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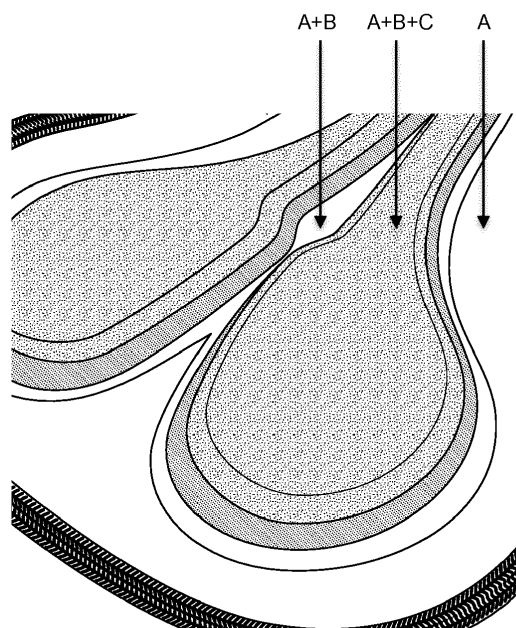
(54) **SPORT PANTS WITH AN EXTERNALLY LOCATED CHAMOIS**

(57) This invention generally relates to sport pants with an externally located chamois, whereby the chamois comprises at least two layers, whereby the chamois is separated from the body by a protective layer. The sport pants are designed with specialised cut-outs, both for male and female cyclists.

The chamois is preferably located near the crotch and buttocks region, and is designed in a way that it con-

forms the anatomical figure of the athlete, i.e. being able to fit the buttocks to e.g. a saddle in a comfortable manner, thereby reducing the chafing of the body and increasing the adhesion of the body to the saddle. Furthermore, moisture is transported towards the most outer foam-like member, comprising EVAPOR foam which is super breathable, vaporises the moisture and optimizes ventilation.

Fig. 2



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Description

FIELD OF THE INVENTION

[0001] This invention generally relates to sport pants with an externally located chamois, whereby the chamois comprises at least two layers, whereby the chamois is separated from the body by a protective layer. The sport pants are designed with specialised cut-outs, both for male and female cyclists.

[0002] The chamois is preferably located near the crotch and buttocks region, and is designed in a way that it conforms the anatomical figure of the athlete, i.e. being able to fit the buttocks to e.g. a saddle in a comfortable manner, thereby reducing the chafing of the body and increasing the adhesion of the body to the saddle. Furthermore, moisture is transported towards the most outer foam-like member, comprising EVAPOR foam which is super breathable, vaporises the moisture and optimizes ventilation.

BACKGROUND TO THE INVENTION

[0003] Many athletes wear special clothing that are constructed for durability and comfort when practicing sport.

[0004] In cycling, for instance, cyclists often wear special cycling pants comprising an inner pad in the crotch and buttocks region, also known as the chamois. The main goals of the chamois of cycling pants are to fit the buttocks to the saddle in a comfortable manner, thereby reducing the chafing of the body, and to absorb moisture generated during sports practice.

[0005] In the early days, the chamois was placed in the pants without any point of attachment. Later, several pieces of material, each configured to conform to a portion of the body, were joined by stitching. Patent US4805243 for instance, describes synthetic foam pads, whereas Patent IT1235265A uses a flat, shaped element in gel polymer.

[0006] In the last decennia, cycling shorts have become more advanced, comprising different layers with specific functions.

[0007] U.S. Patent 4961233 provides a two-layer, one-piece, heat-formed, and seamless chamois that includes an inner liner imparting chaffing abrasion resistance and made of a synthetic leather-like material, and an outer synthetic fleece member that is compressible imparting cushioning. The inner liner and the synthetic fleece are adhesive bonded.

[0008] U.S. Patent 5271101 provides cycling shorts that include a padded, three-layer, seat liner having a plurality of embossed break lines specifically positioned such that the liner conforms to the anatomical profile of a cyclist who is positioned in a riding position on a bicycle. The liner is stitched or laminated to a body portion of the cycling pants. The embossed break lines are formed without using stitching or sewn seams by heat moulding

the seat liner in a flat position.

[0009] U.S. Patent 4945571 provides bicycling shorts having a liquid-filled cushion for cushioning the rider thighs and buttocks, the cushion having a plurality of layers of material to facilitate perspiration wickage. The liquid cushions include overlying layers of a polyurethane material and water, non-freezable silicon or glycerin or mixtures thereof, oils or other slippery material. WO2003037059 describes a chamois comprising a first cloth-like member of synthetic leather and a second cloth-like member of non-woven interfacing or a polyester-like batting. US6817037 describes a pair of stretchable athletic pants comprising one or more panels attached together by one or more seams to form the pants in which at least one of the seams comprises an overlapping bonded seam.

[0010] US2005066423 provides cycling shorts comprising a layered chamois wherein the chamois comprises: a top layer suitable for accepting graphics and providing breath-ability; a cushion layer for providing comfort for a cyclist; and a bottom layer for providing a mate to the top layer so as to enclose the second layer.

[0011] US7707659 provides a multi-layer pad for bicycling shorts, comprising two distinct layers with a continuous foam layer located between the first cloth layer and the second cloth layer and contacting the first cloth layer and the second cloth layer.

[0012] These inventions all have one characteristic in common, the chamois and paddings are located inside the pants. DE102008034496 also has a small area located outside the cycling pants, as it provides cycling shorts with a back layer which has an internal and external surface. WO2002024013 describes a seating element for a pair cyclist pants, whereby only the adhesive coating is located on the outside.

[0013] In great contrast with all of these mentioned inventions, our invention however, describes a chamois which is fully located on the exterior side of the sport pants, making it unique among its kind.

SUMMARY OF THE INVENTION

[0014] In general, the present invention describes sport pants with an externally located chamois. Surprisingly, and in great contrast with other sport pants, the chamois is located onto the sport pants, preferably near the crotch and buttocks region. The sport pants are preferably made of an elastic material such as Lycra, Lycra Polyester, Sport Lycra, Spandex, Elastane, polyester-polyurethane copolymer and can be used in different sports.

[0015] The externally located chamois comprises at least two different layers, in a preferred embodiment three layers, each layer consisting of a different foam with a different density. In a certain embodiment, foams are made of polyurethane and density lies in a range of 20-120kg/m³.

[0016] The externally located chamois is separated

from the body by a protective layer. This layer, made of microfibers and with an antibacterial coating, transfers the moisture towards the chamois and protects the skin from friction and inflammation.

[0017] The inner foam-like member is located closest to the protective layer and has a top and bottom surface, in which the bottom surface is oriented towards the user (i.e. protective layer) and the top surface is oriented away from the user (e.g. towards the saddle), being formed in a shape that provides an enlarged area covering the complete contact zone of the user with the seating area (e.g. saddle). Furthermore, in a preferred embodiment the inner foam-like member has a wide rear part and a narrow front part.

[0018] The outer foam-like member is located most far away from the body (i.e. protective layer) and has a top and bottom surface in which the bottom surface is oriented towards the user and the top surface is oriented away from the user (e.g. towards the saddle); located on the top surface of the inner foam-like member thereby covering a smaller area than the inner foam-like member. In one embodiment and -although externally located- being formed in a shape that provides two distinct areas for association with each buttock region onto which a certain force is exerted (e.g. the force exerted by a saddle of a cycling bike). Preferably each of said distinct areas has a wide rear part and a narrow front part. In a preferred embodiment, the outer foam-like member is made of reticulated EVAPOR foam, a 3D webbing that reacts differently to vibration and compression and that will rubberize upon impact, thereby creating a shock absorbing layer.

[0019] In a preferred embodiment, an intermediate foam-like member is located between the inner and outer foam-like members. The intermediate foam-like member has a top and bottom surface in which the bottom surface is oriented towards the user and the top surface is oriented away from the user (e.g. towards the saddle); located on the top surface of the inner foam-like member thereby covering a smaller area than the inner foam-like member but a larger area than the outer foam-like member. In one embodiment, and -although externally located- being formed in a shape that provides one area for association with the thighs and buttocks of the individual. Furthermore, in a preferred embodiment the intermediate foam-like member has a wide rear part and a narrow front part.

[0020] In a certain embodiment, the different foam-like members comprise certain cut-outs, which are generally gender specific cut-outs, increasing the comfort based on the anatomical differences between males and females.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] With specific reference now to the figures, it is stressed that the particulars shown are by way of example and for purposes of illustrative discussion of the dif-

ferent embodiments of the present invention only. They are presented in the cause of providing what is believed to be the most useful and readily description of the principles and conceptual aspects of the invention. In this regard no attempt is made to show structural details of the invention in more detail than is necessary for a fundamental understanding of the invention. The description taken with the drawings making apparent to those skilled in the art how the several forms of the invention may be embodied in practice.

Fig. 1: Composition of the externally located chamois (stitched onto the sport outfit), comprising an inner foam-like member (foam A, density X), an intermediate foam-like member (foam B, density Y) and an outer foam-like member (foam C, density Z). In a preferred embodiment, foam C consists of EVAPOR foam. The bottom layer of the inner foam-like member comprises a protective layer.

Fig. 2: Composition of the externally located chamois, seen from above, with the different foam layers (A, B and C). Smart cut outs of the different foam-like members deliver support on specific areas.

Fig. 3: Front (A) and back (B) view of the outside of the sport pants

Fig. 4: Front (A) and back (B) view of the inside of the sport pants

Fig. 5: Contact between the padding and the saddle in different views (A: under, B: right side, C: left side).

Fig. 6: Gender-specific cut-outs (A: male, B: female)

DETAILED DESCRIPTION OF THE INVENTION

[0022] A lot of sports, especially those sports that involve seating of the body, exert continuous pressure on the seating area of the athlete (e.g. cycling, equestrianism, motorsports, rowing, ...). The main problem for the athlete is the fact that during races or training the crotch and buttocks are subjected to unceasing stresses, since such part of the body is in continuous contact with the seating area (e.g. saddle) and thus is subject to shocks and vibrations of different kinds. Accordingly, localized reddening can be acquired which can degenerate into cuts or blisters which make it difficult if not impossible to practice the sport.

[0023] Partial or full relief can be obtained by the placement of one or more inner pads in the crotch and buttocks region, also known as the chamois. The chamois increases the comfort level of the athlete, thereby reducing the chafing of the body. Furthermore, moisture is absorbed by the chamois.

Surprisingly, and in great contrast with other sport pants, the present invention describes sport pants with an ex-

ternally located chamois, preferably near the crotch and buttocks region. The sport pants are preferably made of an elastic material such as Lycra, Lycra Polyester, Sport Lycra, Spandex, Elastane, polyester-polyurethane copolymer and can be used in different sports.

[0024] The externally located chamois comprises at least two different layers, in a preferred embodiment three layers, each layer consisting of a different foam with a different density (figure 1). In a certain embodiment, foams are made of polyurethane and density lies in a range of 20-150kg/m³. In one embodiment the density of the different layers is the same. In another embodiment the density of the layers is different. In another embodiment the density increases away from the user. In a particular embodiment the density of the inner foam like member is in the range of 20-120kg/m³, and the density of the outer foam like member is in the range of 60-150kg/m³. In another particular embodiment the density of the inner foam like member is in the range of 20-80kg/m³, the density of the intermediate foam like member is in the range of 40-100kg/m³, and the density of the outer foam like member is in the range of 70-150kg/m³. In a particular embodiment the density of the inner foam like member is in the range of 20-40kg/m³, the density of the intermediate foam like member is in the range of 40-70kg/m³, and the density of the outer foam like member is in the range of 70-130kg/m³. The combination of these foam-like members creates a blend of performance that is 1/3 of the mass and thickness of a regular high density perforated foam. In different sports, these characteristics optimize the comfort of the individual wearing the sport pants and increase the adhesion of the body to the saddle. In cycling for instance, the centre of gravity is lower, causing better cornering and more stable rides. In a certain embodiment, the different foam-like members comprise certain cut-outs (figure 2 and 6), thereby delivering support to specific areas and/or preventing pressure in certain areas. In most cases, these cut-outs are gender-specific cut-outs, increasing the comfort based on the anatomical differences between males and females.

During exercise, when pressure onto the chamois is exerted, the chamois and the foam-like members in particular retain their original shape (i.e. the shape before exercise started), causing shocks to be absorbed in an equal manner during exercise thereby generating a stable quality performance, which can be considered a big advantage for the user, as most sport pants available do not have this option.

[0025] The externally located chamois is separated from the body by a protective layer. This layer, made of microfibers and with an antibacterial coating, transfers the moisture towards the chamois and protects the skin from friction and inflammation. The protective layer is the primary connection site (by bonding or stitching) with the rest of the outfit.

[0026] The inner foam-like member is located closest to the protective layer and has a top and bottom surface,

in which the bottom surface is oriented towards the user (i.e. protective layer) and the top surface is oriented away from the user (e.g. towards the saddle), being formed in a shape that provides an enlarged area covering the complete contact zone of the user with the seating area (e.g. saddle). Furthermore, in one embodiment the inner foam-like member has a wide rear part and a narrow front part. The inner foam-like member provides a thickness and density to support certain areas, thereby transporting the evaporated moisture generated during sports practice. As mentioned hereinbefore, the inner foam-like member has a density in the range of 20-120 kg/m³; in particular in the range of 20-80 kg/m³; more in particular in the range of 20-40 kg/m³; even more in particular a density of about 20 kg/m³.

[0027] Preferably, the water vapor permeability of the foam-like members is greater than 1250 g/m²/24h. The water vapor permeability of the foam-like members of the chamois is measured at 37.8°C using the ASTM-E96-66 standard. In particular, the water vapor permeability of the foam-like members is greater than 3000 g/m²/24h, more particularly greater than 5000 g/m²/24h and most particularly the water vapor permeability of the foam-like members is greater than 10 000 g/m²/24h.

[0028] The outer foam-like member is located most far away from the body (i.e. protective layer) and has a top and bottom surface in which the bottom surface is oriented towards the user and the top surface is oriented away from the user (e.g. towards the saddle); located on the top surface of the inner foam-like member thereby covering a smaller area than the inner foam-like member. In one embodiment and -although externally located- being formed in a shape that provides two distinct areas for association with each buttock region onto which a certain force is exerted (e.g. the force exerted by a saddle during cycling). In a particular embodiment each distinct area has a wide rear part and a narrow front part. In a preferred embodiment, the outer foam-like member is made of reticulated polyurethane foam having a density in the range of 60-150 kg/m³ and a porosity in the range of 10-90 Pores Per Inch (PPI); in particular a reticulated polyurethane foam having a density in the range of 70-150 kg/m³ and a porosity in the range of 40-90 Pores Per Inch (PPI); more in particular a reticulated polyurethane foam having a density in the range of 70-130 kg/m³ and a porosity in the range of 70-90 Pores Per Inch (PPI); even more in particular a reticulated foam having a density of about 70-90 kg/m³, herein also referred to as EVAPOR foam, a 3D webbing that reacts differently to vibration and compression and that will rubberize upon impact, thereby creating a shock absorbing layer. As a result, the 3D webbing material creates high friction on the seating area (e.g. saddle), causing a more stable and supportive ride. Because EVAPOR in his origin is a very rigid and rather hard material, when used as outer foam-like member at least one further foam-like member (inner) and preferably two further foam-like members (inner and intermediate) with a lower density have to be present.

Furthermore, EVAPOR foam is super breathable, vaporises the moisture and optimizes the ventilation of the sport pants.

[0029] Hence, in a preferred embodiment, an intermediate foam-like member is located between the inner and outer foam-like members. The intermediate foam-like member has a top and bottom surface in which the bottom surface is oriented towards the user and the top surface is oriented away from the user (e.g. towards the saddle); located on the top surface of the inner foam-like member thereby covering a smaller area than the inner foam-like member but a larger area than the outer foam-like member. In one embodiment and -although externally located- being formed in a shape that provides one area for association with the thighs and buttocks of the individual. Furthermore, in a particular embodiment the intermediate foam-like member has a wide rear part and a narrow front part. The intermediate foam-like member provides a thickness and density to support certain areas, thereby transporting the evaporated moisture generated during sports practice towards the outer foam-like member. As mentioned hereinbefore, the intermediate foam-like member has a density in the range of 20-120 kg/m³; in particular in the range of 40-100 kg/m³; more in particular in the range of 40-70 kg/m³; even more in particular a density of about 40 kg/m³.

[0030] In conclusion, this invention generally relates to sport pants with an externally located chamois, whereby the chamois comprises at least two layers, preferably three layers, whereby the chamois is separated from the body by a protective layer. The sport pants are designed with specialised cut-outs, both for male and female cyclists.

[0031] The chamois is preferably located near the crotch and buttocks region, and is designed in a way that it conforms the anatomical figure of the athlete, i.e. being able to fit the buttocks to e.g. a saddle in a comfortable manner, thereby reducing the chafing of the body and increasing the adhesion of the body to the saddle. Furthermore, moisture is transported towards the most outer foam-like member, comprising EVAPOR foam which is super breathable, vaporises the moisture and optimizes ventilation.

Claims

1. Sport pants comprising an externally located chamois.
2. The chamois according to claim 1, comprising at least two different layers.
3. The chamois according to claim 1 and 2, comprising an inner foam-like member having a top and a bottom surface, and being formed in a shape that provides an enlarged area covering the complete contact zone of a user with a seating area.

4. The chamois according to claim 3, whereby the bottom surface of the inner foam-like member comprises a protective layer.
5. The chamois according to previous claims, comprising an outer foam-like member having a top and bottom surface; located on the top surface of the inner foam-like member and being formed in a shape that provides two distinct areas for association with each buttock region.
6. The chamois according to previous claims, comprising an intermediate foam-like member having a top and bottom surface; located between the top surface of the inner foam-like member and the bottom surface of the outer foam like member and being formed in a shape that provides one area for association with the thighs and buttocks of the individual.
7. The chamois according to previous claims, whereby the different foam-like members comprise certain cut outs.
8. The chamois according to previous claims, whereby the different foam-like members have different densities.
9. The chamois according to previous claims, whereby each foam-like member has a wide rear part and a narrow front part.
10. The chamois according to claim 5, whereby the outer foam-like member is made of reticulated EVAPOR foam.

Fig. 1

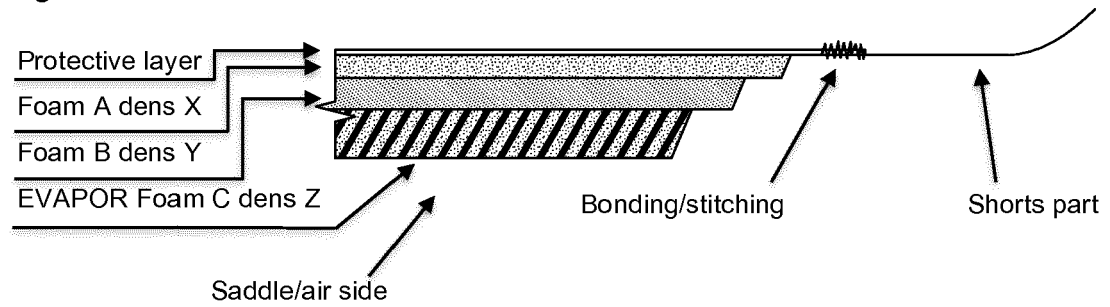


Fig. 2

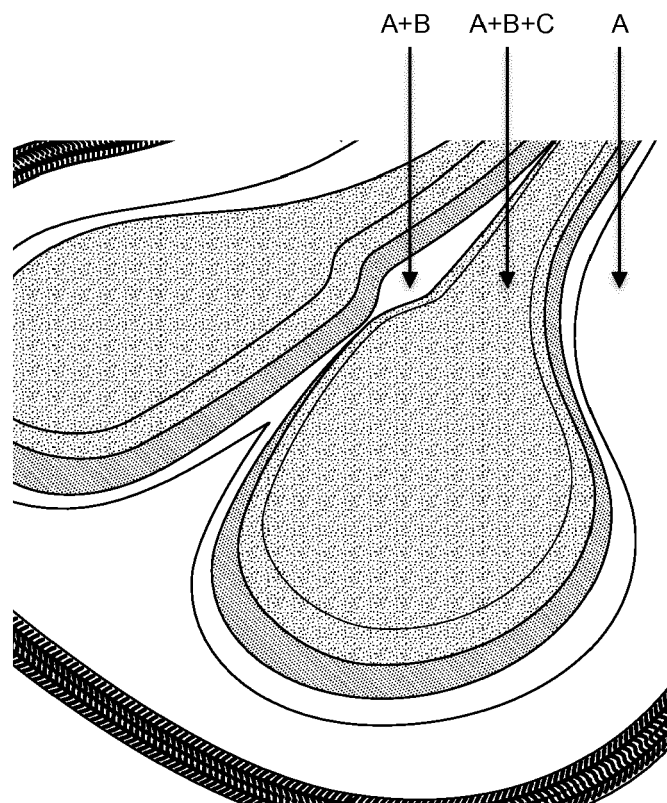
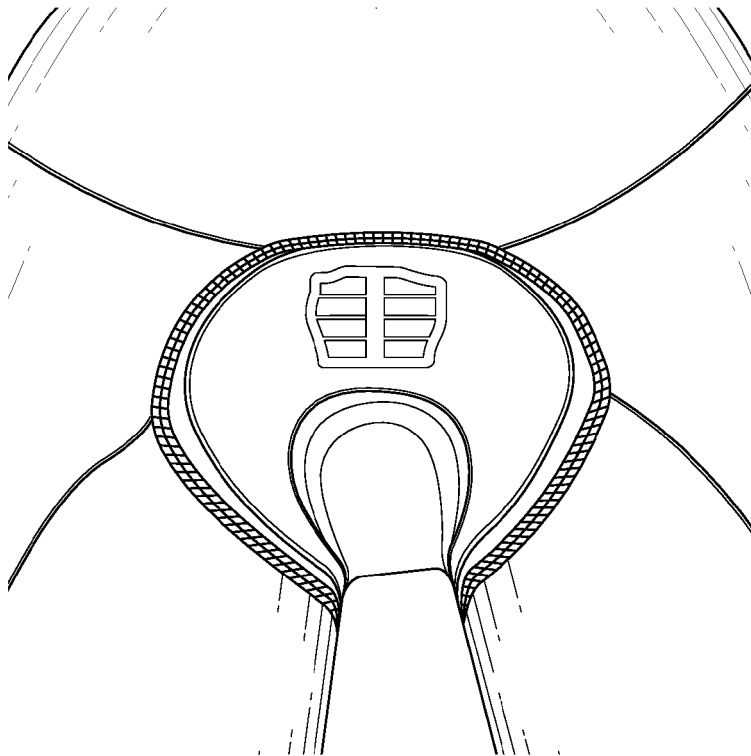
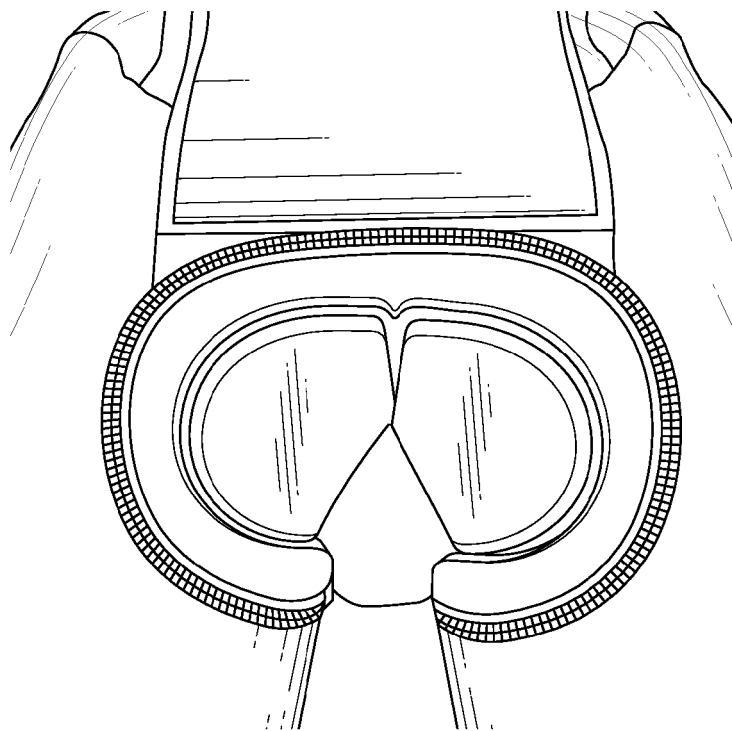


Fig. 3

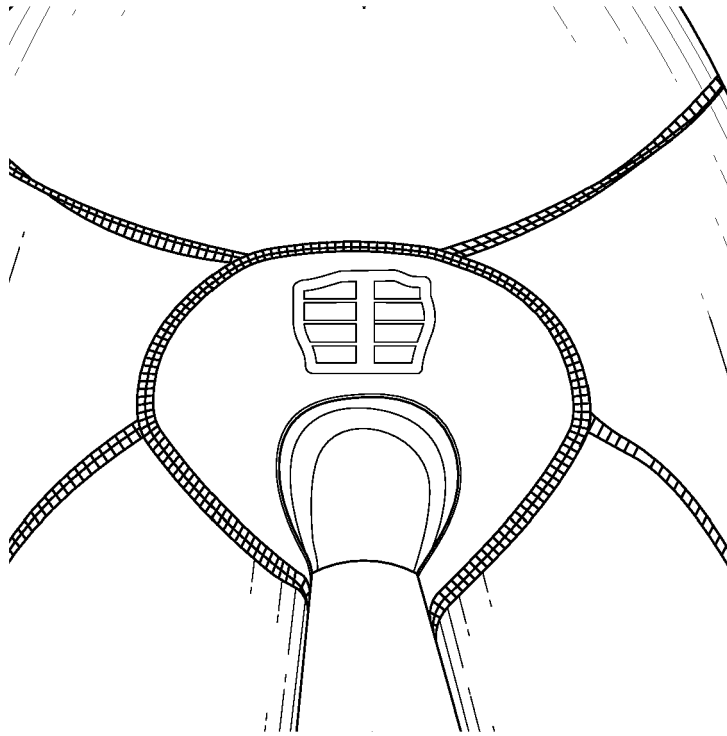


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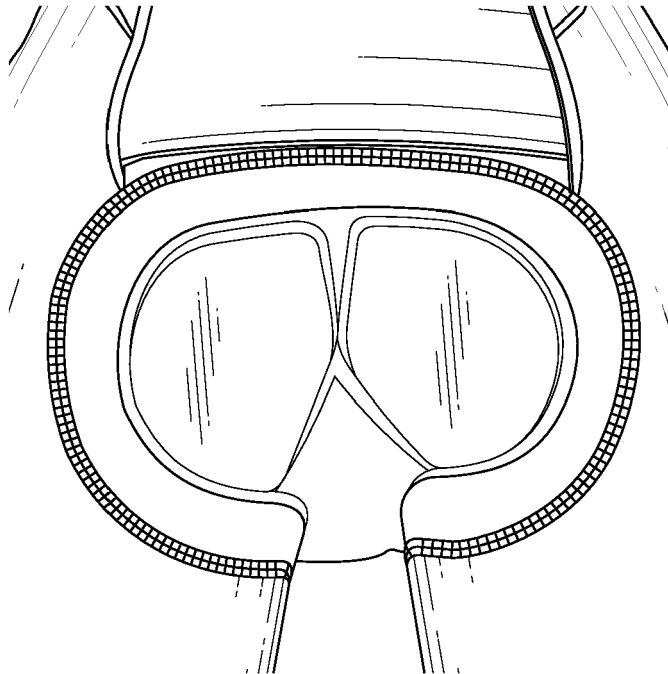


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Fig. 4

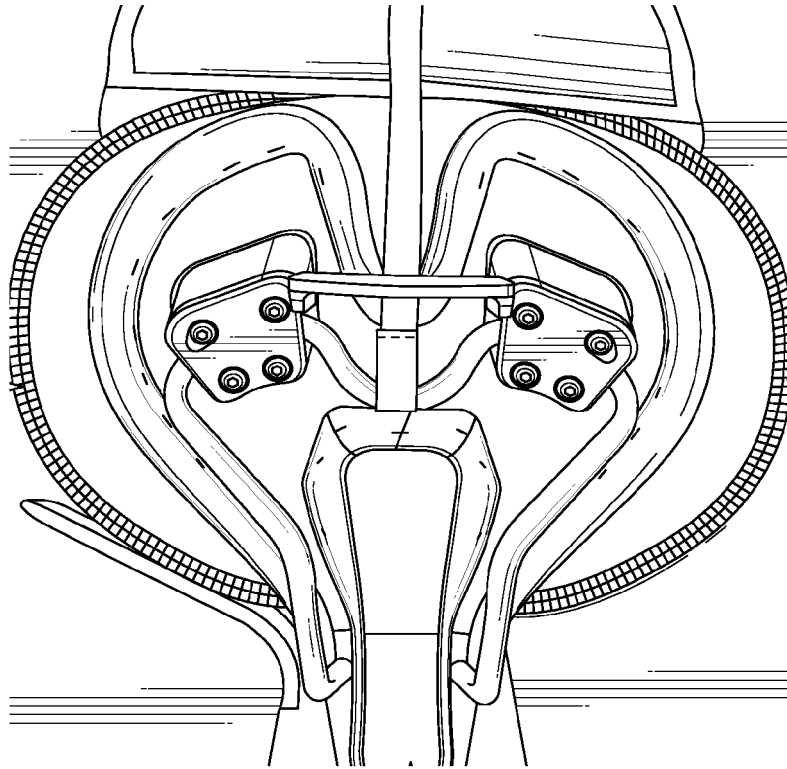


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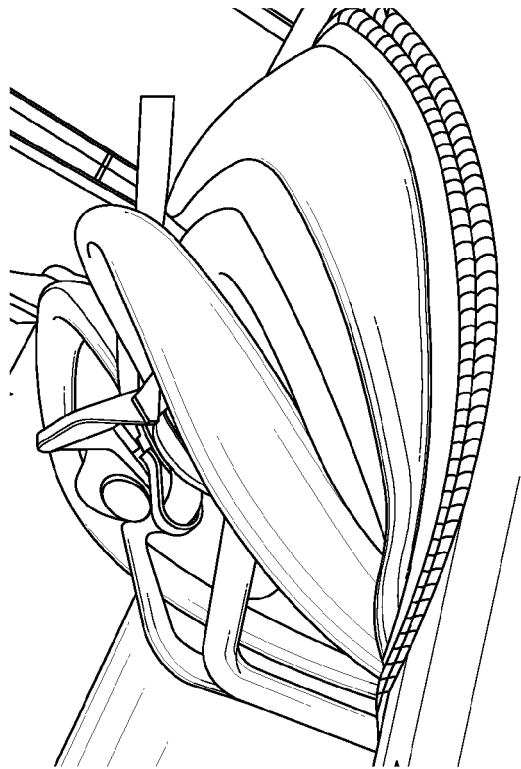


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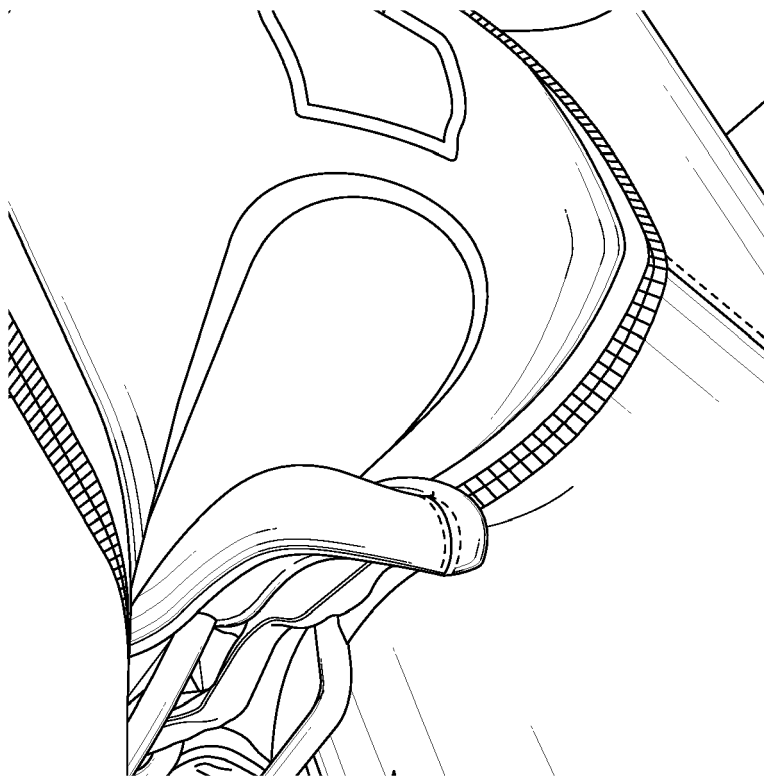
Fig. 5



A

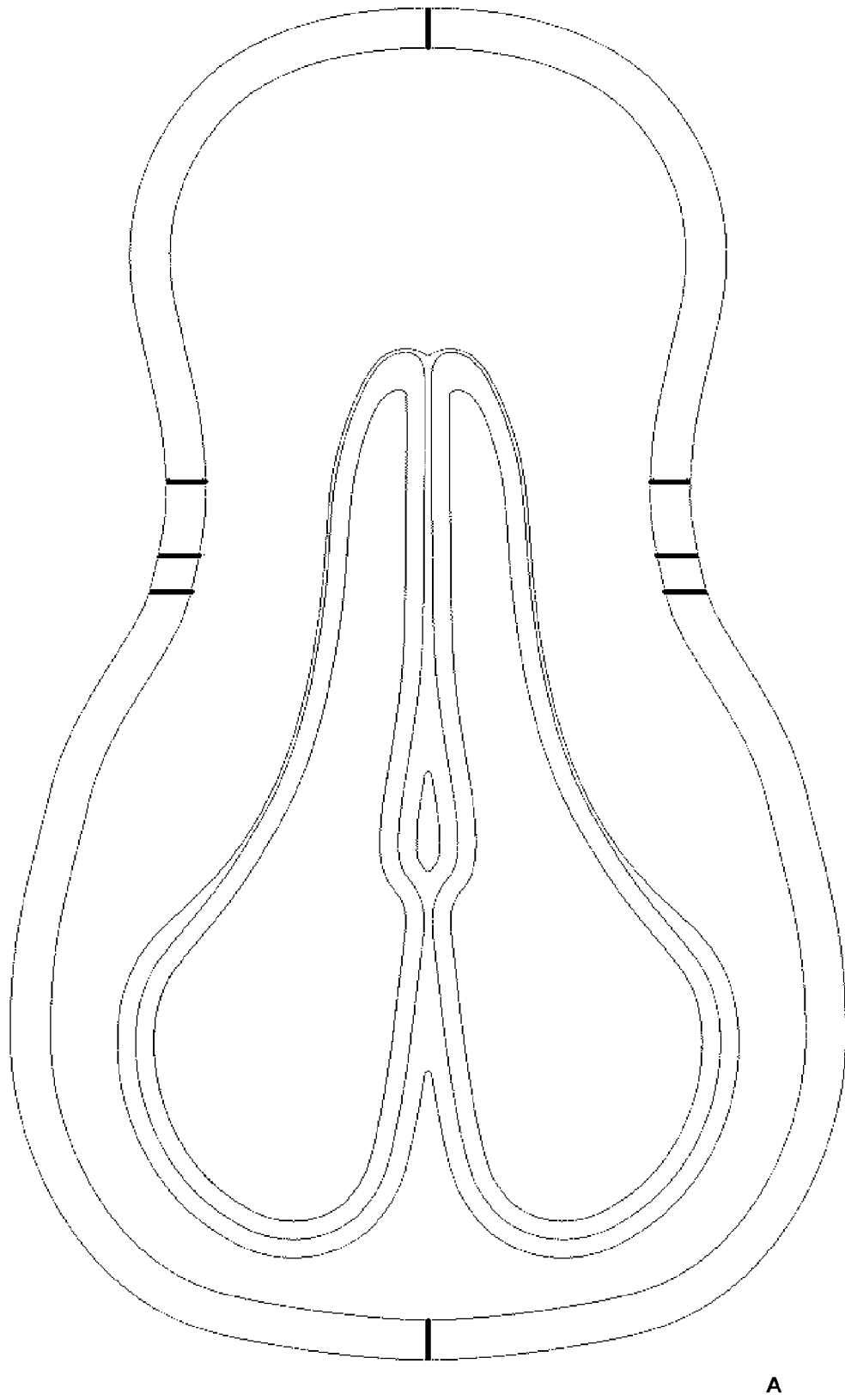


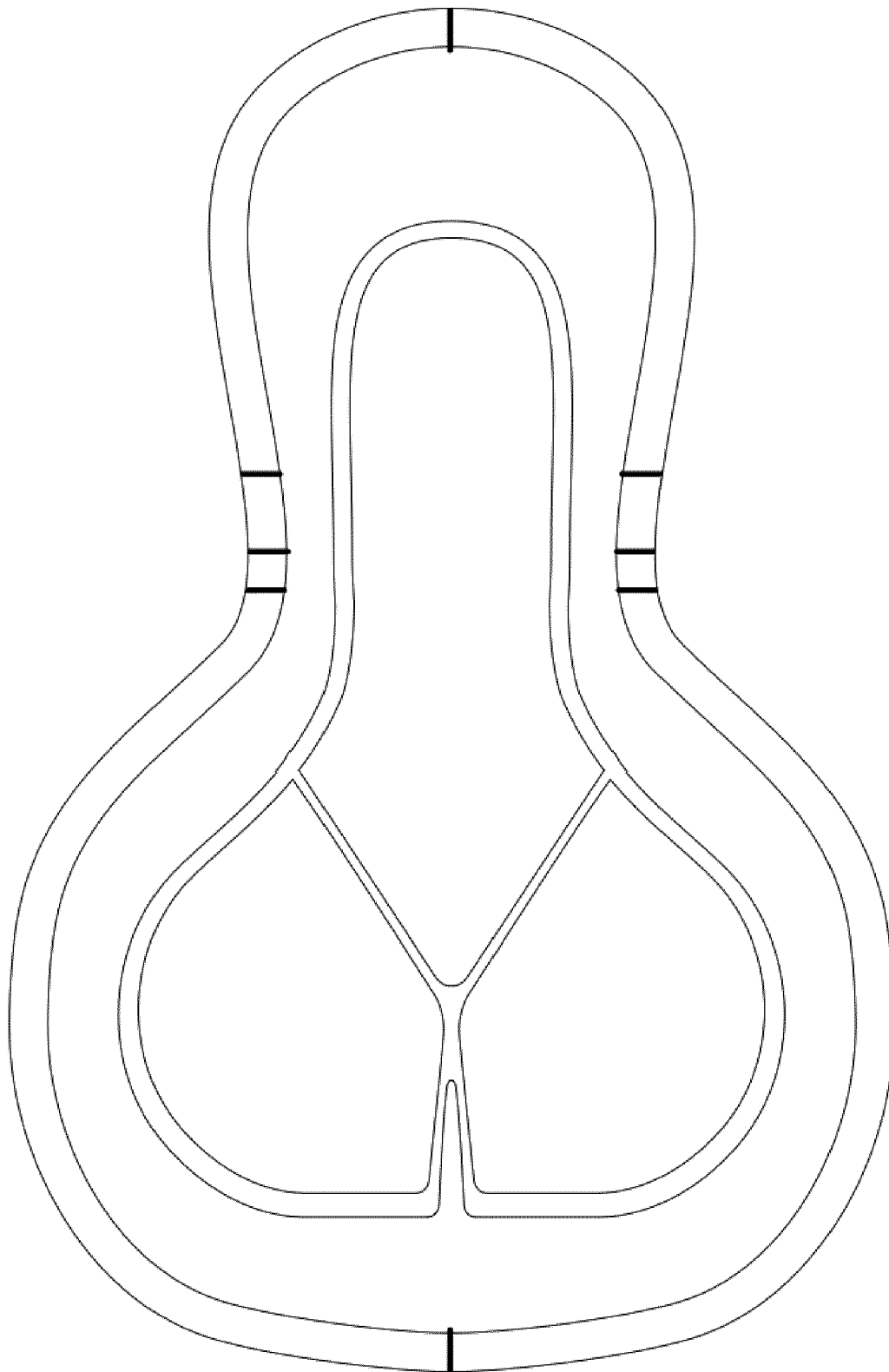
B



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Fig. 6





B



EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
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X	US 2005/009446 A1 (ARNOLD FRANC [DE]) 13 January 2005 (2005-01-13) * paragraph [0039]; figures 1,4 *	1-3,5,7, 8,10 4,6,9	
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			TECHNICAL FIELDS SEARCHED (IPC)
			A41D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 23 February 2017	Examiner Simpson, Estelle
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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23-02-2017

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