(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
3 January 2008 (03.01.2008)

PCT

(10) International Publication Number
WO 2008/002432 A2

(51) International Patent Classification:
A41B 1/00 (2006.01) *A41D 1/00* (2006.01)

(21) International Application Number:
PCT/US2007/014349

(22) International Filing Date: 20 June 2007 (20.06.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/816,141 23 June 2006 (23.06.2006) US
11/809,694 1 June 2007 (01.06.2007) US

(71) Applicant *(for all designated States except US)*: **ZUIT-SPORTS, INC.** [US/US]; 2880 Scott St., Ste. 101, Vista, CA 92081 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **FURGERSON, Brandt** [US/US]; 1608 Hilltop Ln., Encinitas, CA 92024 (US). **CHARBONNEAU, Marirose** [US/US]; 2100 Sun Valley Rd., San Marcos, CA 92078 (US).

(74) Agent: **SUDOL, Neil, R.**; Coleman Sudol Sapone, P.C., 714 Colorado Avenue, Bridgeport, CT 06605-1601 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2008/002432 A2

(54) Title: JERSEY AND ASSOCIATED METHOD OF MANUFACTURE

(57) Abstract: A jersey or shirt is made of plural fabric panels or. sections including at least one lower back panel, at least one chest panel and two shoulder panels. The shoulder panels are connected on the back side of the torso to the lower back panel along a substantially horizontal seam and are joined to one another on the back side of the torso along a vertical seam substantially coincident with a longitudinal or vertical axis of the back side of the torso. Each of the shoulder panels extends across half of an upper portion of the back side of the torso and over a shoulder portion of a respective one of the sleeves and is connected along an anterior side of the torso to the at least one chest panel. The shoulder panels are cut on the bias.

JERSEY AND ASSOCIATED METHOD OF MANUFACTURE

BACKGROUND OF THE INVENTION

This invention relates to a shirt or jersey, particularly of the sort worn in sports activities such as cycling. This invention also relates to a method of manufacturing such a shirt or jersey.

Conventional cycling jerseys patterns, either raglan or set-in, do not fit well when the user is in the aero position, that is, torso bent forward with arms down and forward. In this position the conventional jersey has limited stretch and this exerts restrictive forces on the wearer. Disadvantages include discomfort and possibly a needless increase in air resistance or drag.

SUMMARY OF THE INVENTION

The present invention aims to provide a jersey which has a better fit in the aero position, resulting in greater comfort and reduced air resistance or drag. The present invention also aims to provide a method of manufacturing such a shirt or jersey.

A jersey or shirt comprises, in accordance with the present invention, a plurality of fabric panels or sections attached to one another to form a tubular torso and a pair of tubular sleeves, the torso having a neck opening at one end and a waist opening at an opposite end, the sleeves having free ends provided with respective arm openings. The fabric panels or sections include at least one lower back panel, at least one chest panel and two shoulder panels. The torso has a longitudinal axis extending from the neck opening to the waist opening along a back side of the torso. The shoulder panels are connected on the back side of the torso to the at least one lower back panel along a substantially horizontal seam oriented substantially transversely to the longitudinal axis. The shoulder panels are joined to one another on the back side of the torso along a vertical seam substantially coincident with the longitudinal axis. The vertical seam is preferably contiguous at a lower end with the horizontal seam. Each of the shoulder panels extends across half of an upper portion of the back side of the torso and over a shoulder portion of a respective one of the sleeves and is connected along an anterior side of the torso to the at least one chest panel.

The shoulder panels may be connected to the chest panel along substantially horizontal first and second anterior seam segments. The anterior seam segments are located preferably no higher than approximately clavicle

areas of the torso.

The fabric panels or sections may further include at least two lateral torso panels each connected along an arcuate seam to a respective one of the shoulder panels along the back side of the torso.

The lower back panel may be a unitary or continuous panel extending across the back side of the torso. Similarly, the chest panel may be a unitary panel extending across the anterior side of the torso from one sleeve to the opposite sleeve.

The fabric panels or sections may further include sleeve end panels connected along seams to edges of the shoulder panels at free ends of the sleeves.

Preferably, the shoulder panels are made of a knitted fabric cut on the bias. The shoulder panels are cut and sewn into the jersey so that the shoulder panels have a maximum degree of stretchability in a direction extending from the vertical seam over the respective shoulders, along the back side of the torso in a direction oriented at approximately 45 degrees relative to the vertical seam.

The shoulder panels are each a single or seamless fabric section extending from the vertical seam and the horizontal seam on the back side of the torso over the shoulders and to the chest panel.

A method for making a jersey or shirt comprises, in accordance with the present invention, cutting a plurality of fabric panels or sections, the fabric panels or sections including at least one lower back panel, at least one chest panel and two shoulder panels, and attaching the fabric panels or sections to one another to form a tubular torso and a pair of tubular sleeves so that the torso has a neck opening at one end and a waist opening at an opposite end and so that the sleeves have free ends provided with respective arm openings. The torso has a longitudinal axis extending from the neck opening to the waist opening along a back side of the torso. The attaching of the fabric panels or sections to one another includes connecting the shoulder panels on the back side of the torso to the at least one lower back panel along a substantially horizontal seam oriented substantially transversely to the longitudinal axis. The attaching of the fabric panels or sections to one another further includes joining the shoulder panels to one another on the back side of the torso along a vertical seam substantially coincident with the longitudinal axis. The attaching of the fabric panels or

sections to one another also includes arranging each of the shoulder panels to extend across half of an upper portion of the back side of the torso and over a shoulder portion of a respective one of the sleeves and connecting the shoulder panels along an anterior side of the torso to the at least one chest panel.

The attaching of the fabric panels or sections to one another includes connecting the shoulder panels to the chest panel along substantially horizontal first and second anterior seam segments. The anterior seam segments are located preferably no higher than approximately clavicle areas of the torso.

The fabric panels or sections may further include at least two lateral torso panels, the attaching of the fabric panels or sections to one another including joining each of the lateral torso panels along an arcuate seam to a respective one of the shoulder panels along the back side of the torso.

The lower back panel may be a single or unitary panel extending across the back side of the torso. Similarly, the chest panel may a single or unitary panel extending across the anterior side of the torso from one sleeve to the opposite sleeve.

Where the fabric panels or sections further include sleeve end panels, the attaching of the fabric panels or sections to one another includes joining the sleeve end panels along seams to edges of the shoulder panels at free ends of the sleeves.

Where the shoulder panels are made of a knitted fabric material, the cutting of the fabric panels or sections preferably includes cutting the shoulder panels on the bias. The shoulder panels are cut and attached so as to have a maximum degree of stretchability in a direction extending from the vertical seam over the respective shoulders, along the back side of the torso in a direction oriented at approximately 45 degrees relative to the vertical seam.

The shoulder panels are each cut as a single or seamless fabric section and attached to other fabric panels or sections to extend from the vertical seam and the horizontal seam on the back side of the torso over the shoulders and to the chest panel.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a rear elevational view of a cycling jersey in accordance with the present invention.

FIG. 2 is a front elevational view of the jersey of FIG. 1.

DETAILED DESCRIPTION

A jersey or shirt 10 is assembled from a plurality of fabric panels or sections 12 attached to one another to form a tubular torso 14 and a pair of tubular sleeves 16 and 18. Torso 14 has a neck opening 20 at one end defined by a collar 21 and a waist opening 22 at an opposite end defined by a waist band 23, while sleeves 16 and 18 have free ends provided with respective arm openings 24 and 26. Fabric panels or sections 12 include a first lower back panel 28, a second lower back panel 30, at least one chest panel 32 (FIG. 2) and two shoulder panels 34 and 36. Back panel 30 is located below back panel 28.

Torso 14 has a longitudinal axis 38 extending from neck opening 20 or collar 21 to waist opening 22 along a back side of torso 14. Shoulder panels 34 and 36 are connected on the back side of torso 14 to lower back panel 28 along a substantially horizontal seam 40 oriented substantially transversely to longitudinal axis 38. Shoulder panels 34 and 36 are joined to one another on the back side of torso 14 along a vertical seam 42 substantially coincident with longitudinal axis 38. Vertical seam 42 is preferably contiguous at a lower end with horizontal seam 40. Each shoulder panel 34 and 36 extends from vertical seam 42 across half of torso 14 and over a shoulder portion 46 and 48 of a respective one of the sleeves 16 and 18. Shoulder panels 34 and 36 are connected along an anterior side of torso 14 (FIG. 2) to chest panel 32. In the illustrated embodiment, chest panel 32 extends continuously downwardly to waist band 23.

Shoulder panels 34 and 36 are connected to chest 32 panel along substantially horizontal first and second anterior seam segments 50 and 52. Segments 50 and 52 are located just below clavicle areas (not separately designated) of torso 14. Horizontal seam 40 is located below the region of the scapulas (not designated).

Fabric panels or sections 12 further include two first lateral torso panels 54 and 56 each connected along an arcuate seam 58 and 60 to a respective shoulder panel 34 and 36 along the back side of torso 14 (FIG. 1). Lateral,torso panels 54 and 56 extend from the posterior of the torso 14, under sleeves 16 and 18 and down the anterior of the jersey 10, as shown in Fig. 2. Second lateral torso panels 62 and 64 are located between lateral torso panels 54

and 56, on the one hand, and back panels 28 and 30, on the other hand.

Each lower back panel 28 and 30 is a unitary or continuous panel extending across the back side of torso 14 from one secondary lateral panel 62 to the other 64. Similarly, chest panel 32 is a unitary panel extending across the anterior side of the torso from one sleeve 16 to the opposite sleeve 18.

Fabric panels or sections 12 further include sleeve end panels 66 and 68 connected along seams 70 and 72 to edges of shoulder panels 34 and 36 at free ends of sleeves 16 and 18.

Shoulder panels 34 and 36 are made of a knitted fabric cut on the bias or axis. Panels 34 and 36 are cut and sewn into the jersey 10 so that they have a maximum degree of stretchability in a direction 74 and 76 extending from vertical seam 42 over the respective shoulder portions 46 and 48, along the back side of the torso, at angles Al and A2 oriented at approximately 45 degrees relative to vertical seam 42. Shoulder panels 34 and 36 are each a single or seamless fabric section extending from vertical seam 42 and horizontal seam 40 over shoulder portions 46 and 48 and to the chest panel.

A method for making jersey or shirt 10 includes cutting fabric panels or sections 12, attaching the fabric panels or sections to one another to form torso 14 and sleeves 16 and 18 so that the torso has neck opening 20 at one end and waist opening 22 at an opposite end and so that sleeves 16 and 18 have arm openings 24 and 26. The attaching of fabric panels or sections 12 to each other includes connecting shoulder panels 34 and 36 to back panel 28 along horizontal seam 40 and joining the shoulder panels to one another along vertical seam 42. The attaching of fabric panels or sections 12 to one another also includes arranging shoulder panels 34 and 36 so that each extends across half of an upper portion of the back side of torso 14 and over a respective shoulder portion 46 and 48 and connecting the shoulder panels to chest panel 32 along seam segments 50 and 52.

Shoulder panels 34 and 36 are made of a knitted fabric material, and the cutting of the fabric panels or sections 12 includes cutting the shoulder panels on the bias. Shoulder panels 34 and 36 are cut and attached so as to have a maximum degree of stretchability in directions 74 and 76. Shoulder panels 34 and 36 are each cut as a single or seamless fabric section and attached to other fabric panels or sections to extend from vertical seam 42 and horizontal seam

40 over shoulder portions 46 and 48 to the chest panel 32.

The attaching of fabric panels or sections 12 to one another further includes connecting shoulder panels 34 and 36 to chest panel 32 along seam segments 50 and 52 and joining lateral torso panels 54 and 56 along seams 58 and 60 to shoulder panels 34 and 36, respectively.

Attaching of the various fabric panels or sections 12 to each other is accomplished through needle work or stitching. Any suitable stitching can be used. One such stitching is a modified 2-needle over-lock stitch that is a variation of a standard 3-thread operation, but uses only 1 needle thread and a bottom looper thread. In this modified stitch, the upper looper is replaced with a special "hook" looper (looks a bit like a thick, bent seam ripper) and receives no thread; the needle tension is loosened almost completely and the looper thread tension stays as per normal setting. The width of the overlock finger on the plate combined with the needle tension is what determines the finished width of the seamlink. A smaller finger will always produce a smaller finished seam, while a standard finger will produce the desired seam width, both are adjustable to a degree by the needle thread tension. The tighter the tension is, the narrower the finished width will be and the bulkier the underside of the seam will be. When the needle tension is almost nill, the result is a flattest, widest finish. The density of the stitch depends on the stitch length and needs to be experimented with on each fabric to determine an appropriate density.

This modified 2-needle over-lock stitch requires a 2 step process, namely, (1) the sewing operation as described above, and (2) pulling the stitch perpendicular to the seam direction manually and before any congruent seams are constructed.

As illustrated in FIG. 2, lower back panel 30 may be provided with a cover sheet 78 stitched to back panel 30 along plural seams 80 to form a plurality of vertical pockets 82.

CLAIMS:

1. A jersey or shirt comprising: a plurality of fabric panels or sections attached to one another to form a tubular torso and a pair of tubular sleeves, said torso having a neck opening at one end and a waist opening at an opposite end, said sleeves having free ends provided with respective arm openings, said fabric panels or sections including at least one lower back panel, at least one chest panel and two shoulder panels, said torso having a longitudinal axis extending from said neck opening to said waist opening along a back side of said torso, said shoulder panels being connected on said back side of said torso to said at least one lower back panel along a substantially horizontal seam oriented substantially transversely to said longitudinal axis, said shoulder panels being joined to one another on said back side of said torso along a vertical seam substantially coincident with said longitudinal axis, each of said shoulder panels extending across half of an upper portion of said back side of said torso and over a shoulder portion of a respective one of said sleeves and being connected along an anterior side of said torso to said at least one chest panel.

2. The jersey or shirt defined in claim 1 wherein said shoulder panels are connected to said chest panel along substantially horizontal first and second anterior seam segments.

3. The jersey or shirt defined in claim 2 wherein said anterior seam segments are located no higher than approximately clavicle areas of said torso.

4. The jersey or shirt defined in claim 1 wherein said fabric panels or sections further include at least two lateral torso panels each connected along an arcuate seam to a respective one of said shoulder panels along said back side of said torso.

5. The jersey or shirt defined in claim 4 wherein said lower back panel is a unitary panel extending across said back side of said torso.

6. The jersey or shirt defined in claim I wherein said chest panel is a singl panel extending across said anterior side of said torso from one sleeve to the opposit sleeve.

7. The jersey or shirt defined in claim I wherein said fabric panels or sections further include sleeve end panels connected along seams to edges of said shoulder panels at free ends of said sleeves.

8. The jersey or shirt defined in claim 1 wherein said shoulder panels are made of a knitted fabric cut on the bias.

9. The jersey or shirt defined in claim 1 wherein said shoulder panels have a maximum degree of stretchability in a direction extending from said vertical seam over the respective shoulders.

10. The jersey or shirt defined in claim 1 wherein said shoulder panels have a maximum degree of stretchability along said back side of said torso in a direction oriented at approximately 45 degrees relative to said vertical seam.

11. The jersey or shirt defined in claim 1 wherein said shoulder panels are each a single or seamless fabric section extending from said vertical seam and said horizontal seam on said back side of said torso over the shoulders and to said chest panel.

12. The jersey or shirt defined in claim I wherein said vertical seam is contiguous at a lower end with said horizontal seam.

13. A method for making a jersey or shirt comprising:

cutting a plurality of fabric panels or sections, said fabric panels or sections including at least one lower back panel, at least one chest panel and two shoulder panels; and

attaching said fabric panels or sections to one another to form a tubular torso

and a pair of tubular sleeves so that said torso has a neck opening at one end and a wais opening at an opposite end and so that said sleeves have free ends provided with respective arm openings, said torso having a longitudinal axis extending from said neck opening to said waist opening along a back side of said torso,

the attaching of said fabric panels or sections to one another including connecting said shoulder panels on said back side of said torso to said at least one lower back panel along a substantially horizontal seam oriented substantially transversely to said longitudinal axis,

the attaching of said fabric panels or sections to one another further including joining said shoulder panels to one another on said back side of said torso along a vertical seam substantially coincident with said longitudinal axis,

the attaching of said fabric panels or sections to one another also including arranging each of said shoulder panels to extend across half of an upper portion of sai back side of said torso and over a shoulder portion of a respective one of said sleeves and connecting said shoulder panels along an anterior side of said torso to said at leas one chest panel.

14. The method defined in claim 13 wherein the attaching of said fabric panels or sections to one another includes connecting said shoulder panels to said chest panel along substantially horizontal first and second anterior seam segments.

15. The method defined in claim 13 wherein said anterior seam segments are located no higher than approximately clavicle areas of said torso.

16. The method defined in claim 13 wherein said fabric panels or sections further include at least two lateral torso panels, the attaching of said fabric panels or sections to one another including joining each of said lateral torso panels along an arcuate seam to a respective one of said shoulder panels along said back side of said torso.

17. The method defined in claim 16 wherein said lower back panel is a

single or unitary panel extending across said back side of said torso.

18. The method defined in claim 13 wherein said chest panel is a single or unitary panel extending across said anterior side of said torso from one sleeve to the opposite sleeve.

19. The method defined in claim 13 wherein said fabric panels or sections further include sleeve end panels, the attaching of said fabric panels or sections to one another including joining said sleeve end panels along seams to edges of said shoulder panels at free ends of said sleeves.

20. The method defined in claim 13 wherein said shoulder panels are made of a knitted fabric material, the cutting of said fabric panels or sections including cutting said shoulder panels on the bias.

21. The method defined in claim 13 wherein said shoulder panels are cut and attached so as to have a maximum degree of stretchability in a direction extending from said vertical seam over the respective shoulders.

22. The method defined in claim 13 wherein said shoulder panels are cut and attached so as to have a maximum degree of stretchability along said back side of said torso in a direction oriented at approximately 45 degrees relative to said vertical seam.

23. The method defined in claim 13 wherein said shoulder panels are each cut as a single or seamless fabric section and attached to other fabric panels or sections to extend from said vertical seam and said horizontal seam on said back side of said torso over the shoulders and to said chest panel.

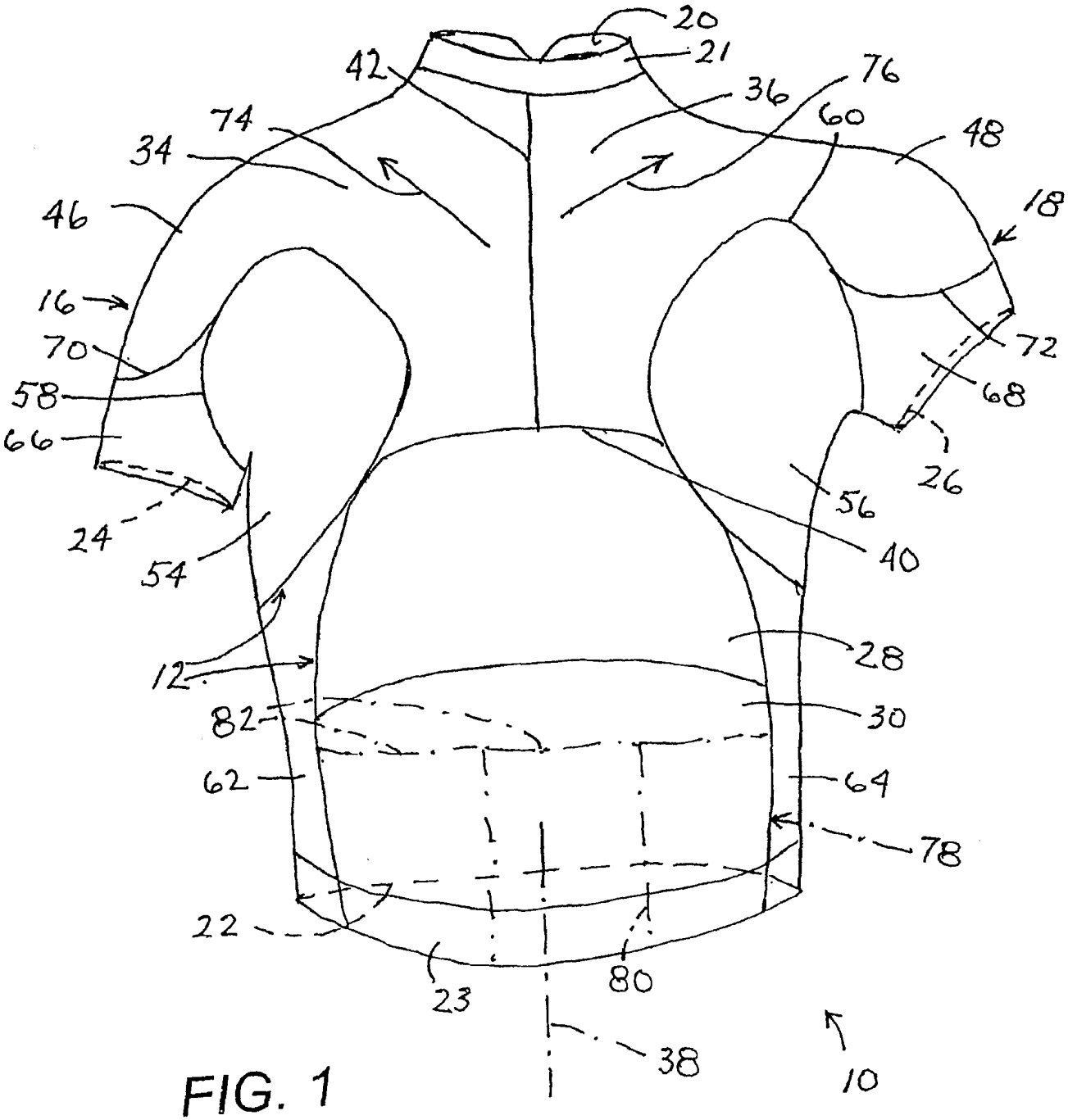

20
21
42
36
76
74
60
48
34
18
46
16
70
72
58
68
66
26
24
56
54
40
12
28
82
30
62
64
78
22
23
80
38
10

FIG. 1

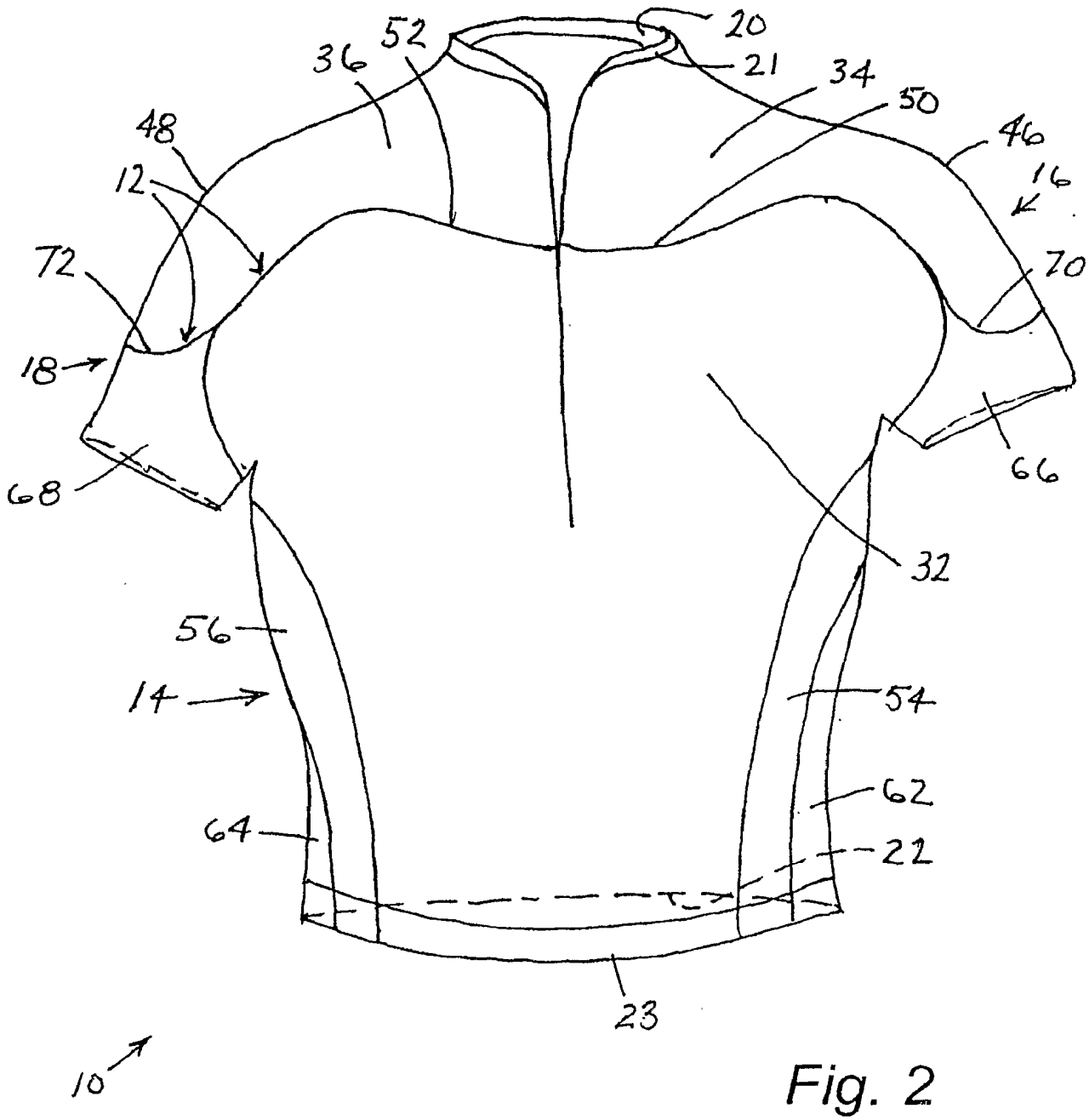


Fig. 2