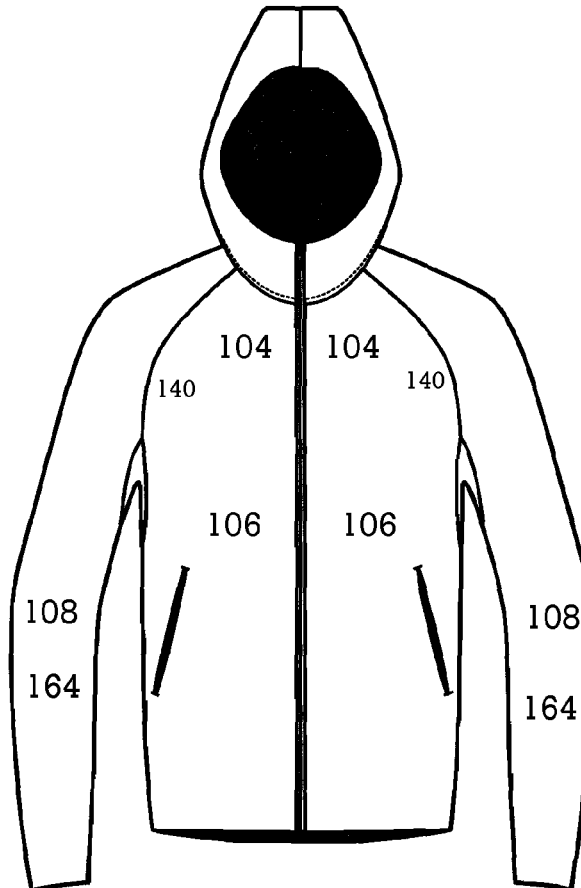
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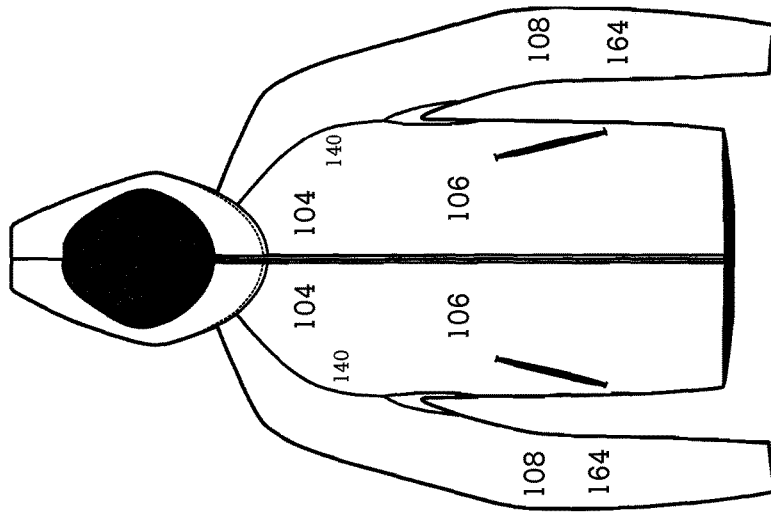
The present invention relates to an arrangement for attaching an appendage to a garment to promote free movement, for example through the use of quadrilateral gusseting, darting and sloping seams.

100



162

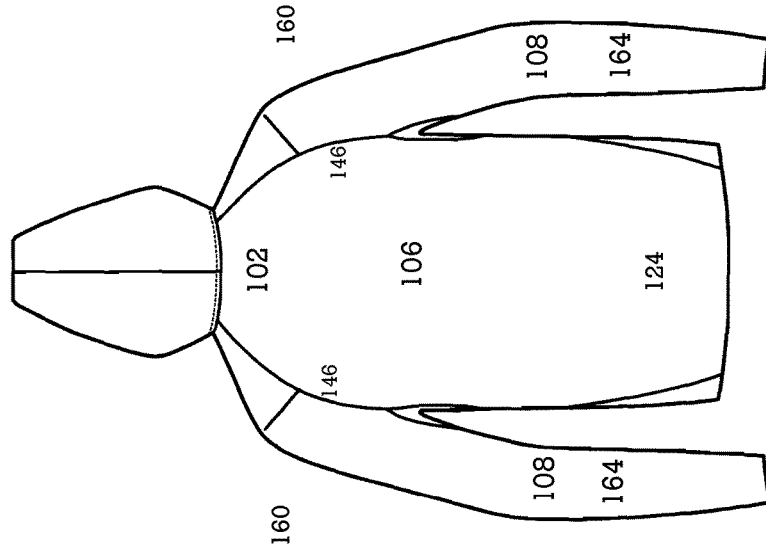
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162

FIG. 1

100



162

FIG. 2

100

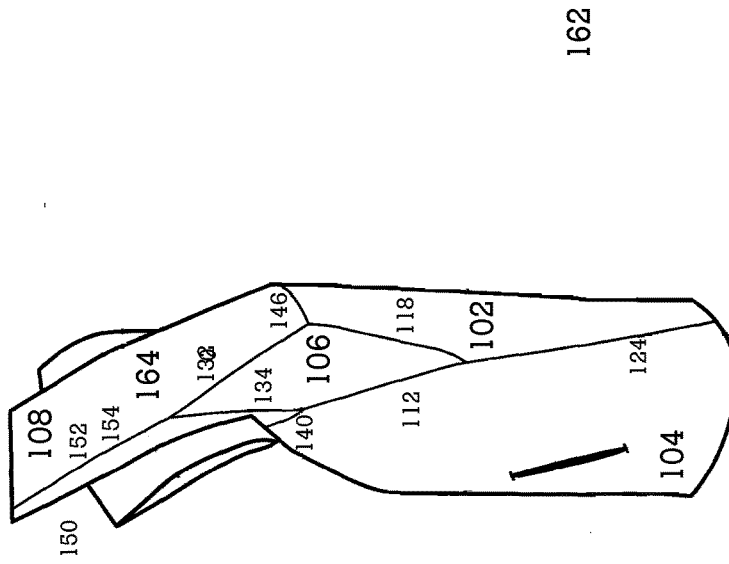
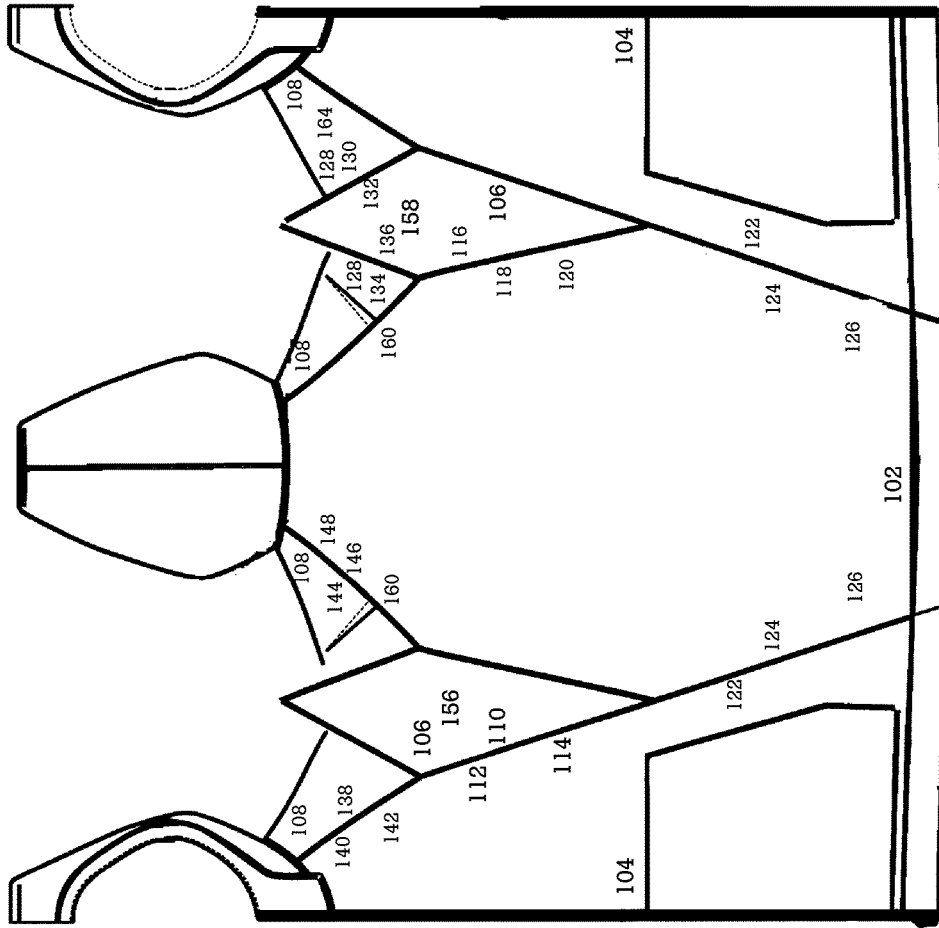


FIG. 3

100



162

FIG. 4

**ARRANGEMENT FOR ATTACHING AN
APPENDAGE TO A GARMENT TO
PROMOTE FREE MOVEMENT**

CROSS-REFERENCE TO RELATED
APPLICATIONS

[0001] This application claims priority to U.S. Provisional Patent Application No. 62/528,423 filed on Jul. 3, 2017, entitled "ARRANGEMENT FOR ATTACHING AN APPENDAGE TO A GARMENT TO PROMOTE FREE MOVEMENT," the disclosure of which is incorporated herein by reference.

BACKGROUND

1. Field

[0002] The present invention relates to garment construction and use.

2. Description of Related Art

[0003] Athleisure is a strong fashion trend in garment market. Consumers are demanding garments that are at once flattering, casual yet sophisticated, and comfortable both at rest and during athletics.

[0004] One challenge faced by designers in the athleisure market is how to make garments that provide freedom of movement without being baggy—better yet while being form-fitting and flattering.

[0005] For example, when designing tops, there is a need to promote free shoulder movement in a way other than by adding excess material in the underarm area that bags when one's arms are lowered. A similar need exists for other garment and personal appendages, for example legs.

SUMMARY

[0006] The present invention is directed to this need.

[0007] According to one aspect of the present invention, there is provided a garment, having a back panel, a front panel, a quadrilateral gusset, and a sleeve, wherein:

[0008] a first edge of the quadrilateral gusset forms a first seam with a first edge portion of the front panel,

[0009] a second edge of the quadrilateral gusset forms a second seam with a first edge portion of the back panel,

[0010] a second edge portion of the front panel forms a third seam with a second edge portion of the back panel,

[0011] an end of the sleeve forms a fourth seam with a third edge of the quadrilateral gusset and a fifth seam with a fourth edge of the quadrilateral gusset,

[0012] a first edge portion of the sleeve forms a sixth seam with a third edge portion of the front panel,

[0013] a second edge portion of the sleeve forms a seventh seam with a third edge portion of the back panel, and

[0014] a third edge portion of the sleeve forms an eighth seam with a fourth edge portion of the sleeve.

[0015] The quadrilateral gusset may be symmetrical about a major axis or a minor axis.

[0016] The quadrilateral gusset may have the shape of a kite, a parallelogram, or a rhombus.

[0017] The sleeve may have a dart at the second edge portion.

[0018] The sixth seam may meet the first seam which may meet the third seam, sloping from front to back.

[0019] At least one of the back panel, the front panel, the quadrilateral gusset and the sleeve may include resilient material, for example a blend of cotton, nylon and spandex, for example a blend of 85% cotton, 10% nylon and 5% spandex.

[0020] According to another aspect of the present invention, there is provided a method of making a garment having a back panel, a front panel, a quadrilateral gusset, and a sleeve, including:

[0021] forming a first seam between a first edge of the quadrilateral gusset and a first edge portion of the front panel,

[0022] forming a second seam between a second edge of the quadrilateral gusset forms a first edge portion of the back panel,

[0023] forming a third seam between a second edge portion of the front panel and a second edge portion of the back panel,

[0024] forming a fourth seam between an end of the sleeve and a third edge of the quadrilateral gusset,

[0025] forming a fifth seam between the end of the sleeve and a fourth edge of the quadrilateral gusset,

[0026] forming a sixth seam between a first edge portion of the sleeve and a third edge portion of the front panel,

[0027] forming a seventh seam between a second edge portion of the sleeve and a third edge portion of the back panel, and

[0028] forming an eighth seam between a third edge portion of the sleeve and a fourth edge portion of the sleeve.

[0029] The method may further include placing a dart in the sleeve at the second edge portion.

[0030] The method may further include aligning the sixth seam to meet the first seam and the first seam to meet the third seam, sloping from front to back.

[0031] According to another aspect of the present invention, there is provided a garment having a body and an appendage, and including a quadrilateral gusset that connects the appendage to the body. The body may include a back panel and a front panel and the appendage may be a sleeve, such that the quadrilateral gusset connects the sleeve, the front panel and the back panel.

[0032] According to another aspect of the present invention, there is provided a method of making a garment having a body and an appendage, by connecting the appendage to the body with a quadrilateral gusset. The body may include a back panel and a front panel and the appendage may be a sleeve, such that connecting the appendage to the body includes connecting the sleeve, the front panel and the back panel with the quadrilateral gusset.

[0033] Further aspects and advantages of the present invention will become apparent upon considering the following drawings, description, and claims.

DESCRIPTION

[0034] The invention will be more fully illustrated by the following detailed description of non-limiting specific embodiments in conjunction with the accompanying drawing figures. In the figures, similar elements and/or features may have the same reference label. Further, various elements of the same type may be distinguished by following the reference label with a second label that distinguishes among the similar elements. If only the first reference label is identified in a particular passage of the detailed descrip-

tion, then that passage describes any one of the similar elements having the same first reference label irrespective of the second reference label.

BRIEF DESCRIPTION OF THE DRAWINGS

[0035] FIG. 1 is a front elevation view of one embodiment of a garment according to aspects of the present invention.

[0036] FIG. 2 is a back elevation view of the garment of FIG. 1.

[0037] FIG. 3 is a side elevation view of the garment of FIG. 1, illustrated with a sleeve raised at the shoulder to reveal a quadrilateral gusset.

[0038] FIG. 4 is a front elevation view of the garment of FIG. 1, only partially assembled and laid flat to reveal inside surfaces.

DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS

(a) Structure of Specific Embodiments

[0039] The structure of the invention will now be illustrated by explanation of specific, non-limiting, exemplary embodiments shown in the drawing figures and described in greater detail herein.

[0040] FIGS. 1-4 show a garment according to a first embodiment of the present invention, generally illustrated at 100.

[0041] The garment 100 has a back panel 102, a front panel 104, a quadrilateral gusset 106 and a sleeve 108.

[0042] A first edge 110 of the quadrilateral gusset 106 forms a first seam 112 with a first edge portion 114 of the front panel 104.

[0043] A second edge 116 of the quadrilateral gusset 106 forms a second seam 118 with a first edge portion 120 of the back panel 102.

[0044] A second edge portion 122 of the front panel 104 forms a third seam 124 with a second edge portion 126 of the back panel 102.

[0045] An end 128 of the sleeve 108 forms a fourth seam 130 with a third edge 132 of the quadrilateral gusset 106 and a fifth seam 134 with a fourth edge 136 of the quadrilateral gusset 106.

[0046] A first edge portion 138 of the sleeve 108 forms a sixth seam 140 with a third edge portion 142 of the front panel 104.

[0047] A second edge portion 144 of the sleeve 108 forms a seventh seam 146 with a third edge portion 148 of the back panel 102.

[0048] A third edge portion 150 of the sleeve 108 forms an eighth seam 152 with a fourth edge portion 154 of the sleeve 108.

[0049] The quadrilateral gusset 106 may be symmetrical about a major axis 156 or a minor axis 158. The quadrilateral gusset 106 may have the shape of a kite, a parallelogram, or a rhombus, for example.

[0050] The sleeve 108 may have a dart 160 at the second edge portion 144.

[0051] The sixth seam 140 may meet the first seam 112 which may meet the third seam 124, sloping from front to back.

[0052] At least one of the back panel 102, the front panel 104, the quadrilateral gusset 106 and the sleeve 108 may

include resilient material, for example a blend of cotton, nylon and spandex, for example a blend of 85% cotton, 10% nylon and 5% spandex.

[0053] In this regard, those skilled in the art will recognize that more broadly and generally, there has been described garment 100 having a body 162 and an appendage 164, and including the quadrilateral gusset 106 to connect the appendage 164 to the body 162. The body 162 may include the back panel 102 and the front panel 104 and the appendage 164 may be the sleeve 108, such that the quadrilateral gusset 106 connects the sleeve 108, the front panel 104 and the back panel 102.

[0054] According to another aspect of the present invention, there is provided a method of making a garment 100 having a body 162 and an appendage 164, by connecting the appendage 164 to the body 162 with a quadrilateral gusset 106. The body 162 may include a back panel 102 and a front panel 104 and the appendage 164 may be a sleeve 108, such that connecting the appendage 164 to the body 162 includes connecting the sleeve 108, the front panel 104 and the back panel 102 with the quadrilateral gusset 106.

(b) Operation of Specific Embodiments

[0055] With reference now to FIGS. 1-4, a method of constructing these specific embodiments of the invention will now be described, and in particular connecting the back panel 102, the front panel 104, the quadrilateral gusset 106 and the sleeve 108 to form the garment 100.

[0056] The method includes cutting material to form the back panel 102, the front panel 104, the quadrilateral gusset 106 and the sleeve 108, for example in shapes and proportions as illustrated in the figures.

[0057] At least one of the back panel 102, the front panel 104, the quadrilateral gusset 106 and the sleeve 108 may include resilient material, for example a blend of cotton, nylon and spandex, for example a blend of 85% cotton, 10% nylon and 5% spandex.

[0058] The back panel 102, the front panel 104, the quadrilateral gusset 106 and the sleeve 108 are then connected together at seams, for example using a four thread serge.

[0059] The first seam 112 is formed between the first edge 110 of the quadrilateral gusset 106 and the first edge portion 114 of the front panel 104.

[0060] The second seam 118 is formed between the second edge 116 of the quadrilateral gusset 106 and the first edge portion 120 of the back panel 102.

[0061] The third seam 124 is formed between the second edge portion 122 of the front panel 104 and the second edge portion 126 of the back panel 102.

[0062] The fourth seam 130 is formed between the end 128 of the sleeve 108 and the third edge 132 of the quadrilateral gusset 106 and the fifth seam 134 is formed between the end 128 of the sleeve 108 and the fourth edge 136 of the quadrilateral gusset 106.

[0063] The sixth seam 140 is formed between the first edge portion 138 of the sleeve 108 and the third edge portion 142 of the front panel 104.

[0064] The seventh seam 146 is formed between the second edge portion 144 of the sleeve 108 and the third edge portion 148 of the back panel 102.

[0065] The eighth seam 152 is formed between the third edge portion 150 of the sleeve 108 and the fourth edge portion 154 of the sleeve 108.

[0066] A dart **160** may be placed in the sleeve **108** at the second edge portion **144**. The assembly may further include aligning the sixth seam **140** to meet the first seam **112** and aligning the first seam **112** to meet the third seam **124**, sloping from front to back.

(c) DESCRIPTION SUMMARY

[0067] Thus, it will be seen from the foregoing embodiments and examples that there has been described a way to attach an appendage to a garment to promote free movement, for example through the use of quadrilateral gusseting, darting and sloping seams.

[0068] While specific embodiments of the invention have been described and illustrated, such embodiments should be considered illustrative of the invention only and not as limiting the invention as construed in accordance with the accompanying claims.

[0069] It will be understood by those skilled in the art that various changes, modifications and substitutions can be made to the foregoing embodiments without departing from the principle and scope of the invention expressed in the claims made herein.

[0070] While the invention has been described as having particular application for garment tops and their sleeves, those skilled in the art will recognize it has wider application, for example for other garments their appendages.

What is claimed is:

1. A garment, comprising:
 - a. a back panel,
 - b. a front panel,
 - c. a quadrilateral gusset, and
 - d. a sleeve,

wherein:

- i. a first edge of the quadrilateral gusset forms a first seam with a first edge portion of the front panel,
 - ii. a second edge of the quadrilateral gusset forms a second seam with a first edge portion of the back panel,
 - iii. a second edge portion of the front panel forms a third seam with a second edge portion of the back panel,
 - iv. an end of the sleeve forms a fourth seam with a third edge of the quadrilateral gusset and a fifth seam with a fourth edge of the quadrilateral gusset,
 - v. a first edge portion of the sleeve forms a sixth seam with a third edge portion of the front panel,
 - vi. a second edge portion of the sleeve forms a seventh seam with a third edge portion of the back panel, and
 - vii. a third edge portion of the sleeve forms an eighth seam with a fourth edge portion of the sleeve.
2. A garment as claimed in claim 1, wherein the quadrilateral gusset is symmetrical about a major axis.
 3. A garment as claimed in claim 1, wherein the quadrilateral gusset is symmetrical about a minor axis.
 4. A garment as claimed in claim 1, wherein the quadrilateral gusset is a kite.
 5. A garment as claimed in claim 1, wherein the quadrilateral gusset is a parallelogram.
 6. A garment as claimed in claim 6, wherein the quadrilateral gusset is a rhombus.

7. A garment as claimed in claim 1, wherein the sleeve has a dart at the second edge portion.

8. A garment as claimed in claim 1, wherein the sixth seam meets the first seam which meets the third seam, sloping from front to back.

9. A garment as claimed in claim 1, wherein at least one of the back panel, the front panel, the quadrilateral gusset and the sleeve includes resilient material.

10. A garment as claimed in claim 9, wherein the resilient material includes a blend of cotton, nylon and spandex.

11. A garment as claimed in claim 10, wherein the blend is 85% cotton, 10% nylon and 5% spandex.

12. A method of making a garment having a back panel, a front panel, a quadrilateral gusset, and a sleeve, comprising:

- i. forming a first seam between a first edge of the quadrilateral gusset and a first edge portion of the front panel,
- ii. forming a second seam between a second edge of the quadrilateral gusset forms a first edge portion the back panel,
- iii. forming a third seam between a second edge portion of the front panel and a second edge portion of the back panel,
- iv. forming a fourth seam between an end of the sleeve and a third edge of the quadrilateral gusset,
- v. forming a fifth seam between the end of the sleeve and a fourth edge of the quadrilateral gusset,
- vi. forming a sixth seam between a first edge portion of the sleeve and a third edge portion of the front panel,
- vii. forming a seventh seam between a second edge portion of the sleeve and a third edge portion of the back panel, and
- viii. forming an eighth seam between a third edge portion of the sleeve and a fourth edge portion of the sleeve.

13. A method as claimed in claim 12, further including placing a dart in the sleeve at the second edge portion.

14. A method as claimed in claim 12, further including aligning the sixth seam to meet the first seam and the first seam to meet the third seam, sloping from front to back.

15. A garment having a body and an appendage, comprising a quadrilateral gusset that connects the appendage to the body.

16. A garment as claimed in claim 15, wherein:

- a. the body includes a back panel and a front panel,
- b. the appendage is a sleeve, and
- c. the quadrilateral gusset connects the sleeve, the front panel and the back panel.

17. A method of making a garment having a body and an appendage, comprising connecting the appendage to the body with a quadrilateral gusset.

18. A method as claimed in claim 17, wherein:

- a. the body includes a back panel and a front panel,
- b. the appendage is a sleeve, and
- c. connecting the appendage to the body includes connecting the sleeve, the front panel and the back panel with the quadrilateral gusset.

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