



- (51) International Patent Classification:  
*B68C 1/02* (2006.01)
- (21) International Application Number:  
PCT/IB2014/062587
- (22) International Filing Date:  
25 June 2014 (25.06.2014)
- (25) Filing Language: Italian
- (26) Publication Language: English
- (30) Priority Data:  
VI2013A000163 26 June 2013 (26.06.2013) IT
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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

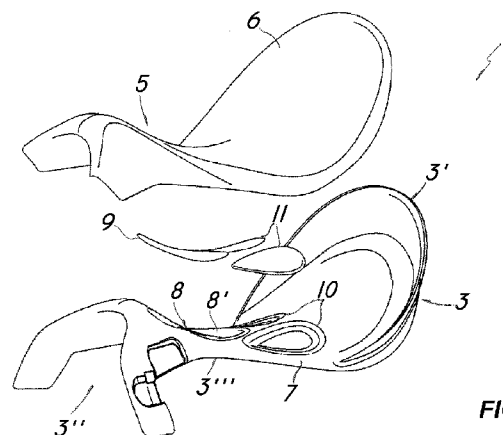
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- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, 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, CL, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

**Published:**

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

(54) Title: ERGONOMIC TREE STRUCTURE FOR AN EQUESTRIAN SADDLE AND EQUESTRIAN SADDLE COMPRISING SUCH STRUCTURE



**FIG. 2**

(57) Abstract: An ergonomic tree structure (1) for an equestrian saddle (2) comprising a load-bearing element (3) made of a relatively rigid material, defining a longitudinal axis (L) and having a bottom surface (4) designed for contact with the back of an equine and a top surface (7) facing toward the user, as well as a cover element (5) made of a relatively elastic material, which is adapted to be coupled to the load-bearing element (3) and whose plan shape is substantially similar to that of the latter, with a top surface (6) defining a seat. The load-bearing element (3) has at least one receptacle (8) on the top surface (7), axially located at the genital or crotch area of the user, which is designed to receive at least one first shock-absorbing insert (9) made of an at least partially elastically deformable first material, for damping vibrations and impacts directed substantially perpendicular to said top surface (7).



## **ERGONOMIC TREE STRUCTURE FOR AN EQUESTRIAN SADDLE AND EQUESTRIAN SADDLE COMPRISING SUCH STRUCTURE**

### Field of the Invention

**[0001]** The present invention generally finds application in the field of  
5 equine tack elements and particularly relates to a tree structure for an  
equestrian saddle.

**[0002]** The invention also relates to an equestrian saddle comprising such  
tree structure.

### Background Art

10 **[0003]** In the field of animal tack elements, saddles are known to be used,  
which are designed to be placed on the back of a horse, a donkey, a mule or  
an equine in general, for a user to sit as he/she rides.

**[0004]** Saddles comprise a tree with a generally rigid load-bearing element  
having a resilient cover element mounted thereto to define a seat for the  
15 rider.

**[0005]** Due to the provision of the rigid tree the saddle may be designed to  
keep the user in the right posture as he/she rides the equine and to partially  
absorb the stresses he/she experiences during riding.

**[0006]** In view of obviating this drawback, equestrian saddles were  
20 designed with devices for attenuating the vertical stresses experienced by  
the user, to reduce the stress exerted at the saddle-contact regions of his/her  
body.

**[0007]** These devices are usually made of a resilient material such as  
rubber, felt, soft polyurethane, gel or the like and are usually received within  
25 the saddle where the rider is designed to sit.

**[0008]** For instance, US 6,370,849 discloses a saddle tree comprising a  
seat with a window which is designed to receive a rubber pad and a plurality  
of resilient layers which partially overlap the window. In this case, the  
damping effect is provided by the combined shock-absorbing action of the  
30 pad and the overlapping layers.

**[0009]** While this device reduces the stresses experienced by the rider, it

still has the drawback of not concentrating the damping effect on the parts of the user's body that mostly experience the riding stress.

**[0010]** Furthermore, the need for several distinct shock-absorbing layers in overlapped arrangement adds complexity to saddle assembly and contributes to weight increase. This will also increase fatigue for the saddled animal, especially when it is ridden for a long time.

**[0011]** On the other hand, US 6,434,916 discloses a saddle having a tree structure with a cover element removably laying over it, and having a pair of shock-absorbing pads covered with an upper padding layer.

**[0012]** These pads are particularly adapted to support the ischial bones of the rider thereby reducing the stresses that act upon the latter during riding.

**[0013]** A first drawback of this saddle is fact that a damping effect can be only obtained by covering the saddle frame with an adequate layer of resilient material.

**[0014]** Furthermore, this saddle requires the provision of a layer of specially designed pad-supporting material, which is not easily applied to the underlying tree and may disengage and/or move away therefrom during riding, thereby causing a loss of the damping effect on the particular anatomical region of the rider.

**[0015]** Disclosure of the invention

**[0015]** The object of the present invention is to overcome the above drawbacks, by providing a tree structure for an equestrian saddle that is highly efficient and relatively cost-effective.

**[0016]** A particular object of the present invention is to provide a tree structure for equestrian saddles that can concentrate its shock-absorbing effect at the regions of the user's body that mostly experience shocks during riding.

**[0017]** A further object of the present invention is to provide a tree structure for an equestrian saddle that has a small number of shock-absorbing inserts.

**[0018]** A further object of the present invention is to provide a tree

structure for an equestrian saddle that has a relatively low degree of complexity and can be easily mounted.

**[0019]** Yet another object of the present invention is to provide a tree structure for equestrian saddles that has a light weight and causes less  
5 fatigue to the animal during use.

**[0020]** Another important object of the present invention is to provide a tree structure for an equestrian saddle that can absorb the shocks experienced by the user even when it is used in a different configuration, corresponding to particular equine riding styles.

10 **[0021]** These and other objects, as better explained hereafter, are fulfilled by a tree structure for an equestrian saddle as defined in claim 1.

**[0022]** In another aspect, the invention relates to an equestrian saddle as defined in claim 14.

15 **[0023]** Advantageous embodiments of the invention are obtained in accordance with the dependent claims.

#### Brief Description of the Drawing

20 **[0024]** Further features and advantages of the invention will be more apparent from the detailed description of a preferred, non-exclusive embodiment of a frame structure and an equestrian saddle according to the invention, which is described as a non-limiting example with the help of the annexed drawings, in which:

**[0025]** FIG. 1 is a top view of the construction elements of the tree structure for an equestrian saddle according to the invention in a first configuration;

25 **[0026]** FIG. 2 is a partially exploded lateral perspective view of a tree structure for an equestrian saddle according to the invention;

**[0027]** FIG. 3 is a second partially exploded lateral perspective view of a tree structure of FIG. 1;

30 **[0028]** Fig. 4 is a top view of a tree structure according to the invention in a second configuration;

**[0029]** FIGS. 5A and 5B are partially sectional views of two respective

details of FIG. 4, as taken along the planes V-V and VI-VI;

**[0030]** FIG. 6 is a top view of the construction elements of the tree structure for an equestrian saddle according to the invention in a third configuration;

5 **[0031]** FIG. 7 is a partially exploded view of an equestrian saddle comprising the tree structure of Fig. 4.

Detailed description of a preferred embodiment

**[0032]** The above mentioned figures show a tree structure for equestrian saddles, generally designated by numeral 1, which is designed to be placed  
10 on the back of a horse, a donkey, a mule or an equine in generally, for a user to sit and ride thereon.

**[0033]** Particularly, this tree structure 1 is adapted to support the user in the right seated posture as he/she rides.

**[0034]** Furthermore, the tree structure 1 may be integrated into a plurality  
15 of saddles, as used for a plurality of equestrian disciplines. For example, the tree structure 1 may be adapted to English, Western, eventing, country, trekking or dressage riding styles.

**[0035]** As a rule, the tree structure 1 of the invention comprises a load-bearing element 3 made of a relatively rigid material, which has a bottom  
20 surface 4 designed for contact with the back of an equine, not shown, and a top surface 7 facing the user.

**[0036]** As is known per se, there is an enlarged back portion 3' defining the cantle, a narrower front portion 3" defining a fork or pommel and an  
25 intermediate portion 3''' which is narrower than the other two, defining the seat, which are smoothly connected to each other.

**[0037]** For simplicity a longitudinal axis L is determined, which extends across the three portions of the load-bearing structure 3, and ideally extends through the top of the pommel, said axis L being designed to ideally lie over the spine of the equine upon which the saddle 2 is designed to be placed.

30 **[0038]** The tree structure 1 further comprises a cover element 5 made of a relatively elastic material, whose plan shape is substantially similar to that of

the load-bearing element 3 and which is designed to lay over the latter to define by its top face 6 a seat for the user.

**[0039]** In a first embodiment, as shown in FIG. 1, a first blind receptacle 8 is formed on the top surface 7 of the load-bearing element 3, and is axially  
5 located substantially level to the genital or crotch area of the user. It shall be noted that the receptacle 8 is located proximate the intermediate portion 3'' of the load-bearing element 3, which is slightly inclined and tapered for easy positioning of the thighs of the user.

**[0040]** Preferably, the receptacle 8 has a substantially flat bottom 8' with a  
10 maximum depth  $h_1$  and a substantially polygonal rim 8'' with rounded corners. Preferably, the plan dimensions of the first receptacle 8 range from 80 mm to 150 mm, and the maximum depth  $h_1$  ranges from a few millimeters to a few centimeter.

**[0041]** Conveniently, the receptacle 8 is designed to receive at least one  
15 first insert 9 made of a first at least partially elastically deformable material, for damping vibrations and impacts in a direction V substantially perpendicular to the top surface 7.

**[0042]** Conveniently, the first insert 9 has a shape that is substantially  
20 complementary to that of the first receptacle 8, with the same plan shape and the maximum thickness  $s_1$  equal to or slightly greater than the maximum depth  $h_1$  of the first receptacle 8, with no step or projection being provided along the edge 8'' of the receptacle, that might affect user comfort.

**[0043]** In a second preferred embodiment of the invention, as shown in  
25 FIGS. 2 to 4, the load-bearing element 3 has a pair of substantially equally shaped second blind receptacles 10 on its top surface 7, which are arranged in substantially symmetric positions with respect to the longitudinal axis L.

**[0044]** Conveniently, the second receptacles 10 are longitudinally  
30 rearwardly offset from the first receptacle 8, proximate the rear portion 3' of the load-bearing element 3 and substantially level with the ischialtuberosities of the user.

**[0045]** The second receptacles 10 are designed to receive corresponding

second inserts 11 made of a second at least partially elastically deformable material, for damping the impacts and vibrations experienced by the user in the ischial area in a direction  $V'$  substantially perpendicular to the top surface 7 of the load-bearing element 3.

5 **[0046]** Preferably, the second receptacles 10 have a shape that is substantially equal to that of the first receptacle 8 excepting the peripheral edge 10' which is generally drop-shaped, to better conform to the anatomical configuration of the ischial tuberosities.

10 **[0047]** Particularly, the maximum depth  $h_2$  of the second receptacles is similar to the depth  $h_1$  of the first receptacles 8, whereas the second inserts 11 have a maximum thickness  $s_2$  equal to or slightly greater than the maximum depth  $h_2$  of the second receptacles 10 such that it may fill the whole of them, thereby avoiding the formation of steps or projections along the edge of the second receptacles 10, which would affect user comfort.

15 **[0048]** In a third preferred embodiment of the invention, as schematically shown in FIG. 6, the load-bearing element 3 has a substantially arched third blind receptacle 12 on its top surface 7.

20 **[0049]** Conveniently, the third receptacle 12 is formed in a substantially axial and longitudinally rearwardly offset position with respect to the second receptacles 10, proximate the rear portion 3' of the load-bearing element 3 and substantially level with the sacrococcygeal area of the user.

25 **[0050]** The third receptacle 12 is designed to receive at least one third insert 13 made of a third at least partially elastically deformable material, for damping vibrations and impacts in a direction  $V''$  substantially perpendicular to the top surface 7.

30 **[0051]** Also in this case, the third receptacle has a maximum depth  $h_3$  and the third insert 13 has a maximum thickness  $s_3$  equal to or slightly greater than the maximum depth  $h_3$  of the third receptacle 12 such that it may fill the whole of it, thereby avoiding the formation of steps or projections along the edge 12' of the receptacle itself, which would affect user comfort.

**[0052]** For example, FIG. 5A shows a first insert 9 whose maximum

thickness  $s_1$  matches the maximum height  $h_1$  of the first receptacle 8, whereas FIG. 5B shows a second insert 11 whose maximum thickness  $s_2$  is slightly greater than the maximum height  $h_2$  of the second receptacle 10.

**[0053]** This will allow damping of most perpendicular vibrations experienced by the user in the whole area of the pelvis-ischium-sacrum with a small number of shock-absorbing inserts 8, 11, 13 in the ischial-genital regions.

**[0054]** Advantageously, the first, second and third materials that form the inserts 9, 11, 13 may be selected from the group comprising polymeric materials.

**[0055]** Particularly, the first 9, second 11 and third 13 inserts may be made from a gel or a reduced-viscosity material.

**[0056]** Furthermore, the first, second and third materials may be equal and selected from the group comprising soft polyurethane.

**[0057]** Conveniently, the first 9, second 11 and third 13 inserts may be formed from a shape-memory material which is adapted to be restored to its initial shape and size upon being subjected to a stress.

**[0058]** Preferably, the load-bearing element 3 may be formed from a polymeric material preferably selected from the group comprising synthetic materials.

**[0059]** Conveniently, the cover element 5 may be also formed from a polymeric material, and particularly from a polymeric material selected from the group comprising polyurethane foam.

**[0060]** The use of a synthetic material, polyurethane foam and soft polyurethane for making the load-bearing element 3, the cover element 5 and the first 9, second 11 and third 13 inserts respectively will impart predetermined mechanical properties to the tree structure 1.

**[0061]** Particularly, the use of such materials will provide a tree structure 1 that has, according to the standard *ISO 527 Type 1 A*, an elastic modulus ranging from 7000MPa to 8000MPa, preferably of about 7500 MPa, an elongation at fracture ranging from 4% to 7%, preferably of about 6% and a

tensile strength ranging from 120MPa to 150MPa, preferably of about 135MPa.

**[0062]** Furthermore, the use of such materials provides a tree structure 1 that has, according to the standard *ISO 178*, a flexural modulus ranging from  
5 5500 MPa to 7200MPa and preferably of about 6400MPa and a maximum flexural stress ranging from 160MPa to 200MPa, preferably of about 185MPa.

**[0063]** According to a further aspect of the invention, as shown in FIG. 7, an equestrian saddle 2 is provided, which comprises the tree structure 1 as  
10 described above and a plurality of accessory elements 14, 15, 16 associated with such tree structure 1.

**[0064]** Particularly, as clearly shown in the exploded view of FIG. 7, the saddle 2 may comprise a first accessory element 4 interposed between the back of the horse and the tree structure 1 to avoid any direct contact of the  
15 latter with the back of the animal.

**[0065]** A pair of substantially sheet-like second accessory elements 15 commonly known as *underflaps*, are connected to the first accessory 14 for preventing direct contact of the user's legs with the sides of the animal. Also, a pair of third accessory elements 16, known as *flaps* are generally provided  
20 above the second accessory elements 15.

**[0066]** Conveniently, the accessory elements 14, 15, 16 may be designed to form an equestrian saddle 2 that can fit different riding styles.

**[0067]** For example, the accessory elements 14, 15, 16 may be adapted to form a saddle for English riding, American or classical riding, for eventing,  
25 trekking, country or dressage.

**[0068]** The tree structure and equestrian saddle of the invention are susceptible of a number of changes and variants, within the inventive concept disclosed in the appended claims. All the details thereof may be replaced by other technically equivalent parts, and the materials may vary  
30 depending on different needs, without departure from the scope of the invention.

**[0069]** While the tree structure and equestrian saddle have been described with particular reference to the accompanying figures, the numerals are only used for the sake of a better intelligibility of the invention and shall not be intended to limit the claimed scope in any manner.

5

Industrial applicability

**[0070]** The present invention finds industrial application in the manufacture of animal tack elements, particularly equine tack elements.

## CLAIMS

1. An ergonomic tree structure (1) for an equestrian saddle (2), comprising:

- a load-bearing element (3) made of a relatively rigid material, defining a longitudinal axis (L) and having a bottom surface (4) designed for contact with the back of an equine and a top surface (7) facing toward the user;

- a cover element (5) made of a relatively elastic material, which is adapted to be coupled to said load-bearing element (3) and whose plan shape is substantially similar to that of the latter, with a top surface (6) defining a seat for the user;

wherein said load-bearing element (3) has at least one first receptacle (8) on said top surface (7), located at the genital or crotch area of the user, said at least one first receptacle (8) being adapted to receive at least one shock-absorbing insert (9) made of an at least partially elastically deformable first material, for damping vibrations and impacts in a direction (V) substantially perpendicular to said top surface (7),

characterized in that said load-bearing element (3) further has, on said top surface (7), at least one pair of second receptacles (10) in substantially symmetrical positions with respect to said longitudinal axis (L) and longitudinally rearwardly offset from said first receptacle (8), substantially in correspondence of the ischialtuberosities of the user, said at least one first receptacle (8) and said second receptacles (10) being blind, said second receptacles (10) being adapted to receive corresponding second inserts (9) made of an at least partially elastically deformable second material, for damping vibrations and impacts in a direction (V') substantially perpendicular to said top surface (7).

2. A tree structure as claimed in claim 1, characterized in that said load-bearing element (3) has, on said top surface (7), a third receptacle (12), which is also blind, and is axially located in a longitudinally rearwardly offset position with respect to said pair of second receptacles (10) in

correspondence of the sacrococcygeal areas of the user.

3. A tree structure as claimed in claim 2, characterized in that said third blind receptacle (12) is adapted to receive a third shock-absorbing insert (13) made of an at least partially elastically deformable third material, for  
5 damping vibration and impacts in a direction ( $V''$ ) substantially perpendicular to said top surface (7).

4. A tree structure as claimed in claim 1, characterized in that said first receptacle (8) and said first insert (9) have a substantially polygonal shape with rounded corners.

10 5. A tree structure as claimed in claim 1, characterized in that said first receptacle (8) has a substantially flat bottom (8').

6. A tree structure as claimed in claim 1, characterized in that said second receptacles (10) and said second inserts (11) have a substantially drop-like plan shape.

15 7. A tree structure as claimed in claim 3, characterized in that said third receptacle (12) and said third insert (13) have a substantially curved or crescent shape.

8. A tree structure as claimed in claims 1 to 3, characterized in that said first insert (9), said second inserts (11) and said third insert (13) are  
20 shaped to be substantially complementary to said first receptacle (8), said second receptacles (10) and said third receptacle (12).

9. A tree structure as claimed in claims 1 to 3, characterized in that said first insert (9), said second inserts (11) and said third insert (13) have maximum thicknesses ( $s_1, s_2, s_3$ ) that are equal to or slightly greater than the  
25 maximum depths ( $h_1, h_2, h_3$ ) of said first receptacle (8), said second receptacles (10) and said third receptacle (12).

10. A tree structure as claimed in claims 1 to 3, characterized in that said first, second and third at least partially elastically deformable materials are polymeric materials.

30 11. A tree structure as claimed in claim 10, characterized in that said first and said second at least partially elastically materials are equal and

selected from the group comprising soft polyurethane and gels.

12. A tree structure as claimed in claim 1, characterized in that said cover element (5) is made of a polymeric material selected from the group comprising polyurethane foam.

5 13. A tree structure as claimed in claim 1, characterized in that said load-bearing element (3) is made of a polymeric material selected from the group comprising synthetic materials.

10 14. An equestrian saddle (2) comprising a tree structure (1) and a plurality of accessory elements (14, 15, 16) associated with said tree structure, characterized in that said tree structure (1) is as claimed in one or more of the preceding claims and in that said accessories (14, 15, 16) are configured for English, Western, trekking, eventing, country riding styles and the like.

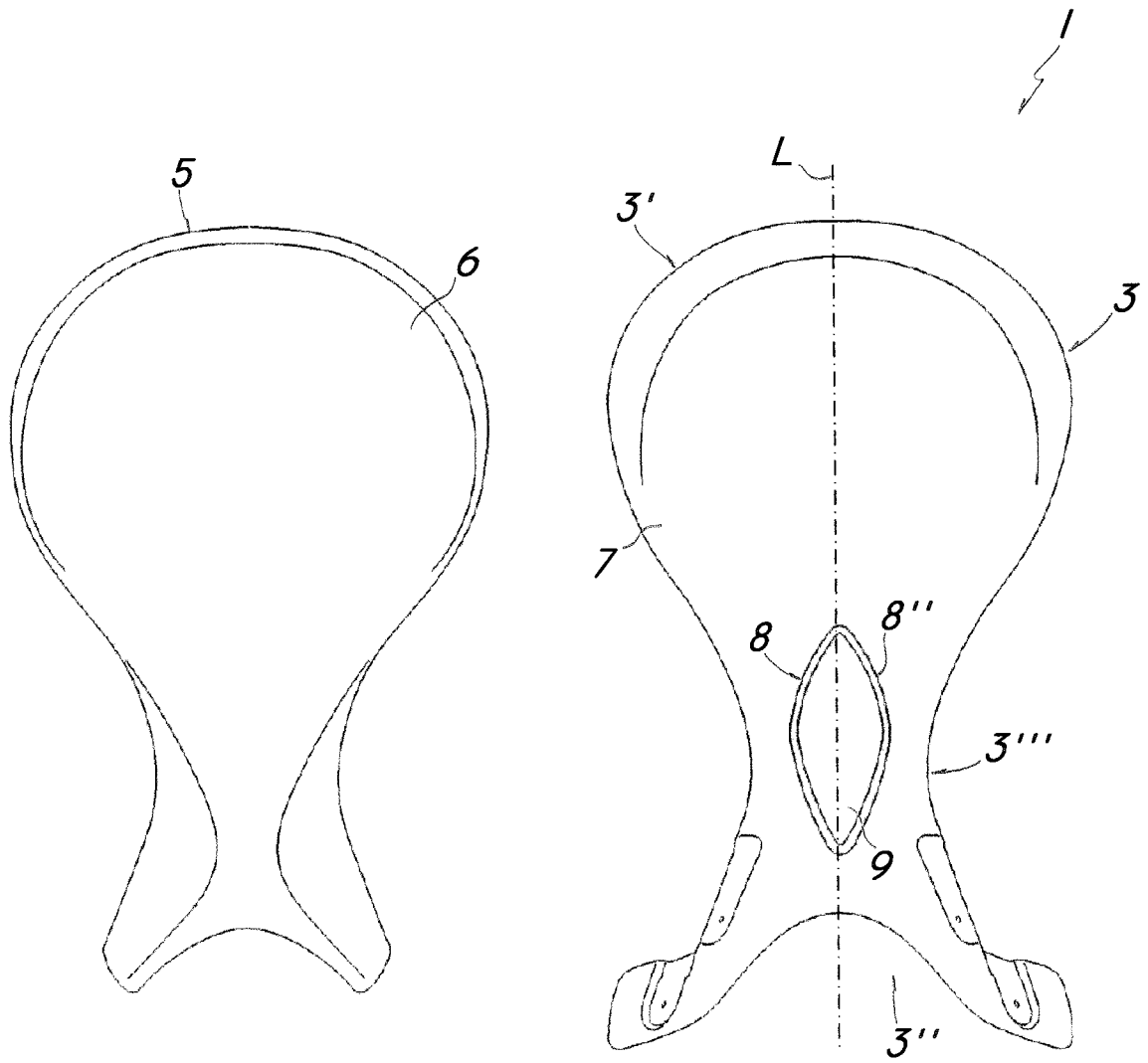


FIG. 1

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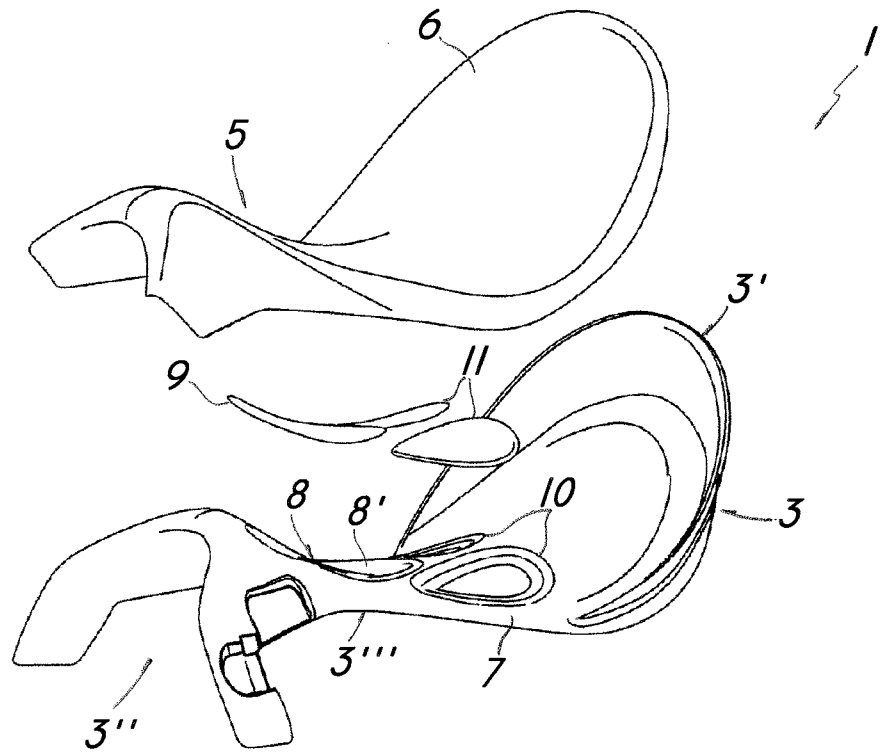


FIG. 2

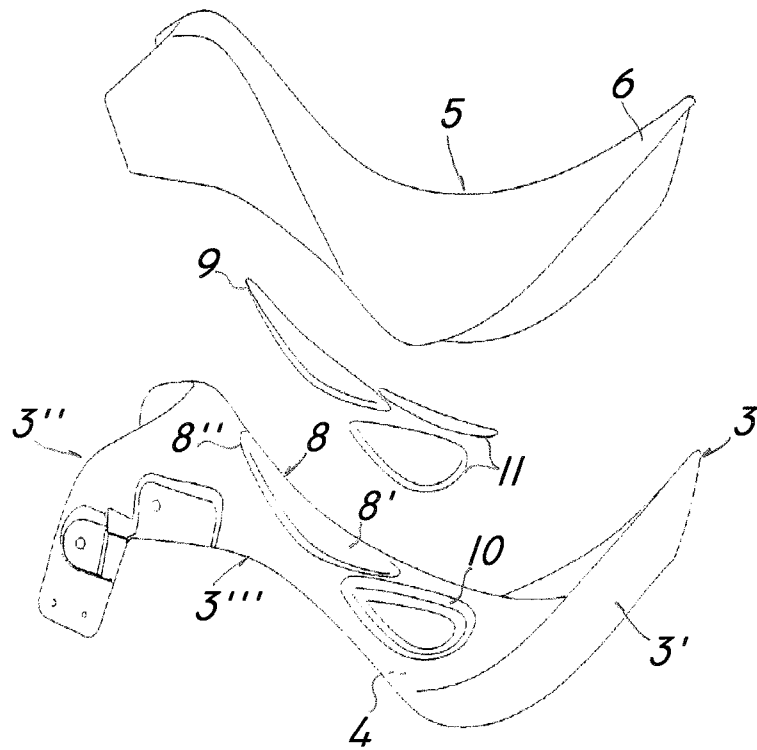


FIG. 3

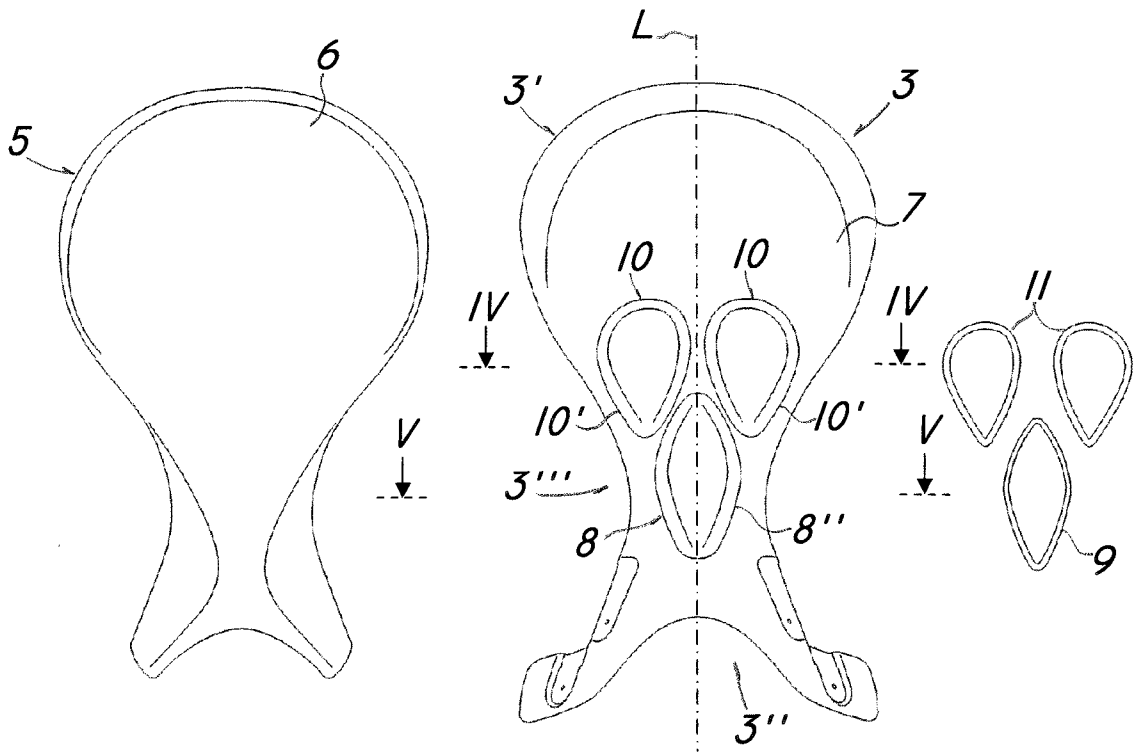


FIG. 4

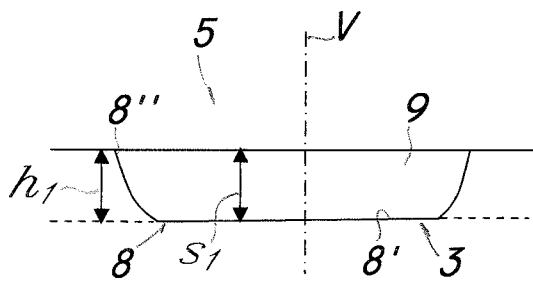


FIG. 5A

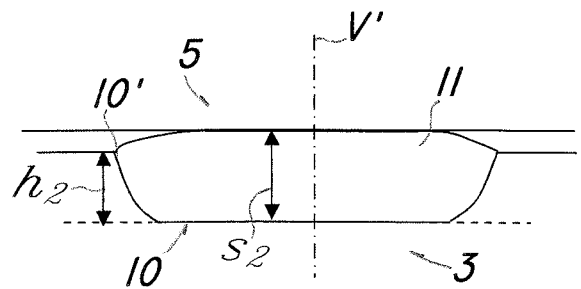


FIG. 5B

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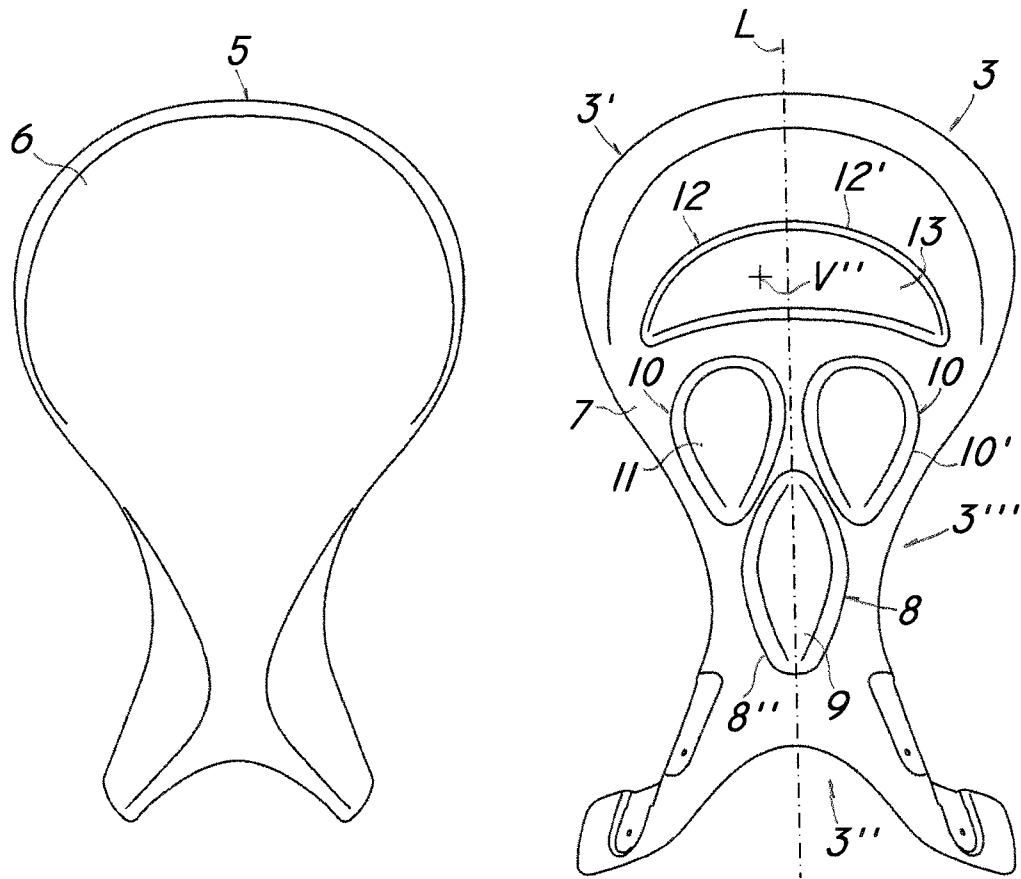


FIG. 6

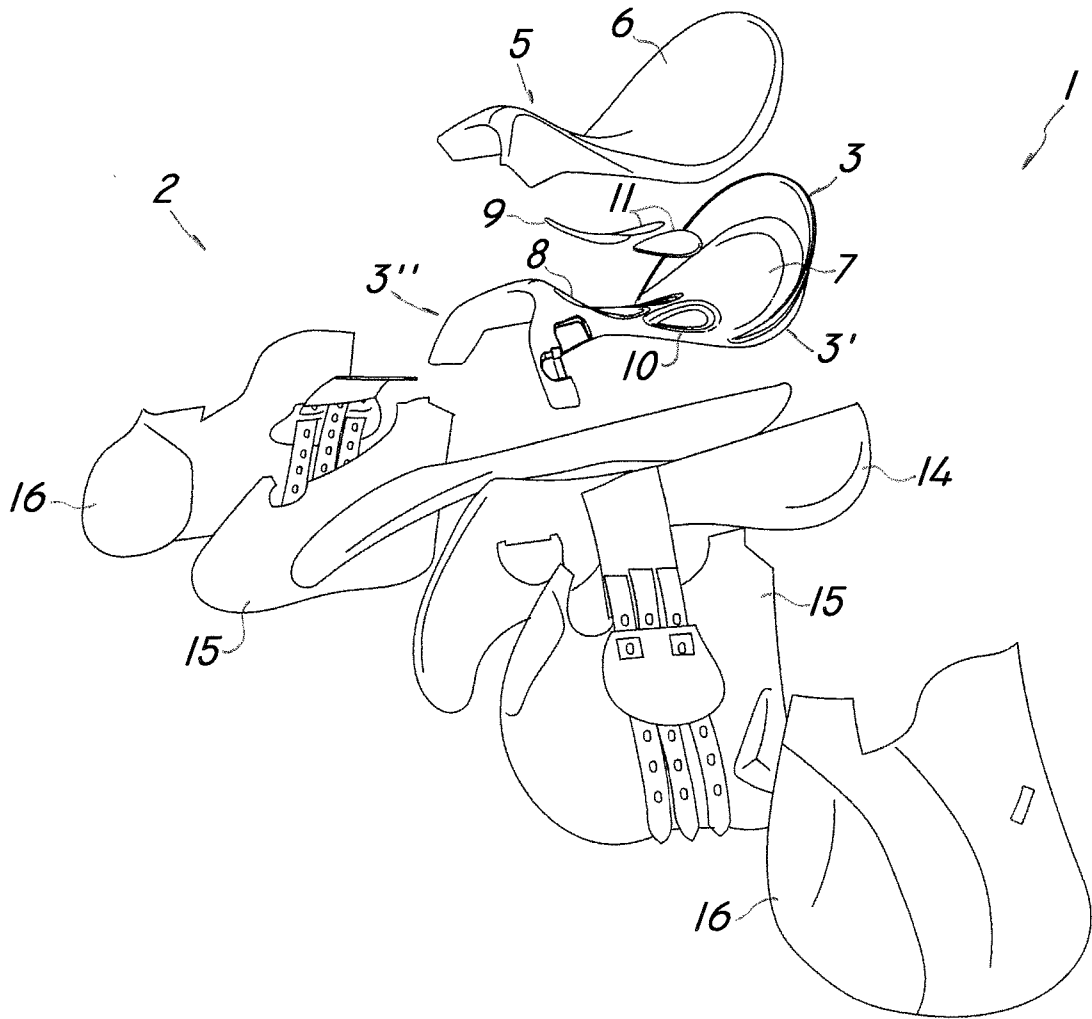


FIG. 7

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/IB2014/062587

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. B68C1/02  
 ADD.

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)  
 B68C

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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A	the whole document	2,3, 7-11,13
A	----- US 5 517 808 A (SCHLEESE JOCHEN [CA]) 21 May 1996 (1996-05-21) column 7, line 34 - column 8, line 12 figures 5,6	1,14
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Further documents are listed in the continuation of Box C.       See patent family annex.

\* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>
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Date of the actual completion of the international search  <b>22 September 2014</b>	Date of mailing of the international search report  <b>30/09/2014</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  <b>Espeel, Els</b>
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International application No

PCT/IB2014/062587

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