



(51) International Patent Classification:

A41D 1/08 (2006.01) A41D 13/00 (2006.01)
A41B 9/02 (2006.01) A41D 27/12 (2006.01)

(21) International Application Number:

PCT/CA2010/001829

(22) International Filing Date:

22 November 2010 (22.11.2010)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/264,278 25 November 2009 (25.11.2009) US
61/351,352 4 June 2010 (04.06.2010) US

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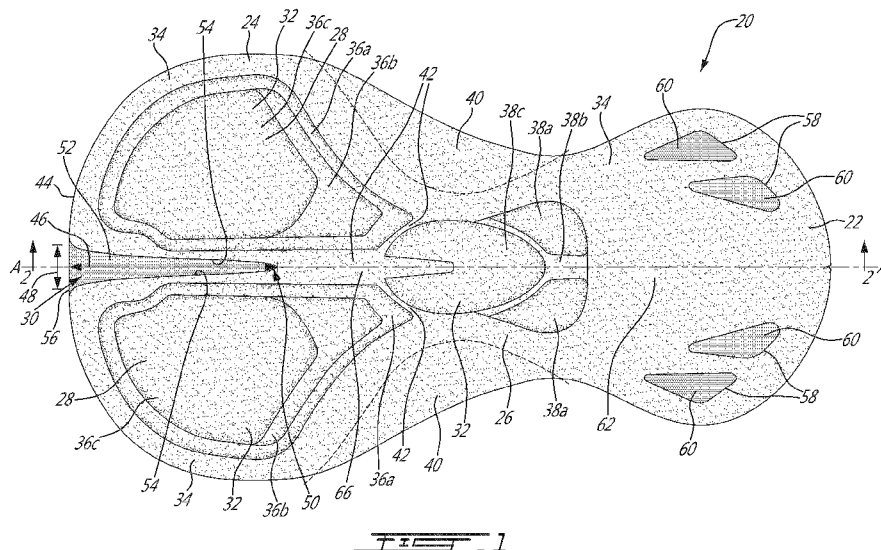
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: SEAT PAD FOR CYCLING GARMENT



(57) Abstract: A seat pad for a cycling garment includes a rear portion oriented to align with a buttocks region of a cyclist and an intermediate portion oriented to align with a perineum region of the cyclist, the rear portion being separated into two seat surfaces including a padded area and having an elongated groove extending from one of a front end or a rear end of the seat pad towards the intermediate portion, the elongated groove having a length longer than a width at the respective one of the front end and the rear end of the seat pad. It also relates to a cycling garment including the seat pad.

SEAT PAD FOR CYCLING GARMENT

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority under 35USC§119(e) of US provisional patent applications 61/264278 filed November 25, 2009 and 61/351352 filed June 4, 2010, the specifications of which are hereby incorporated by reference.

Field of the Invention

[0002] The technical field relates to a seat pad for a pair of cycling pants and, more particularly, to a flexible seat pad for fitting onto the buttock, the lower abdominal, and perineum regions of a cyclist or any person wearing the seat pad.

Description of the Prior Art

[0003] Increased popularity of cycling, at both recreational and competitive levels, has resulted in a demand for high quality, low cost cycling apparels which are effective at providing the user with bodily comfort during sustained periods of cycling.

[0004] Particularly, considerable attempts have been made at developing cyclist pants which provide the cyclist with increased comfort during contact of the body with the cycle seat. Typically, during cycling, a substantial portion of the cyclist's body weight bears on the cycle seat. Additionally, when peddling, the cyclist's body undergoes considerable movement relative to the cycle seat resulting in frictional contact therebetween. Such weight bearing and prolonged frictional contact are known to cause certain discomforts including minor abrasions and, in some instances, more serious injuries suffered at the lower abdominal region of the cyclist.

[0005] Existing cyclist pants include multi-layered seat pads affixed to the inside crotch area of the pants. Such seat pads are designed to increase comfort by providing a padded buffer between the cyclist and the cycle seat during use. However, such known seat pads are often bulky and result in the unintended consequence of adding to the cyclist's discomfort upon the cycle seat. For instance, such seat pads are known to be less flexible than desired, thus increasing discomfort of the cyclist.

[0006] There is thus a need for a seat pad which combines both properties, i.e. cushioning where needed and sufficient flexibility.

SUMMARY OF THE INVENTION

[0007] It is an aspect of the invention to improve comfort of cyclists wearing cycling garments with seat pads.

[0008] It is therefore an aim of the present invention to address the above mentioned issues and to provide a seat pad and a cycling garment including the same which provide effective padding against contact with the cycle seat with an increased flexibility.

[0009] According to a general aspect, there is provided a seat pad for a cycling garment comprising: a front portion, an opposing rear portion, and an intermediate portion disposed between the front and rear portions, the rear portion having an elongated groove extending between two seat surfaces having padded areas from a rear end of the seat towards the intermediate portion, the elongated groove extending to a tip corresponding substantially to a coccyx tip of a cyclist wearing the cycling garment.

[0010] According to another general aspect, there is provided a seat pad for a cycling garment comprising a rear portion oriented to align with a buttocks region of a cyclist and an intermediate portion oriented to align with a perineum region of the cyclist, the rear portion being separated into two seat surfaces including a padded area and having an elongated groove extending between the seat surfaces from a rear end of the seat pad towards the intermediate portion, the elongated groove having a length longer than a width at the rear end of the seat pad.

[0011] According to another general aspect, there is provided a cycling garment comprising a seat pad having a rear portion oriented to align with a buttocks region of a cyclist and an intermediate portion oriented to align with a perineum region of the cyclist, the rear portion being separated into two seat surfaces including a padded area and having an elongated groove extending between the seat surfaces from a rear end of the seat pad towards the intermediate portion, a tip of the

elongated groove extending substantially to a beginning of a rear end of a bicycle seat when a cyclist wearing the cycling garment is seated on the bicycle seat.

[0012] According to still another general aspect, there is provided a seat pad for a cycling garment comprising: a front portion, an opposing rear portion, and an intermediate portion disposed between the front and rear portions, the front portion having an elongated front groove extending from a peripheral edge of the seat pad towards the intermediate portion.

[0013] According to still another general aspect, there is provided a cycling garment comprising a seat pad with a front portion, an opposing rear portion, and an intermediate portion disposed between the front and rear portions, the rear portion having an elongated groove extending between two seat surfaces having padded areas, the elongated groove extending from a rear end of the seat pad towards the intermediate portion, the elongated groove having a tip which at least one of corresponds substantially to a coccyx tip of the cyclist wearing the cycling garment, is located forwardly of the coccyx tip of the cyclist wearing the cycling garment, and extends past a middle point of the seat surfaces along a longitudinal axis of the seat pad and towards the intermediate portion.

[0014] In an embodiment, the elongated groove extends along the longitudinal axis of the seat pad and has a length along the longitudinal axis longer than a width along a peripheral edge of the seat pad. The length of the elongated groove can range between seven and thirteen centimeters (7-13 cm) and the width of the elongated groove at the rear end of the seat pad ranges between 0.5 and five centimeters (0.5-5 cm). The elongated groove can be V-shaped and can define an angle ranging between five and thirty degrees (5-30 °).

[0015] In an embodiment, the seat pad comprises a fabric piece attached thereto and covering the elongated groove, the fabric piece having a higher elasticity than the adjacent seat surfaces of the seat pad. In other words, the fabric piece is more stretchable than the adjacent seat surfaces of the seat pad. The fabric piece can comprise a single fabric layer and the adjacent seat surfaces of the seat pad can comprise at least two material layers superposed to one another. The adjacent seat surfaces of the seat pad can comprise at least a top fabric layer superposed to a

bottom fabric layer and the material of the fabric piece can be different from the material of the top and the bottom fabric layers. The seat pad can comprise inner edges defining the elongated groove and the fabric piece can comprise corresponding lateral edges adjacent to a respective one of the inner edges of the seat pad, the inner edges of the seat pad and the fabric piece moving freely relatively to the cycling garment. In other words, the lateral edges of the seat pad and the fabric piece can be unattached to the cycling garment. The seat pad can be secured to the cycling garment at a peripheral edge thereof and the fabric piece can be secured to the cycling garment at a rear edge thereof.

[0016] According to still another general aspect, there is provided a seat pad for a cycling garment comprising a rear portion oriented to align with a buttocks region of a cyclist, an intermediate portion oriented to align with a perineum region of the cyclist, and a front portion extending forwardly of the intermediate portion, at least one of the rear portion and the front portion having at least one elongated groove aligned substantially along a longitudinal axis of the seat pad and extending inwardly from a peripheral edge of the seat pad, the at least one elongated groove having a length along the longitudinal axis longer than a width along the peripheral edge of the seat pad.

[0017] In an embodiment, the rear portion is separated into two seat surfaces including a padded area and one of the at least one elongated groove extends between the seat surfaces from the peripheral edge of the seat pad towards the intermediate portion, the padded areas having a length along the longitudinal axis and the elongated groove extends past a middle point of the padded area length towards the intermediate portion.

[0018] In an embodiment, the seat pad further comprises a fabric piece attached to the seat pad and covering the at least one elongated groove, the fabric piece having a higher elasticity than sections of the seat pad adjacent to the at least one elongated groove. The fabric piece can connect opposed inner edges of the seat pad defining the at least one elongated groove and the fabric piece can be thinner than the sections of the seat pad adjacent to the at least one elongated groove.

[0019] The fabric piece can be an elastic single layered fabric and the adjacent sections of the seat pad can comprise at least two material layers superposed to one another. The fabric piece can comprise meshed material.

[0020] According to still another general aspect, there is provided a cycling garment, comprising the above described seat pad. The seat pad can comprise inner edges defining the at least one elongated groove and the inner edges can be unattached to the cycling garment. The seat pad can comprise a fabric piece mounted to the seat pad and covering the at least one elongated groove, the fabric piece being secured to the cycling garment at a peripheral end thereof.

[0021] According to still another general aspect, there is provided a cycling garment comprising a seat pad having a rear section oriented to align with a buttocks region of a cyclist, an opposed front section and an intermediate section extending therebetween, the seat pad having a longitudinal axis extending from the front section towards the rear section and a substantially triangularly-shaped section extending inwardly from a peripheral edge of the seat pad in at least one of the front section and the rear section, the triangularly-shaped section being oriented along substantially the longitudinal axis and having two inner edges extending on each side of the longitudinal axis, the triangularly-shaped section creating a discontinuity by being more extensible than adjacent seat pad sections.

[0022] In an embodiment, the triangularly-shaped section has a length along the longitudinal axis longer than a width along the peripheral edge of the seat pad.

[0023] In an embodiment, the rear portion is separated into two seat surfaces including a padded area and the triangularly-shaped section extends between the seat surfaces from the peripheral edge of the seat pad towards the intermediate portion, the padded areas having a length along the longitudinal axis and the triangularly-shaped section extends past a middle point of the padded area length towards the intermediate portion.

[0024] In an embodiment, the triangularly-shaped section comprises an elastic fabric piece connecting opposed inner edges of the seat pad adjacent to the lateral edges of the triangularly-shaped section, the fabric piece being thinner than the adjacent

seat pad sections. The fabric piece can be an elastic single layered fabric and the adjacent seat pad sections can comprise at least two material layers superposed to one another. The fabric piece can comprise meshed material. The inner edges of the seat pad and the lateral edges of the fabric piece can be unattached to the cycling garment and the fabric piece can be secured to the cycling garment at a peripheral end thereof.

[0025] The triangularly-shaped section can have a tip which at least one of corresponds substantially to a coccyx tip of the cyclist wearing the cycling garment, can be located forwardly of the coccyx tip of the cyclist wearing the cycling garment, and can extend past a middle point of the seat surfaces along a longitudinal axis of the seat pad and towards the intermediate portion.

[0026] The length of the triangularly-shaped section can range between seven and thirteen centimeters (7-13 cm) and the width of the triangularly-shaped section at the peripheral edge of the seat pad can range between 0.5 and five centimeters (0.5-5 cm).

[0027] The triangularly-shaped section can be V-shaped and can define an angle ranging between five and thirty degrees (5-30 °).

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] Fig. 1 is a top plan view of a cyclist seat pad in accordance with an embodiment, wherein a fabric piece is mounted in an elongated groove defined between two seat surfaces including cushioning pads;

[0029] Fig. 2 is a sectional view along section lines 2-2 of the cyclist seat pad shown in Fig. 1;

[0030] Fig. 3 is a top plan view of a cyclist seat pad in accordance with another embodiment, wherein the V-shaped groove defined between the two seat surfaces is material free;

[0031] Fig. 4 is a perspective view of the cyclist seat pad shown in Fig. 1 disposed in a cycling garment; and

[0032] Fig. 5 is a top plan view of a cyclist seat pad in accordance with another embodiment and including an elongated groove extending in a front portion of the seat pad.

[0033] It will be noted that throughout the appended drawings, like features are identified by like reference numerals.

DETAILED DESCRIPTION

[0034] Fig. 1 shows an embodiment of a cyclist seat pad 20, which is a padded element intended to be disposed in a cycling garment 68 (Fig. 3), or cycling pants, for providing a cyclist with enhanced comfort while sitting upon and riding a bicycle or the like. The seat pad is also referred to as a chamois or a chamois lining.

[0035] The term “cycling garment” is intended to mean cycling pants, shorts or knicks, bicycling pants, shorts or knicks, baggy shorts or pants, bib shorts or pants, and other similar items.

[0036] The seat pad includes a front portion 22, an opposing rear portion 24, and an intermediate portion 26 disposed between the front and rear portions 22 and 24, respectively. The front portion 22 is generally U-shaped and is designed to contact and support the lower abdominal region (or the lower pelvic region) of the cyclist. The rear portion 24 of the seat pad 20 is somewhat bird tail-shaped and is substantially wider than the front portion 22. The rear portion 24 is generally oriented to align with the buttocks region of the cyclist and includes two seat surfaces 28 spaced-apart from one another. As it will be described in more details below, a rear elongated groove 30 extends between the two seat surfaces 28. The intermediate portion 26 serves to connect the front and rear portions 22 and 24, respectively, and includes curvilinear contouring along sides thereof. When the seat pad 20 is properly utilized by the cyclist, the intermediate portion 26 contacts the perineum region, between the legs, and upper thigh regions thereof.

[0037] Central padded areas 32 are disposed centrally on the seat pad 20. In the embodiment shown, the padded areas 32 are located in the intermediate portion 26 and the rear portion 24. However, in an alternative embodiment (not shown), the

padded areas 32 can also be located in the front portion 22 to provide additional support and padding to the cyclist's lower pelvic area.

[0038] The seat pad 20 further includes an outer area 34 which extends substantially around a periphery of the padded areas 32. The padded areas 32 include padding, as discussed further herein, and are substantially thicker than the outer area 34. The outer area 34 may include padding similar to that of the padded areas 32 or, alternatively, the outer area 34 may be relatively flat, or have differing degrees of padding.

[0039] The padded areas 32 include two spaced-apart buttocks padded areas 36 disposed and designed for contact with the buttocks of the cyclist. The padded areas 32 further include a perineum padded area 38 extending forwardly from the buttocks padded areas 36 along a longitudinal axis A-A into the intermediate portion 26 of the seat pad 20. The perineum padded area 38 is intended for contact with the perineum area of the cyclist.

[0040] The padded areas 32 can further include a front padded area 239, as shown in Fig. 5, designed to contact and support the lower abdominal region (or the lower pelvic region) of the cyclist. The front padded area 39 extends forwardly of the perineum padded area 38.

[0041] One skilled in the art will appreciate that the shape, number, and configuration of padded areas can vary from the one shown in the accompanying drawings.

[0042] As mentioned above, the outer area 34 extends around the padded areas 32 and includes side wings 40 disposed generally at the intermediate portion 26 of the seat pad 20, adjacent to the perineum padded area 38. The side wings 40 can be pre-shaped (or pre-tensioned), i.e. extending downwardly into a concave shape, to provide snug anatomical conformation to the cyclist's perineum and upper thigh regions, again enhancing overall comfort.

[0043] Thinned hinge lines 42 separate the buttocks padded areas 36 from the perineum padded area 38. The thinned hinge lines 42 are portions of the seat pad 20 having a reduced thickness. The thinned hinge lines 42 allow an area of the seat pad 20 to pivot, or otherwise move, relative to another portion. In alternative

embodiments (not shown), additional thinned hinge lines can traverse a perimeter of the padded areas 32 separating the same from the outer area 34 and further thinned hinge lines can extend across the outer area 34 or within the padded areas 32.

[0044] The hinge lines 42 can be formed by permanently compressing the padded areas 32 to obtain the desired reduced thickness thereof. For instance, the compression can be achieved by heat treatment or by a high frequency fusion treatment.

[0045] While the thinned hinged lines 38 are described herein and throughout with regard to specific dispositions thereof on the seat pad 20, this is in no way intended to limit the scope of the formation and the positioning of the hinge lines 42. As mentioned, such lines 42 provide the seat pad 20 with an advantageous degree of flexibility. Accordingly, the thinned hinge lines 42 may be disposed at any position on the seat pad 20 as desired to provide enhanced flexibility thereto, addition comfort and/or to bring any additional advantages thereof to the seat pad 20.

[0046] In an embodiment, the seat pad 20 is a multi-layered element including an inner (or top) layer 62, a middle layer 63, and an outer (or bottom) layer 64 as shown in Fig. 2. The top layer 62 contacts the body of the cyclist during use of the seat pad 20, 120, the bottom layer is directly superposed to a cycling garment 68 opposite the body of the cyclist, and the middle layer 63 is disposed between the top and bottom layers 62, 64, respectively.

[0047] While various individual layers of the seat pad 20 are herein specified, this description is only exemplary and is not intended to limit or otherwise narrow the invention. The seat pad 20 may include any number of layers in any potential combination thereof as desired for achieving the comfort properties and padding provided by the seat pad 20. Further, it shall be understood that the layers composing the seat pad 20 may individually be formed of a uniform, monolithic material construction or, alternatively, such layers may themselves be composed of a plurality of material layers. Thus when describing and reciting "a layer" of the seat pad 20 herein, any of these constructions are contemplated, as well as combinations and variations thereof. In another alternative embodiment, the seat pad 20 can include two layers a top layer and a bottom layer, which is also a padding layer.

[0048] The top layer 62 is generally composed of a cloth-like material. That is, the top layer 62 includes a thin, generally non-compressible, woven fibrous material formed of, for example, polyester such as brushed micro-fiber polyester. The top layer 62 includes a thickness of approximately 0.2 to four millimeters (0.2-4 mm) and, in another embodiment, approximately 0.3 to two millimeters (0.3-2 mm).

[0049] The middle layer 63 is a padding layer and can be composed of thick compressibly resilient open-cell foam, such as polyurethane or another "air breathing" material, or appropriate gels. The middle layer 63 includes a thickness of approximately ten to fifteen millimeters (10-15 mm). In the embodiment of the seat pad 20, the foam padding material composing the middle layer 63 may include a plurality of layers, as further described in US patent application no. 2007/0174953, incorporated herein by reference in its entirety. Furthermore, the foam density can vary within the seat pad 20.

[0050] The bottom layer 64 is composed of a cloth-like material. That is, the bottom layer 64 includes a thin, generally non-compressible, woven fibrous material formed of a synthetic polymer, such as a polyamide, for example nylon. The bottom layer 64 includes a thickness of approximately 0.2 to two millimeters (0.2-2 mm) and, in another embodiment, approximately 0.3 to one millimeter (0.3-1 mm).

[0051] The top layer 62, the middle layer 63, and the bottom layer 64 are fixed together to form the multi-layered seat pad 20. The various layers are fixed together in any sufficient manner which establishes a lasting bond therebetween. For example, the layers may be temperature bonded, high frequency fusion bonded, affixed together by use of an ultrasound gun, adhered together with an adhesive such as glue, etc. During this bonding process the materials of the various layers may be compressed or otherwise made smaller as desired to achieve a final seat pad 20 of a specific thickness. For example, top, middle, and bottom layers having original thicknesses of one millimeter (1 mm), fifteen millimeters (15 mm), and one millimeter (1 mm), respectively, may be compressed or reduced to form into the seat pad 20 having a maximum thickness of approximately fifteen millimeters (15 mm) or less.

[0052] Thus to define the several padded areas 32, outer area 34, and hinge lines 38 having distinct thicknesses, the multi-layered seat pad 20 can be in a fully expanded state in few regions, a partially compressed state in other regions, and in a compressed state in still other regions.

[0053] Furthermore, the seat pad 20 fabricated as discussed above, can include a plurality of regions having distinct thicknesses due to overlapping or non-overlapping of the top, middle, and bottom layers. That is, due to the varying shapes and sizes of the layers composing the seat pad 20, some areas of the pad 20 include all three layers overlapped and in an uncompressed state and thus include a maximum thickness, while other areas of the pad do not include all of the layers overlapped upon each other, partially compressed, entirely compressed or uncompressed, and thus these areas include a reduced thickness.

[0054] In a particular embodiment, the front portion 22 of the seat pad 20 has a thickness of approximately two millimeters (2 mm). The side wings 40 of the intermediate portion 26 have a thickness of approximately one millimeter (1 mm). The front and external padded areas 38a and the rear padded area 38c of the intermediate portion 26 have a thickness of approximately twelve millimeters (12 mm) and the front and internal padded area 38b extending between the external padded areas 38a has a thickness of approximately ten millimeters (10 mm). The padded areas 36 of the seat surfaces 28 have an increasing thickness from the peripheral padded area 36a to the central padded area 36c. More particularly, in the embodiment shown, the peripheral padded areas 36a of the seat surfaces 28 have a thickness of approximately seven millimeters (7 mm), the intermediate padded areas 36b of the seat surfaces 28 have a thickness of approximately twelve millimeters (12 mm), and the central padded areas 36c of the seat surfaces 28 have a thickness of approximately fifteen millimeters (15 mm). The section 66 extending between the seat surfaces 28 has a thickness of approximately one millimeter (1 mm). It is appreciated that the thicknesses given above are exemplary only. The materials composing the various regions of the pad 20, and the construction thereof, provide the cyclist with sufficient support, enhanced padding against shock and impact, increased flexibility, temperature control, and moisture absorption and evacuation.

[0055] As exemplified above, the padded areas 32 and the outer areas 34 contouring the padded areas 32 are relatively thick. Therefore, the flexibility of this seat pad 20 in the rear portion 24 is relatively limited. During the pedaling operation, as a first leg, for instance the right leg, is extended, the corresponding right buttock member moves downwardly in response thereto and at the same time that the right leg is extended, the left leg moves upwardly by a proportional amount. Similarly, the left buttock member moves upwardly in proportion to the downwardly movement of the right buttock member. Thus, for a cyclist's comfort, the seat pad 20 should be flexible enough to follow the buttock movements.

[0056] As shown in Fig. 1, the elongated groove 30 is provided between the two seat surfaces 28 to increase the flexibility of the rear portion 24 of the seat pad 20. The groove 30 extends from a rear end 44 of the seat pad 20 towards the intermediate portion 26 of the seat pad 20. The groove 30 is defined between the two seat surfaces 28 and between their corresponding padded areas 36. In the embodiment shown, the groove 30 is relatively long and narrow and the elongated groove 30 has a length 46 longer than a width 48 at the rear end 44 of the seat pad 20, or along a peripheral edge of the seat pad. In the embodiment shown, the groove is a notch, i.e. it is a V-shaped cut. In an embodiment, the groove 30 has a tip 50 which substantially corresponds to a coccyx tip of a cyclist wearing the cycling garment 68 including the seat pad. In an alternative embodiment, the tip 50 is located forwardly of the coccyx tip of the cyclist, towards the perineum region. In an embodiment, the tip 50 corresponds substantially to the beginning of the seat pad portion extending between the cyclist's perineum/buttocks and the bicycle seat when a cyclist wearing the seat pad is seated on the bicycle seat, i.e. the elongated groove does not extend in the seat pad portion extending between the cyclist's perineum/buttocks and the bicycle seat. In other words, the tip 50 of the elongated groove 30 extends substantially to a beginning of a rear end of a bicycle seat when a cyclist wearing the cycling garment including the seat pad 20 is seated on the bicycle seat. The length 46 of the elongated groove 30 from the rear end 44 of the seat pad 20 to the tip ranges between about seven and thirteen centimeters (7-13 cm), in an alternative embodiment, the length 46 of the elongated groove 30 is between about nine and eleven centimeters (9-11 cm). The width 48 at the rear end 44 (at the peripheral

edge of the seat pad) of the seat pad 20 ranges up to five centimeters (5 cm), in an alternative embodiment, the width 48 of the elongated groove 30 is between about two and four centimeters (2-4 cm). In an embodiment, the elongated groove is an elongated cut defined in the seat pad 20. The elongated groove 30 defines an angle (α) between about five and thirty degrees (5-30 °), in an alternative embodiment, the angle (α) is between about ten and twenty-five degrees (10-25 °).

[0057] In an embodiment, the padded areas 36 in the seat surfaces 28 have a length along the longitudinal axis A-A of the seat pad 20 and the elongated groove 30 extends past a middle point of the padded area length, towards the intermediate portion 26.

[0058] In the embodiment shown in Fig. 1, a fabric piece 52 extends in the elongated groove 30 and connects the seat surfaces 28. In an embodiment, the fabric piece 52 has a higher elasticity than the adjacent seat surfaces 28 of the seat pad 20, i.e. the fabric piece 52 is more stretchable than the adjacent seat surfaces 28. The elastic properties of the fabric piece 52 are enhanced in comparison with the properties of the material(s) composing the padded areas 36 and the outer areas 34 adjacent to the fabric piece 52. In an embodiment, the fabric piece 52 is single layered. In an embodiment, the fabric piece 52 is thinner than the padded areas 36 of the seat pad 20. It is also thinner or has substantially the same thickness as the outer areas 34 contouring the padded areas 36 for enhanced flexibility. For instance and without being limitative, the fabric piece 52, which in the embodiment is a substantially elastic material, can be a meshed material. Thus, the groove 30 with mesh material extending therein also enhances the aeration properties of the seat pad 20. The perforations in the mesh material increase air and moisture exchange.

[0059] In an embodiment, the fabric piece 52 is made of material(s) different than materials of the top, middle, and bottom fabric layers 62, 63, 64 of the seat pad 20.

[0060] In an embodiment, a rear end 56 (or peripheral edge) of the fabric piece 52, in continuation with the peripheral edge of the seat pad 20, is attached to the edge of cycling garment 68 in which the seat pad 20 is mounted and the two opposed inner edges 54 defining the groove 30 and adjacent and corresponding lateral edges of the fabric piece 52 are not attached to the cycling garment 68, i.e. they can move

relatively to the cycling garment 68. In the embodiment shown, the rear end 56 of the fabric piece 52 is stitched to the cycling garment 68. In an alternative embodiment, the inner edges 54 of the seat pad 20 and/or the lateral edges of the fabric piece 52 can also be stitched to the cycling garment 68. It is appreciated that in an alternative embodiment, the rear end 56 and the inner edges 54 of the seat pad 20 and/or the lateral edges of the fabric piece 52 can be attached to the cycling garment 68. In another alternative embodiment, only the inner edges 54 of the seat pad 20 and/or the lateral edges of the fabric piece 52 can be attached to the cycling garment 68.

[0061] Referring now to Fig. 3, there is shown another embodiment shown wherein the features are numbered with reference numerals in the 100 series which correspond to the reference numerals of the previous embodiment. In Fig. 3, the elongated groove 130 is free of any material extending between its two opposed inner edges 154, i.e. the two inner edges are not connected through a fabric piece. The inner edges 154 of the seat pad 120 may or may not be attached, for instance stitched, to the cycling garment 68 (Fig. 4) in which the seat pad 120 is inserted.

[0062] In an embodiment (not shown), sew lines extend through the seat pad 120 and the cycling garment 68 along the inner edges 154. In an alternative embodiment, the sew line(s) that extend(s) along the peripheral edge of the seat pad 120 ends at a rear end of the groove 30 and the inner edges 154 are not sewed to the cycling garment 68.

[0063] The seat pad 20, 120 further includes aeration windows 44, 144 defined in the front portion 22, 122. In the embodiment shown, the aeration window 44, 144 exposes a piece of mesh material 60, 160 having perforations therein for an increased air and moisture exchange between the cyclist's side of the seat pad 20, 120 and an opposite outer side and vice versa.

[0064] Mesh material 60, 160 is a synthetic or fabric-like perforated flexible material which perforation units are each of a size and shape enabling free bodily heat release and free humidity escape therethrough. Furthermore, mesh material is usually a relatively elastic fabric.

[0065] It is appreciated that, in an alternative embodiment (not shown), the aeration window 44, 144 can be free of any material, i.e. it exposes the cycling garment 68 when mounted thereto, or it can expose any other fabric.

[0066] In alternative embodiments (not shown), the seat pad 20, 120 may include other perforations or aeration windows which extend entirely therethrough to provide ventilation during use of the seat pad 20, 120. Such ventilation allows airflow to move from the cyclist's side of the seat pad 20, 120 to an opposite outer side and vice versa. This airflow cools the cyclist and allows fluid evaporation to thus keep the cyclist dry for enhanced comfort. Furthermore, the perforations and aeration windows are sized and disposed to allow the passage of fluid, that is, perspiration, rainwater, etc., which has accumulated on the seat pad 20, 120 against the cyclist's body, and which is permitted to drain from the cyclist's side of the pad to the outer, exterior side. The seat pad 20, 120 is typically disposed in a cycling pant formed of a moisture wicking material. Thus, the fluid which drains through the perforations and aeration windows to the outer side of the pad is promptly wicked to an exterior of the pant away from the cyclist's body. This provides enhanced comfort and dryness. Additionally, the perforations and aeration windows reduce the overall weight of the seat pad 20, 120 and provide increased flexibility thereof, thus enhancing comfort to the cyclist. The perforations may include a recess, i.e. a generally planar surface of a reduced thickness relative to the remainder of the padded areas.

[0067] Referring now to Fig. 5, there is shown another embodiment wherein the features are numbered with reference numerals in the 200 series which correspond to the reference numerals of the previous embodiment. The seat pad 220 of Fig. 5 includes a front elongated groove 270 extending substantially parallel to the longitudinal axis A-A in the front portion 222 of the seat pad 220. As the rear elongated groove 230, the front elongated groove 270 increases the flexibility of the front portion 222 of the seat pad 220. The groove 270 extends from a front end 272 of the seat pad 220 (or the peripheral edge of the seat pad 220) towards the intermediate portion 226 of the seat pad 220. The groove 270 separates the front portion 222 into two portions. In the embodiment shown, the groove 270 is a relatively long and narrow notch, i.e. a V-shaped cut, with a length 246 longer than its width 248 at the front end 272 (or peripheral edge) of the seat pad 220. In an

embodiment, the groove 270 has a tip 250 which is located approximately at the junction of the outer area 234 and an adjacent padded area 239. It is appreciated that in alternative embodiments, the groove 270 can extend in the inner padded area(s) 239 or can be shorter. In the embodiment shown, the tip 250 corresponds substantially to the beginning of the seat pad padded area 239 having an increased thickness. The length 246 of the elongated groove 270 from the front end 272 of the seat pad 220 to the tip ranges between about three and thirteen centimeters (3-13 cm), in an alternative embodiment, the length of the elongated groove 270 is between about five and ten centimeters (5-10 cm). The width 248 at the front end 272 of the seat pad 220 ranges up to about five centimeters (5 cm), in an alternative embodiment, the width 248 of the elongated groove 270 is between about one and four centimeters (1-4 cm). In an embodiment, the elongated groove 270 is an elongated cut defined in the seat pad 220. The elongated groove 270 defines an angle (α) between about five and thirty degrees (5-30 °), in an alternative embodiment, the angle (α) is between about ten and twenty-five degrees (10-25 °).

[0068] In the embodiment shown in Fig. 5, a fabric piece 252, such as the one described above in reference to the rear groove 30, extends in the elongated groove 270 and connects the two front portions. In an embodiment, the fabric piece 252 has a higher elasticity than the adjacent front portions of the seat pad 220, i.e. the fabric piece 252 is more stretchable than the adjacent front portions. The elastic properties of the fabric piece 252 are enhanced in comparison with the properties of the material(s) composing the padded areas 239 and the outer areas 234 adjacent to the fabric piece 252. The fabric piece 252 can be single layered and/or thinner than the padded areas 239 of the seat pad 220 and the adjacent front portions of the seat pad 220. It is also thinner or has substantially the same thickness as the outer areas 234 contouring the padded areas 236, 239 for enhanced flexibility. In an embodiment, the elastic properties of the fabric piece are enhanced in comparison with the properties of the material(s) composing the padded areas 236, 239 and the outer areas 234. For instance and without being limitative, the fabric piece 252 can be a meshed material. Thus, the groove 270 with mesh material extending therein also enhances the aeration properties of the seat pad 220. The perforations in the mesh material increase air and moisture exchange.

[0069] In an embodiment, the fabric piece 252 is made of material(s) different than materials of the top, middle, and bottom fabric layers 262, 263, 264 of the seat pad 220.

[0070] In an embodiment, a front end (or peripheral edge) of the fabric piece 252, in continuation with the peripheral edge of the seat pad 220, can be secured to a cycling garment (not shown) in which the seat pad 220 is mounted and the two opposed inner edges 254 defining the groove 270 and adjacent and corresponding lateral edges of the fabric piece 252 are not attached to the cycling garment, i.e. they can move relatively to the cycling garment. In the embodiment shown, the front end of the fabric piece 252 is stitched to the cycling garment. In an alternative embodiment, the inner edges 254 of the seat pad 220 and/or the lateral edges of the fabric piece 252 can also be stitched to the cycling garment. It is appreciated that in an alternative embodiment, the front end and the inner edges 254 of the seat pad 220 and/or the lateral edges of the fabric piece 252 can be attached to the cycling garment. In another alternative embodiment, only the inner edges 254 can be secured to the cycling garment, or any combinations thereof.

[0071] In an alternative embodiment (not shown), the elongated groove 270 can be free of any material extending between its two opposed inner edges 254, i.e. the two inner edges 254 are not connected. The inner edges 254 of the seat pad 220 may or may not be attached, for instance stitched, to the cycling garment to which the seat pad 220 is mounted.

[0072] It is appreciated that combinations of the above-described seat pads 20, 120, 220 can be made. For instance and without being limitative, a seat pad can include one or several front and rear elongated grooves 30, 130, 230, 270, with or without a fabric piece 252 extending therein. It can also include aeration windows 44, 144.

[0073] The seat pad 20, in one embodiment, is secured to the cycling garment 68 as shown in Figure 4. The garment 68 includes any clothing item to be worn by the cyclist proximate the groin and crotch area such as, for example, underwear, cycling pants, shorts or knicks, bicycling pants, shorts or knicks, baggy shorts or pants, bib shorts or pants, etc. The seat pad 20 is fixed to the cycling garment 68 by any suitable method including, but not limited to, stitching, temperature or fusion bonding,

adhering with a bonding agent, etc., and any combination thereof. If stitching is used for fixing the seat pad to the cycling garment stretch stitches can be used.

[0074] When the seat pad 20 is mounted to the cycling garment 68, the inner edges 54 defining the groove 30 and/or the rear end 56 may or may not be secured to the cycling garment 68.

[0075] It is appreciated that the design of the seat pad 20, 120, including the shape, position, and thickness of the padded areas, can differ from the above described and illustrated embodiments. The design of the seat pad can be adapted to the cyclist's gender and anatomy. For instance and without being limitative, a female seat pad is generally thinner and smaller than a male seat pad.

[0076] The seat pad has been generally described herein as being a member mounted within a pant to be worn by a cyclist, etc. Alternatively, however, the construction of the seat pad may be formed integrally within the pant. That is, it is not required that the seat pad be an element separate from the pant. The pad and its unique features may be formed integrally within the material forming the pant.

[0077] While the invention has been described with reference to an exemplary embodiment, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this invention, but that the invention will include all embodiments falling within the scope of the appended claims.

CLAIMS:

1. A cycling garment comprising a seat pad with a front portion, an opposing rear portion, and an intermediate portion disposed between the front and rear portions, the rear portion having an elongated groove extending between two seat surfaces having padded areas, the elongated groove extending from a rear end of the seat pad towards the intermediate portion, the elongated groove having a tip which at least one of corresponds substantially to a coccyx tip of the cyclist wearing the cycling garment, is located forwardly of the coccyx tip of the cyclist wearing the cycling garment, and extends past a middle point of the seat surfaces along a longitudinal axis of the seat pad and towards the intermediate portion.
2. A cycling garment as claimed in claim 1, wherein the elongated groove extends along the longitudinal axis of the seat pad and has a length along the longitudinal axis longer than a width along a peripheral edge of the seat pad.
3. A cycling garment as claimed in claim 2, wherein the length of the elongated groove ranges between seven and thirteen centimeters and the width of the elongated groove at the rear end of the seat pad ranges between 0.5 and five centimeters.
4. A cycling garment as claimed in claim 3, wherein the elongated groove is V-shaped and defines an angle ranging between five and thirty degrees.
5. A cycling garment as claimed in any one of claims 1 to 4, wherein the seat pad comprises a fabric piece attached thereto and covering the elongated groove, the fabric piece having a higher elasticity than the adjacent seat surfaces of the seat pad.

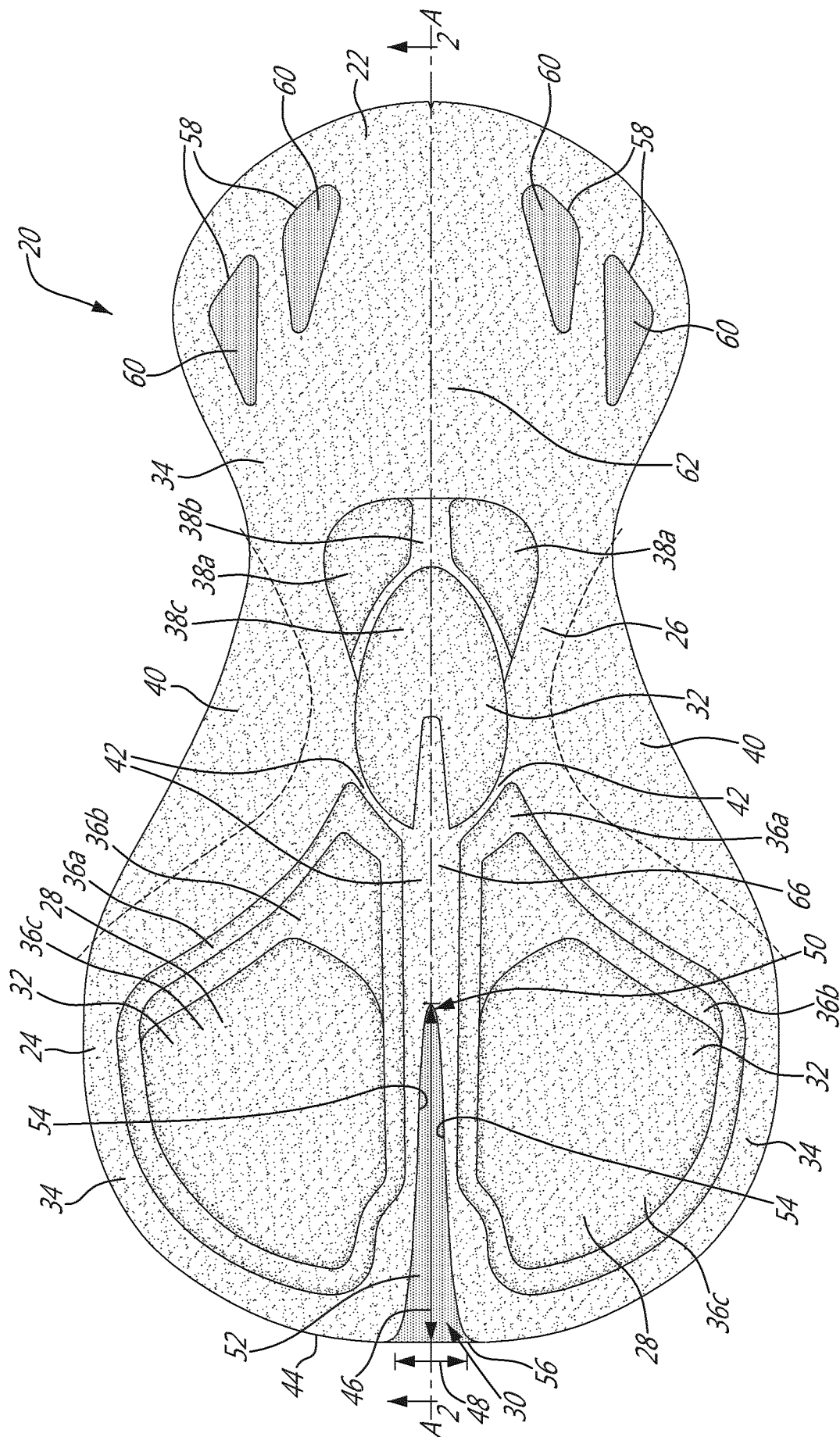
6. A cycling garment as claimed in claim 5, wherein the fabric piece comprises a single fabric layer and the adjacent seat surfaces of the seat pad comprises at least two material layers superposed to one another.
7. A cycling garment as claimed in claim 6, wherein the adjacent seat surfaces of the seat pad comprises at least a top fabric layer superposed to a bottom fabric layer and the material of the fabric piece is different from the materials of the top and the bottom fabric layers.
8. A cycling garment as claimed in any one of claims 5 to 7, wherein the seat pad comprises inner edges defining the elongated groove and the fabric piece comprises corresponding lateral edges adjacent to a respective one of the inner edges of the seat pad, the inner edges of the seat pad and the fabric piece moving freely relatively to the cycling garment.
9. A cycling garment as claimed in any one of claims 5 to 8, wherein the seat pad is secured to the cycling garment at a peripheral edge thereof and the fabric piece is secured to the cycling garment at a rear edge thereof.
10. A seat pad for a cycling garment comprising a rear portion oriented to align with a buttocks region of a cyclist, an intermediate portion oriented to align with a perineum region of the cyclist, and a front portion extending forwardly of the intermediate portion, at least one of the rear portion and the front portion having at least one elongated groove aligned substantially along a longitudinal axis of the seat pad and extending inwardly from a peripheral edge of the seat pad, the at least one elongated groove having a length along the longitudinal axis longer than a width along the peripheral edge of the seat pad.

11. A seat pad for a cycling garment as claimed in claim 10, wherein the rear portion is separated into two seat surfaces including a padded area and one of the at least one elongated groove extends between the seat surfaces from the peripheral edge of the seat pad towards the intermediate portion, the padded areas having a length along the longitudinal axis and the elongated groove extends past a middle point of the padded area length towards the intermediate portion.
12. A seat pad as claimed in claim 10, further comprising a fabric piece attached to the seat pad and covering the at least one elongated groove, the fabric piece having a higher elasticity than sections of the seat pad adjacent to the at least one elongated groove.
13. A seat pad as claimed in claim 12, wherein the fabric piece connects opposed inner edges of the seat pad defining the at least one elongated groove and the fabric piece is thinner than the sections of the seat pad adjacent to the at least one elongated groove.
14. A seat pad as claimed in one of claims 12 and 13, wherein the fabric piece is an elastic single layered fabric and the adjacent sections of the seat pad comprises at least two material layers superposed to one another.
15. A seat pad as claimed in any one of claims 12 to 14, wherein the fabric piece comprises meshed material.
16. A cycling garment, comprising a seat pad as claimed in any one of claims 10 to 15.
17. A cycling garment as claimed in claim 16, wherein the seat pad comprises inner edges defining the at least one elongated groove and the inner edges are unattached to the cycling garment.

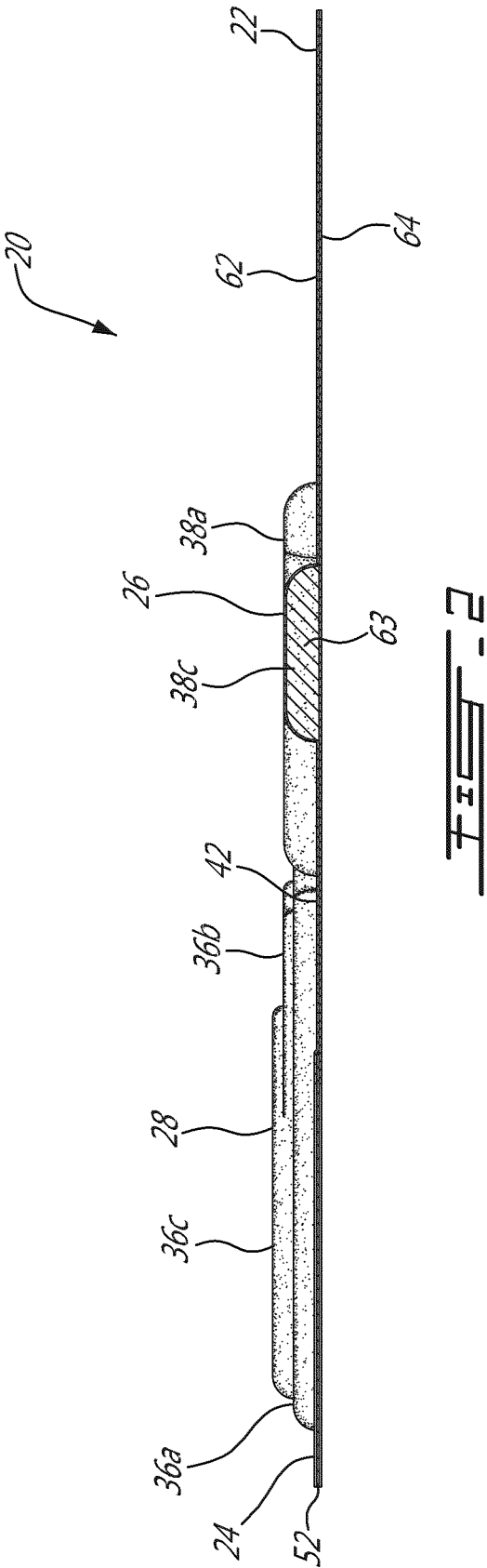
18. A cycling garment as claimed in one of claims 16 and 17, wherein the seat pad comprises a fabric piece mounted to the seat pad and covering the at least one elongated groove, the fabric piece being secured to the cycling garment at a peripheral end thereof.
19. A cycling garment comprising a seat pad having a rear section oriented to align with a buttocks region of a cyclist, an opposed front section and an intermediate section extending therebetween, the seat pad having a longitudinal axis extending from the front section towards the rear section and a substantially triangularly-shaped section extending inwardly from a peripheral edge of the seat pad in at least one of the front section and the rear section, the triangularly-shaped section being oriented along substantially the longitudinal axis and having two inner edges extending on each side of the longitudinal axis, the triangularly-shaped section creating a discontinuity by being more extensible than adjacent seat pad sections.
20. A cycling garment as claimed in claim 19, wherein the triangularly-shaped section has a length along the longitudinal axis longer than a width along the peripheral edge of the seat pad.
21. A cycling garment as claimed in claim 19, wherein the rear portion is separated into two seat surfaces including a padded area and the triangularly-shaped section extends between the seat surfaces from the peripheral edge of the seat pad towards the intermediate portion, the padded areas having a length along the longitudinal axis and the triangularly-shaped section extends past a middle point of the padded area length towards the intermediate portion.
22. A cycling garment as claimed in claim 19, wherein the triangularly-shaped section comprises an elastic fabric piece connecting opposed inner edges of the seat pad adjacent to the lateral edges

of the triangularly-shaped section, the fabric piece being thinner than the adjacent seat pad sections.

23. A cycling garment as claimed in claim 22, wherein the fabric piece is an elastic single layered fabric and the adjacent seat pad sections comprise at least two material layers superposed to one another.
24. A cycling garment as claimed in one of claims 22 and 23, wherein the fabric piece comprises meshed material.
25. A cycling garment as claimed in claim 22, wherein the inner edges of the seat pad and the lateral edges of the fabric piece are unattached to the cycling garment and the fabric piece is secured to the cycling garment at a peripheral end thereof.
26. A cycling garment as claimed in any one claims 22 to 25, wherein the triangularly-shaped section has a tip which at least one of corresponds substantially to a coccyx tip of the cyclist wearing the cycling garment, is located forwardly of the coccyx tip of the cyclist wearing the cycling garment, and extends past a middle point of the seat surfaces along a longitudinal axis of the seat pad and towards the intermediate portion.
27. A cycling garment as claimed in any one claims 22 to 26, wherein the length of the triangularly-shaped section ranges between seven and thirteen centimeters and the width of the triangularly-shaped section at the peripheral edge of the seat pad ranges between 0.5 and five centimeters.
28. A cycling garment as claimed in any one of claims 22 to 27, wherein the triangularly-shaped section is V-shaped and defines an angle ranging between five and thirty degrees.



THE



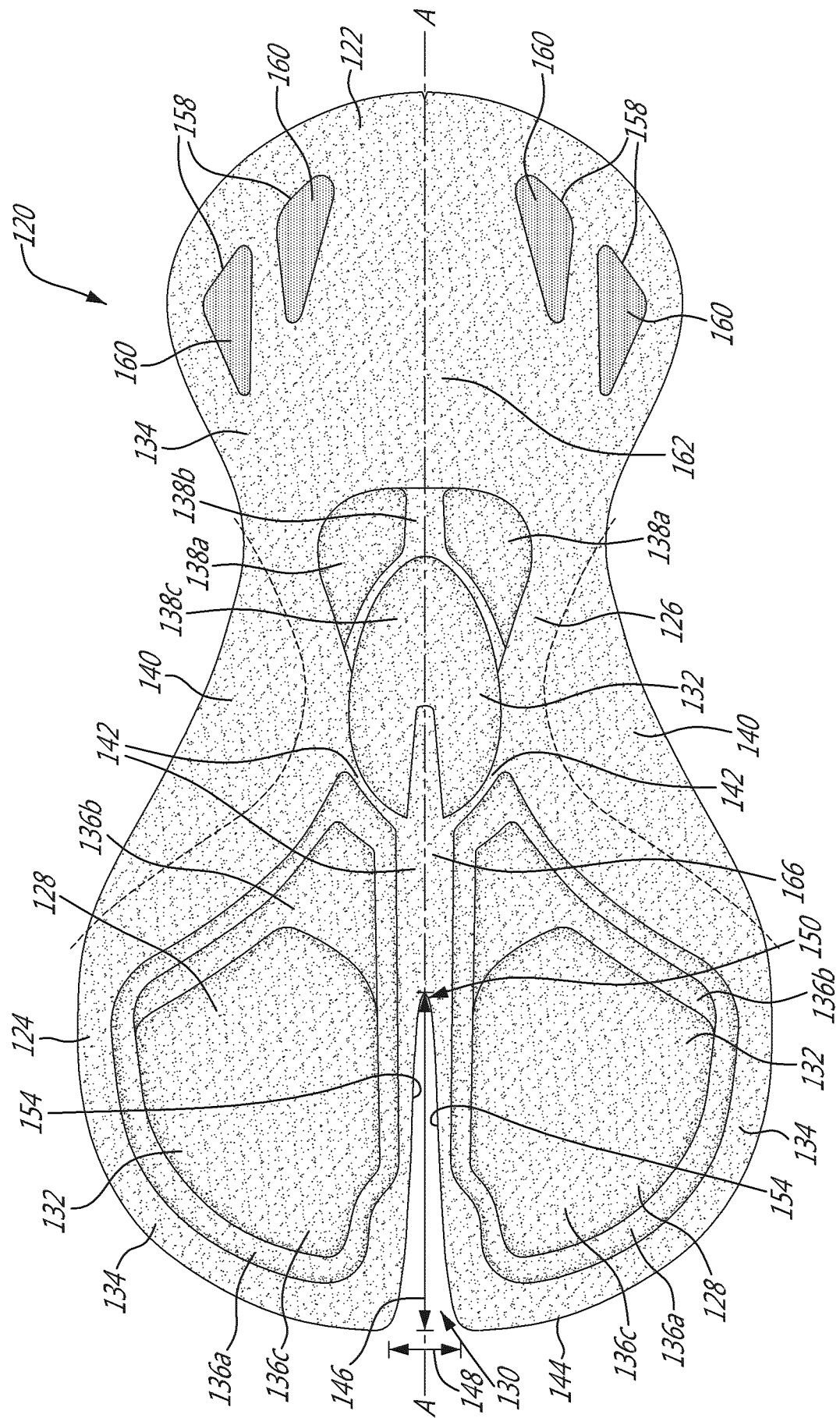


FIG. 3

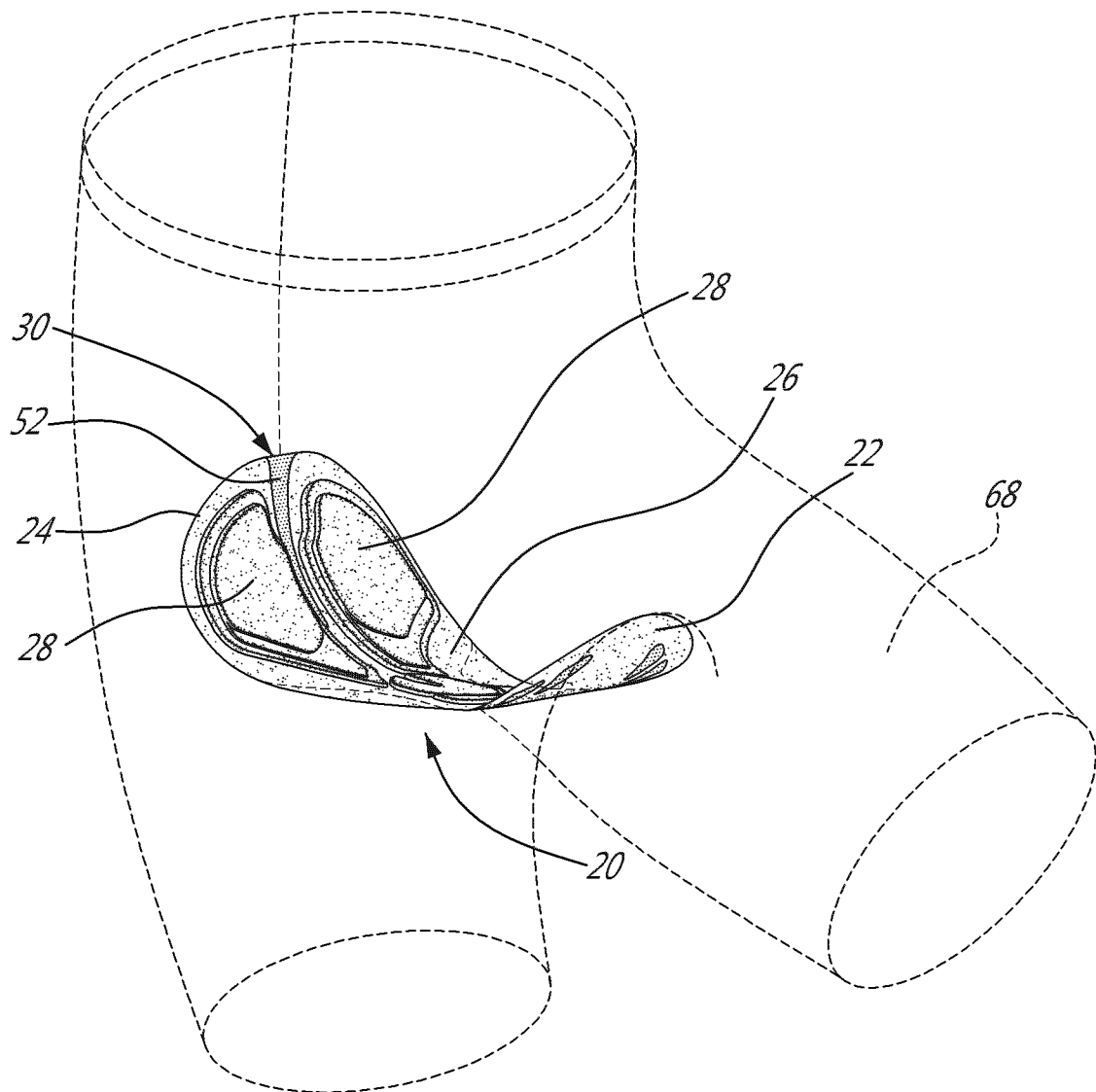
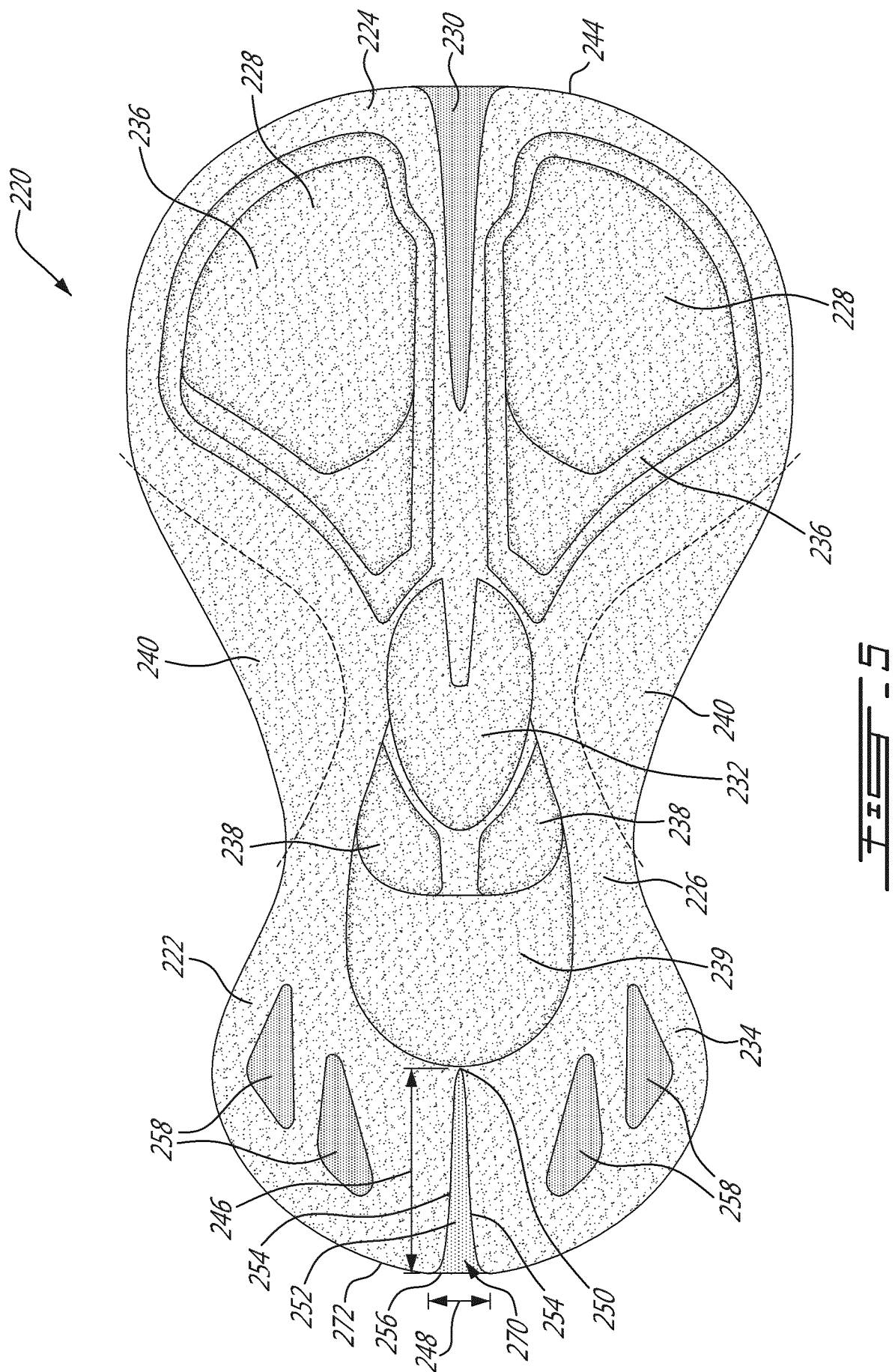


FIG. 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2010/001829

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **A41D 1/08** (2006.01) , **A41B 9/02** (2006.01) , **A41D 13/00** (2006.01) , **A41D 27/12** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(2006.01) & ECLA: A41D 13/00, 05(H) ; 27/12; 1/06, 08(A,C,K) A41B 9/00,02 A41F 19/00 A63B 71/08(A), 12(L)
USPC: 2/69, 214, 227, 228, 238, 300, 455, 466 450/98 297/200, 214, 219.11, 452.41

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)

Databases: TotalPatent™ and Canadian Patent Database

Keywords: garment, pants, rider*, cycl!, seat, crotch, buttock, groove, chamois, pad*, cushion, longitudin!

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US2006/0277662-A1 (COCCIA) 14 December 2006 (14-12-2006) *Whole document	10-13, 16 and 19-21
X	US2005/0210570-A1 (GARNEAU) 29 September 2005 (29-09-2005) *Whole document	10, 12, 13, 16, 19 and 20
A	US6687917-B2 (FORSYTH et al.) 10 February 2004 (10-02-2004) *Whole document	1-28
A	US6990693-B2 (RESCHEWITZ) 31 January 2006 (31-01-2006) *Whole document	1-28
A	US6928665-B1 (YATES) 16 August 2005 (16-08-2005) *Whole document	1-28
A	US5978970-A (BRIGHT) 09 November 1999 (09-11-1999) *Whole document	1-28

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

22 February 2011 (22-02-2011)

Date of mailing of the international search report

10 March 2011 (10-03-2011)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
Place du Portage I, C114 - 1st Floor, Box PCT
50 Victoria Street
Gatineau, Quebec K1A 0C9
Facsimile No.: 001-819-953-2476

Authorized officer

Eric E. Breton (819) 997-5209

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons :

1. ☐ Claim Nos. :
because they relate to subject matter not required to be searched by this Authority, namely :

2. ☐ Claim Nos. :
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically :

3. ☐ Claim Nos. :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows :

☒ See explanations on extra sheet on page 5 of 5

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claim Nos. :
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim Nos. :

- Remark on Protest** ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2010/001829

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US2006277662A1	14-12-2006	AT295691T	15-06-2005
		DE60204191D1	23-06-2005
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		EP1287754A1	05-03-2003
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		US2004143890A1	29-07-2004
		WO0224013A1	28-03-2002
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		WO9941134A1	19-08-1999
US7757311B2	20-07-2010	US2005210570A1	29-09-2005
		US7739754B2	22-06-2010
		US2007174953A1	02-08-2007

(Continuation of Box No. III)

The claims are directed to a plurality of alleged inventions as follows:

Group A - Claims 1-9 are directed to a cycling garment comprising a seat pad with a front portion, an opposing rear portion, and an intermediate portion disposed between the front and the rear portions, the rear portion having an elongated groove extending between two seat surfaces having padded areas, the elongated groove extending from a rear end of the seat pad towards the intermediate portion, the elongated groove having a tip which at least one of corresponds substantially to a coccyx tip of the cyclist wearing the cycling garment, is located forwardly of the coccyx tip of the cyclist wearing the cycling garment, and extends past a middle point of the seat surfaces along a longitudinal axis of the seat pad and towards the intermediate portion.

Group B - Claims 10-18 are directed to a seat pad for a cycling garment comprising a rear portion oriented to align with a buttocks region of a cyclist, an intermediate portion oriented to align with a perineum region of the cyclist, and a front portion extending forwardly of the intermediate portion, at least one of the rear portion and the front portion having at least one elongated groove aligned substantially along a longitudinal axis of the seat pad and extending inwardly from a peripheral edge of the seat pad, the at least one elongated groove having a length along the longitudinal axis longer than a width along the peripheral edge of the seat pad.

Group C - Claims 19-28 are directed to a cycling garment comprising a seat pad having a rear section oriented to align with a buttocks region of a cyclist, an opposed front section and an intermediate section extending therebetween, the seat pad having a longitudinal axis extending from the front section towards the rear section and a substantially triangularly-shaped section extending inwardly from a peripheral edge of the seat pad in at least one of the front section and the rear section, the triangularly-shaped section being oriented along substantially the longitudinal axis and having two inner edges extending on each side of the longitudinal axis, the triangularly-shaped section creating a discontinuity by being more extensible than adjacent seat pad sections.

Rule 13 of the PCT provides that an international application should relate to only one invention or, if there is more than one invention, the inclusion of those inventions in one international application is only permitted if all inventions are so linked as to form a single general inventive concept. With respect to a group of inventions claimed in an international application, unity of invention exists only when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" is defined in **Rule 13.2 of the PCT** as meaning those technical features that define a contribution which each of the inventions, considered as a whole, makes over the prior art. The problem in this case is that there is no special technical feature which would link the claims of Group A with the claims of Group B and the claims of Group C as specified above. The claims of Groups A and B define a seat pad with an elongated groove. The claims of Group A differ from those of Group B by defining a groove having a tip which is located to one of three specific places along the longitudinal axis. The claims of Group B define the length and the width of the groove (two features not in Group A). The claims of Group C define a seat pad having a triangularly-shaped section creating a discontinuity by being more extensible than adjacent seat pad sections. This triangularly-shaped section is not found in Group A or Group B.