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(54) **CYCLING SHORTS AND ASSOCIATED METHOD OF MANUFACTURE**

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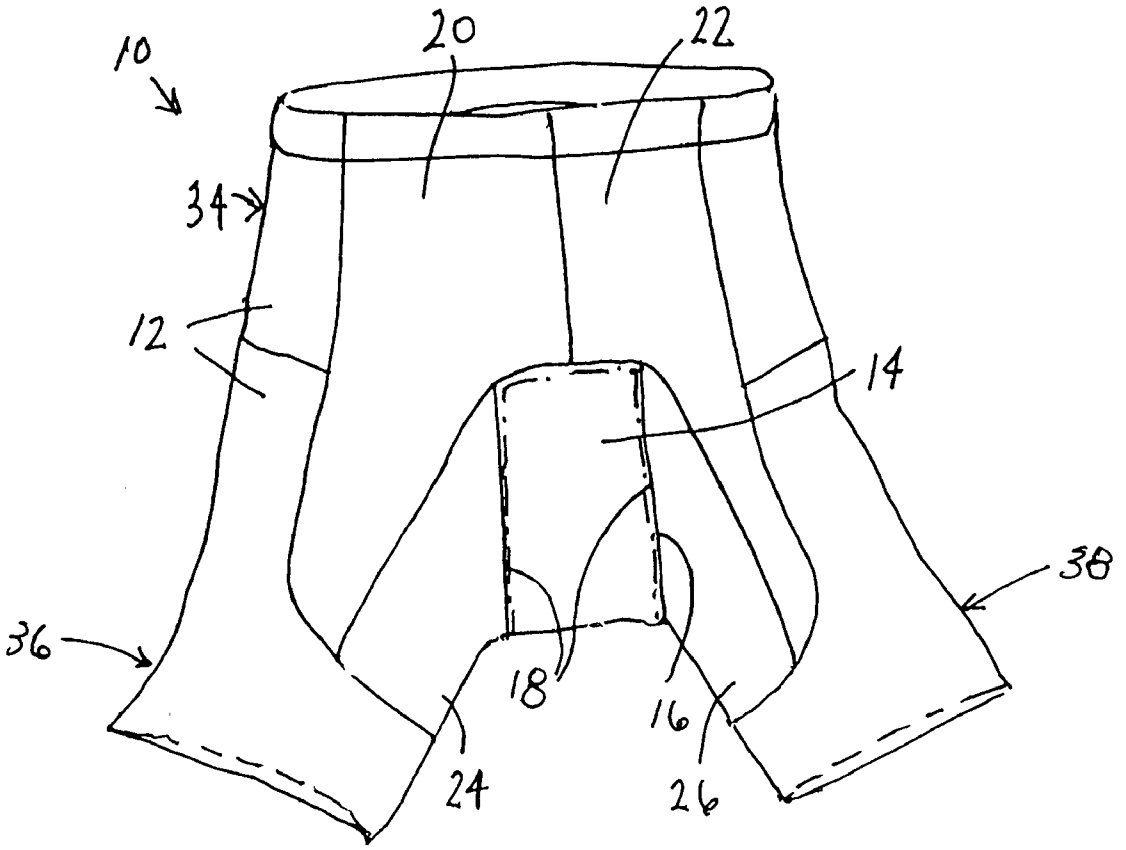
(57) **ABSTRACT**

Cycling shorts are constructed from a plurality of panels of stretchable fabric material and a crotch pad of absorbent material. The fabric material has a first thickness, while the pad material has a second thickness substantially greater than the first thickness. The pad has a plurality of edges joined to edges of selected ones of the panels disposed adjacent to and contiguous with the pad.



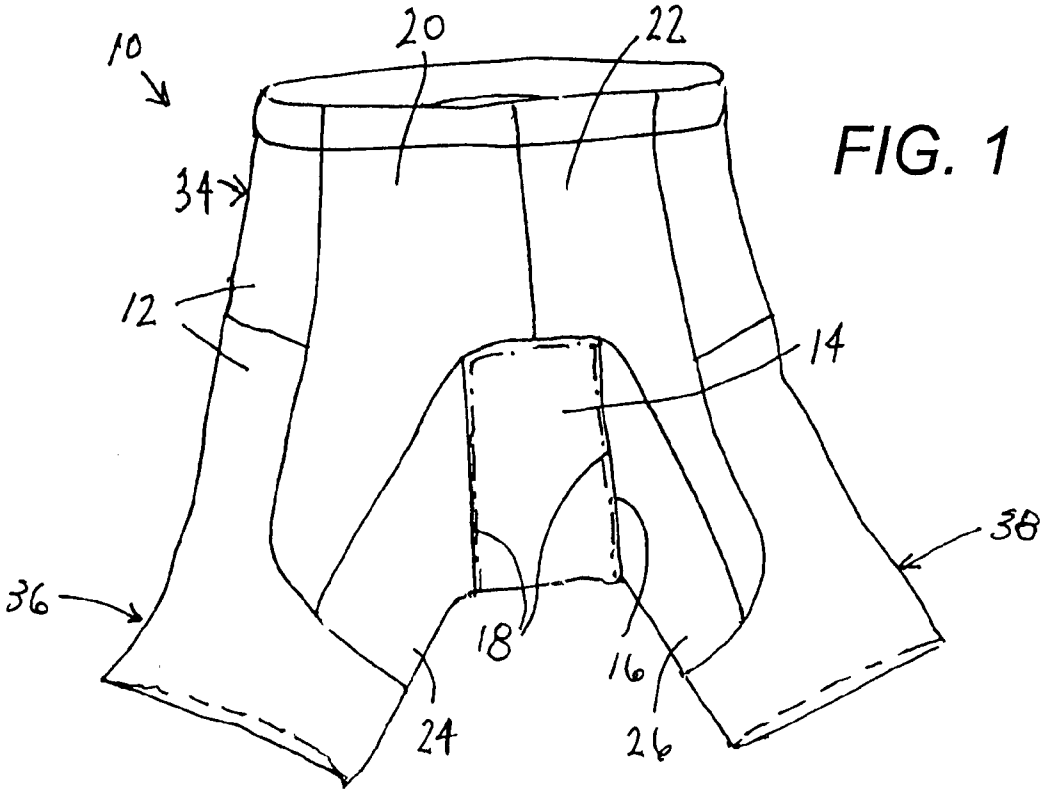

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FIG. 1

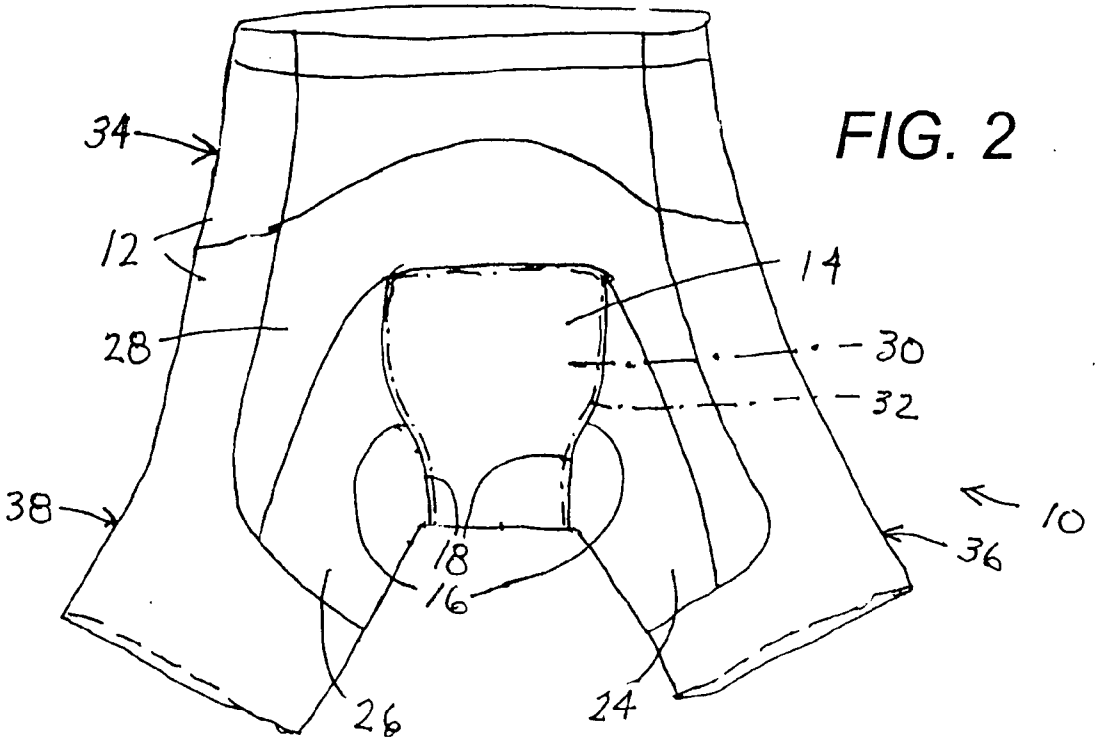
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FIG. 2

CYCLING SHORTS AND ASSOCIATED METHOD OF MANUFACTURE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 60/816,098 filed Jun. 23, 2006.

BACKGROUND OF THE INVENTION

[0002] This invention relates to an article of clothing, specifically cycling shorts. This invention also relates to an associated method of manufacture.

[0003] Shorts for the serious bicycle rider are typically made of a knitted synthetic resin material with substantial stretchability in multiple direction enable a tight fit to the wearer's anatomy. For purposes of cushioning and enhanced moisture absorption, a pad of nonwoven absorbent material is provided inside the shorts in the crotch region thereof. The crotch pad places certain constraints on the adaptability of the shorts to different positions and motions of the user.

SUMMARY OF THE INVENTION

[0004] The present invention aims to provide a new kind of cycling shorts wherein the crotch pad is better integrated into the shorts structure. The present invention concomitantly aims to provide an associated method for manufacturing a pair of cycling shorts.

[0005] Cycling shorts in accordance with the present invention comprise a plurality of panels of stretchable fabric material and a crotch pad of absorbent material. The fabric material has a first thickness, while the pad material has a second thickness substantially greater than the first thickness. The pad has a plurality of edges joined to edges of selected ones of the panels disposed adjacent to and contiguous with the pad.

[0006] Typically, the fabric panels are made of the same type of material and have a common thickness and a common weight. The pad may have a thickness that varies across the pad but the pad has a minimum thickness that is larger than the common or uniform thickness of the fabric panels.

[0007] The fabric panels are typically cut from a knitted polymeric material such as nylon.

[0008] Pursuant to another feature of the present invention, the pad is connected to the panels only at edges thereof. This arrangement contrasts with the construction of conventional cycling shorts, where the edges of the crotch pad are sewn along central areas of the pre-existing shorts.

[0009] In a particular embodiment of the present invention, the fabric panels include a crotch panel identical in size and shape to the pad and extending coextensively therewith. In this embodiment the crotch panel and the crotch pad overlap one another completely, the edges of the crotch panel and the edges of the pad being laterally adjacent, in a direction perpendicular to the plane of the pad, and connected to one another. The edges of the pad abut the edges of the other panels and are adjacent thereto in a direction parallel or tangential to the pad.

[0010] Preferably, the pad is joined to the selected or adjacent panels by stitches or sewn thread.

[0011] In another embodiment of the cycling shorts, the pad serves as a panel of the cycling shorts and may thus be visible from the outside, instead of covered or masked by a fabric panel.

[0012] A method for making cycling shorts comprises, in accordance with the present invention, cutting a plurality of panels from stretchable fabric material (generally knitted), providing a crotch pad of absorbent material, joining the panels to each other and to the crotch pad only at edges of the panels and the crotch pad to thereby form a tubular body portion and two tubular leg portions.

[0013] The joining of the panels to each another and to the crotch pad may include sewing or stitching the panels to each another and to the crotch pad.

[0014] Where one of the panels is geometrically congruent with the crotch pad, the method further comprises aligning the one panel with the crotch pad so that the one panel and the crotch pad are coextensive and completely overlap one another. The joining of the panels to each another and to the crotch pad includes sewing or stitching edges of the one panel to corresponding laterally adjacent edges of the crotch pad.

[0015] In the manufacture of conventional cycling shorts, a complete shorts structure is first made and subsequently the crotch pad is overlaid and stitched to the pre-existing shorts. In contrast, the present invention contemplates that a complete shorts structure comes into being only with the crotch pad already integrated therein. Without the crotch pad there would be a hole in the crotch area of the shorts. This is the case even where there is a crotch panel coextensive with the pad. The crotch panel is joined to the other panels at the same time that the pad is sewn in place, not before.

[0016] The crotch pad in cycling shorts in accordance with the present invention is a padded gusset that is preferably sewn to adjacent fabric panels via a seam link stitch, a modified 2-needle over-lock stitch.

[0017] Cycling shorts constructed in accordance with the present invention incorporate a dynamic pad system, providing enhanced flexibility, better fit and improved moisture wicking.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. **1** is a front elevational view of a pair of cycling shorts in accordance with the present invention.

[0019] FIG. **2** is a rear elevational view of the cycling shorts of FIG. **1**.

DETAILED DESCRIPTION

[0020] Cycling shorts **10** comprises a plurality of panels or sections **12** of stretchable fabric material and a crotch pad **14** of absorbent material. Panels or sections **12** are made of the same type of material and have a common thickness and a common weight. Fabric panels or sections **12** are cut from a knitted polymeric material such as nylon.

[0021] The fabric material of panels **12** has a uniform or common thickness substantially thinner than the thickness of pad **14** at any point. Pad **14** may have more than one thickness, for instance, where the pad is terraced along an inner surface. In other words, pad **14** may have a thickness that varies across the pad but the pad has a minimum thickness that is larger than the common or uniform thickness of the fabric panels **12**.

[0022] Pad **14** has a plurality of edges **16** joined to contiguous edges **18** of adjacent fabric panels including two central front panels **20** and **22**, two flanking inner leg panels **24** and **26** and a lower rear panel **28**.

[0023] Pad **14** is connected to panels or fabric sections **12** only at edges **18** thereof. Thus, pad **14** does not overlap any fabric panel or section **12** (e.g., panels **20**, **22**, **24**, **26**, **28**), with the exception of an optional covering sheet or crotch panel **30**.

[0024] Crotch panel **30**, if provided, is identical in size and shape (congruent) to crotch pad **14** and is coextensive therewith. Crotch panel **30**, if provided, overlaps completely with crotch pad **14**, with the edges **32** of the crotch panel and the edges **16** of the pad being laterally adjacent, in a direction perpendicular to the plane of the pad **14**, and connected to one another by appropriate stitching. The edges **16** of pad **14** abut the edges **18** of the other panels **12** and are adjacent thereto in a direction parallel or tangential to the pad.

[0025] Pad **14** is joined to front panels **20** and **22**, inner leg panels **24** and **26** and lower rear panel **28** by stitches or sewn thread. The stitching may be a modified **2**-needle over-lock stitch that is a variation of a standard **3**-thread operation, but uses only I 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.

[0026] 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.

[0027] Where crotch panel **30** is omitted, pad **14** serves as a panel of the cycling shorts **10** and may thus be visible from the outside, instead of covered or masked by fabric panel **30**.

[0028] In a method for making cycling shorts **10**, one cuts fabric panels or sections **12** from stretchable knitted material and joins the panels to each other and to crotch pad **14** only at edges **18** of the panels and the edges **16** of crotch pad **14** to thereby form a tubular body portion **34** and two tubular leg portions **36** and **38**.

[0029] The joining of fabric panels **12** to each another and to crotch pad **14** is accomplished by sewing or stitching the panels to each another and to the crotch pad. Where one of the panels (**30**) is geometrically congruent with crotch pad **14**, the method further comprises aligning crotch panel **30** with crotch pad **14** so that the crotch panel and the crotch pad are coextensive and completely overlap one another. The joining of the panels **12** to each another and to crotch pad **14** includes sewing or stitching edges **32** of crotch panel **30** to corresponding laterally adjacent edges **16** of crotch pad **14**.

[0030] Although the invention has been described in terms of particular embodiments and applications, one of ordinary skill in the art, in light of this teaching, can generate additional embodiments and modifications without departing from the spirit of or exceeding the scope of the claimed invention. For instance, where there is a fabric crotch panel that is coextensive with and covers the crotch pad, the crotch panel may be connected first to the other fabric panels, prior to the joining of the pad. This method requires double stitching or dual and overlapping seams along the edges of the pad and the crotch panel. In any case, the pad is connected to the fabric panels only at the edges of the panels. Accordingly, it is to be understood that the drawings and descriptions herein are proffered by way of example to facilitate comprehension of the invention and should not be construed to limit the scope thereof.

What is claimed is:

1. Cycling shorts comprising a plurality of panels of stretchable fabric material and a crotch pad of absorbent material, said fabric material having a first thickness, said pad material having a minimum second thickness substantially greater than said first thickness, said pad having a plurality of edges joined to edges of selected ones of said panels disposed adjacent to and contiguous with said pad.

2. Cycling shorts as set forth in claim **1** wherein said pad is connected to said panels only at edges thereof.

3. Cycling shorts as set forth in claim **2** wherein said panels include a crotch panel identical in size and shape to said pad and extending coextensively therewith.

4. Cycling shorts as set forth in claim **1** wherein said panels include a crotch panel identical in size and shape to said pad and extending coextensively therewith.

5. Cycling shorts as set forth in claim **1** wherein said pad is joined to said selected ones of said panels by stitches or sewn thread.

6. Cycling shorts as set forth in claim **1** wherein said pad serves as a panel of the cycling shorts.

7. A method for making cycling shorts, comprising:

cutting a plurality of panels from stretchable fabric material;

providing a crotch pad of absorbant material; and

joining said panels to each other and to said crotch pad only at edges of said panels and said crotch pad to thereby from a tubular body portion and two tubular leg portions.

8. The method set forth in claim **7** wherein the joining of said panels to each another and to said crotch pad includes sewing or stitching said panels to each another and to said crotch pad.

9. The method set forth in claim **7** wherein one of said panels is geometrically congruent with said crotch pad, further comprising aligning said one of said panels with said crotch pad so that said one of said panels and said crotch pad are coextensive and completely overlap one another, the joining of said panels to each another and to said crotch pad including sewing or stitching edges of said one of said panels to corresponding laterally adjacent edges of said crotch panels.

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