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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
28 September 2006 (28.09.2006)

PCT

(10) International Publication Number
WO 2006/100564 A1

(51) International Patent Classification:
B62J 1/08 (2006.01)

(21) International Application Number:
PCT/IB2006/000625

(22) International Filing Date: 22 March 2006 (22.03.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
VI2005A000088 24 March 2005 (24.03.2005) IT

(71) Applicant *(for all designated States except US)*: **SELLE ROYAL** [IT/IT]; Via Vittorio Emanuele, 141, I-36050 Pozzoleone (IT).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **SEGATO, Stefano** [IT/IT]; Corso Padova, 140/a, I-36100 Vicenza (IT).

(74) Agent: **MAROSCIA, Antonio**; Maroscia & Associati SRL, Contra' S. Caterina, 29, I-36100 Vicenza (IT).

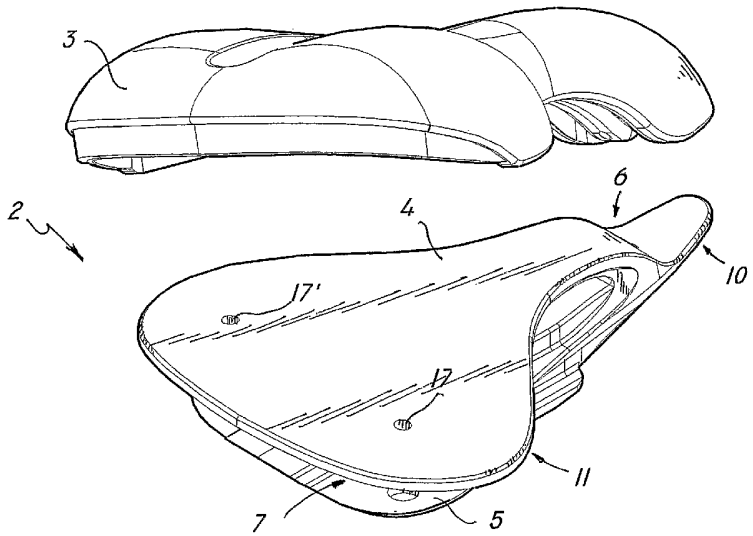
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC,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

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

Published:
— *with international search report*

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

(54) **Title:** AN INTEGRATED HUMAN BODY SUPPORT STRUCTURE, PARTICULARLY A SADDLE OR SEAT FOR A VEHICLE



(57) **Abstract:** An integrated human body support structure, particularly a saddle or seat for a vehicle. The structure comprises an upper element (4) having longitudinal end portions (8, 8') and a lower element (5) having longitudinal end portions (9, 9'). The upper element (4) faces and is transversely spaced from said lower element (5). Furthermore, these elements are monolithically and elastically joined at one of their longitudinal ends (6) to define a gap (7) therebetween whereby the opposite free ends (8, 9) may adjust the gap (7) as the load applied to the structure changes. Thanks to this configuration the structure of the invention substantially helps to take up of the stresses from the vehicle on which the structure is mounted.

WO 2006/100564 A1

AN INTEGRATED HUMAN BODY SUPPORT STRUCTURE, PARTICULARLY A SADDLE OR SEAT FOR A VEHICLE

Field of the invention

The present invention finds application in the field of support structures, and particularly relates to an integrated human body support structure as described in the preamble of claim 1.

Background of the invention

In the field of human body support structures, such as bicycle saddles, car seats or the like, is increasingly desired to provide a structure, which combines light weight and resistance to the various mechanical stresses that can occur during normal use of the vehicle. Also, attempts are being made to develop new solutions which increase seating comfort and provide a more effective distribution of cyclist's weight as well as an improved shock absorption.

As is known, in conventional saddles, the connection to the seat post is accomplished by rigid members, typically two metal rods, e.g. made of steel or an alloy, which are longitudinally arranged below the lower support of the saddle, at a proper distance from each other. These rods are secured to the saddle and the seat post by various mechanical connection means, such as plates and screws.

This conventional solution has the apparent drawback of adding weight to the structure and of employing an external element, which greatly affects aerodynamic properties. Also, metal structures do not allow simple and stable adjustments and the various stresses acting on the saddle during normal use may cause such rods to be misaligned with respect to the saddle structure.

Finally, with light weight being an aim of saddle design, increasingly expensive materials have been used, such as titanium or advanced composites, which are not always cost-effective.

In an attempt to obviate the above drawbacks, a few solutions have been proposed, in which the lower support of the saddle is solid with the connection to the seat post.

US-A-6,561,578 discloses a bicycle saddle in which the connection with the seat post consists of a single longitudinally extending rail, formed integrally with the support. Nevertheless, this solution has the apparent drawback of further stiffening the whole structure of the saddle, thus preventing the insertion of any means for improving shock absorption.

Hence, the stresses associated to normal cycling can only dampened by the pad between the upper cover and the lower support. As a result, the stresses are poorly taken up by the saddle, and are almost entirely transmitted to the user.

Summary of the Invention

The object of this invention is to overcome the above drawbacks, by providing a support structure that is highly efficient and relatively cost-effective.

A particular object is to provide a support structure that, in spite of its integral design, can almost entirely take up the normal stresses acting on a vehicle, regardless of the provision of a pad or any other shock absorbing device.

Finally, another object is to provide an integrated saddle structure that combines comfort features to the requirement of having a light-weight and resistant structure.

These objects, as well as others that will be apparent hereafter, are fulfilled by providing an integrated human body support structure to be connected to a movable

or stationary frame according to claim 1, which comprises an upper element for supporting a seated user, said upper element having longitudinal end portions; a lower element for connection to said movable or stationary frame, said lower element having longitudinal end portions; characterized in that said upper element is in facing and transversely spaced relationship with respect to said lower element, said upper and lower elements being monolithically and elastically joined proximate to only one of their longitudinal ends to define a gap therebetween to allow the opposite free ends to adjust said gap in response to a load variation applied to the structure.

Thus, the support structure according to the invention allows to take up the shocks and stresses deriving from normal use of the vehicle on which it is mounted, as compared with prior art structures.

Thanks to the upper and lower elements being monolithically and elastically joined at one of their longitudinal ends, these elements may freely adjust the distance therebetween by movements substantially perpendicular thereto, which significantly helps to take up the stresses from the vehicle on which the structure is mounted.

Furthermore, the monolithic arrangement of the two upper and lower elements provides a highly aerodynamic structure, insofar as no external elements adding weight to the structure are present.

Advantageously, both the upper and lower elements may be made of the same base material, that is a substantially a rigid material selected from plastic resins and having a predetermined coefficient of elasticity.

Thanks to this configuration, the structure of the invention will have a particularly light weight and a high resistance.

Furthermore, the use of particularly cost-effective materials will avoid the use of special materials, such as aluminum or titanium alloys or advanced composite

materials, which usually increase fabrication costs for a seat, and particularly a bicycle saddle.

Suitably, the lower element may have a connecting portion, substantially in the form of a profile securable to the movable or stationary frame by appropriate connection means.

Thanks to this additional feature of the invention, the structure may be easily and promptly adjusted in the longitudinal direction defined by the profile. Furthermore, the connection will be highly stable, and prevent any offset between the saddle and the means for connecting the saddle to the frame.

Advantageously, elastic damping means may be interposed between the upper element and the lower element, i.e. substantially a damping member made of a resilient material, preferably placed at one of the longitudinal ends of the structure elements.

Thanks to this additional feature, the structure of the invention may be equipped with an additional shock-absorbing element, which may be possibly adapted to the needs of any specific user.

Furthermore a preferably plate-like portion may be provided on the lower element for attachment of said damping means.

Brief description of the drawings

Further features and advantages of the invention will be more apparent from the detailed description of a preferred, non-exclusive embodiment of an integrated human body support structure according to the invention, which is described by way of a non-limiting example with the help of the annexed drawings, in which:

FIG. 1 is an elevation axonometric view of a support structure according to the invention;

FIG. 2 is an exploded view of the support structure of FIG. 1 with certain details being omitted;

FIG. 3 is a side view of a detail of FIG. 2;

FIG. 4 is an exploded view of the support structure of FIG. 1 with certain details being omitted;

FIG. 5 is a bottom view of a detail of FIG. 2.

Detailed description of a preferred embodiment

The support structure of the invention may support a seated human body, and may thus be configured as a car seat, a chair or a bicycle saddle, as shown in the figures.

As particularly shown in FIG. 1, the support structure, generally designated by numeral 1, may conventionally include a shell 2 for supporting a resilient pad 3, made of foam, sponge, elastomeric material, gel or the like. The saddle will be connected by suitable connection means M to the frame T of a bicycle.

As shown in FIG. 2, the shell 2 comprises an upper element 4 for supporting a seated of a user, and a lower element 5, which is designed to connect the structure to the frame T. The elements 4 and 5 have upper longitudinal ends 8, 8' and lower longitudinal ends 9, 9'.

In accordance with the invention, the upper element 4 and the lower element 5 are monolithically joined at the free front end 6.

Also, the two elements 4 and 5 are transversely spaced to form a gap 7 whereby the opposite free ends 8 and 9 of the elements 4 and 5 can adjust the gap 7, in the direction of arrow F, in response to an applied load, e.g. when a cyclist sits on the saddle or rides across a depression in the ground.

Conveniently, the two elements 4 and 5 may be made of a rigid or semi-rigid material, namely reinforced polymer materials such as glass fiber-reinforced polyamide 66. A number of methods, such as molding, may be used to form them.

In a preferred, non exclusive embodiment of the invention, the upper element 4 may have an elongate front portion 10 and a widened rear portion 11, for optimized fit of the seated position of the user.

Preferably, the upper element 4 will have a tapered front end 6, to form a connecting portion having adequate elasticity and resistance to the stresses associated to cycling.

Advantageously, the lower element 5 may have a lower portion 13 in the form of a profile, mainly extending in the longitudinal direction, along axis X, to allow easy adjustment of the whole saddle in such direction of extension.

Suitably, proper elastic damping means 14, made of a resilient material such as an elastomer, may be inserted in the gap 7 defined by the two elements 4, 5. The element 14 may be formed directly therein by comolding.

To provide further stability in the coupling between the structure 1 and the damping body 14, the lower element 5 may substantially have a plate shape, with widened anchorage rear portions 15, 15'. This may suitably have through holes 16 for anchorage of the resilient pad 3 to the structure 1.

Furthermore, the upper element 4 may have through holes 17, 17', 17" for securing the saddle pad 3 thereto.

As is apparent from the foregoing, the integrated support structure of the invention fulfils the intended objects, and particularly it provides a support structure that, in spite of its integral design, can almost entirely take up the normal stresses acting on a vehicle, regardless of the provision of a pad or any other shock absorbing device.

Thanks to the upper and lower elements being monolithically and elastically joined at one of their longitudinal ends, these elements are free to adjust the distance therebetween along a plane that is substantially perpendicular thereto, which significantly helps to take up the stresses from the vehicle on which the structure is mounted.

The integrated support structure of this invention is susceptible of numerous modifications and changes falling, 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 depending on different needs, without departure from the scope of the invention.

While the invention has been described with particular reference to the accompanying figures, the numerals referred to in the disclosure and claims 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.

CLAIMS

1. An integrated human body support structure, such as a saddle or vehicle seat for coupling to a movable or stationary frame (T), comprising:

- an upper element (4) for supporting a seated user, said upper element having longitudinal end portions (8, 8');
- a lower element (5) for connection to said movable or stationary frame (T), said lower element (5) having longitudinal end portions (9, 9');

characterized in that said upper element (4) is in facing and transversely spaced relationship with respect to said lower element (5), said upper element (4) and said lower element (5) being monolithically and elastically joined proximate to only one of their longitudinal ends (6) to define a gap (7) therebetween to allow the opposite free ends (8, 9) to adjust said gap (7) in response to a load variation applied to the structure.

2. Structure as claimed in claim 1, characterized in that said upper element (4) and said lower element (5) are made of the same substantially rigid base material, having a predetermined coefficient of elasticity.

3. Structure as claimed in claim 1, characterized in that said upper element (4) has a substantially elongate shape, with a tapered front end (8') at the end (6) for connection to said lower element (5) and a widened rear end portion (8) at the opposite free end.

4. Structure as claimed in claim 1, characterized in that said lower element (5) comprises a portion (13) for anchorage to said frame by suitable connection means, said anchoring portion (13) being substantially elongate and defining substantially longitudinal axis (X).

5. Structure as claimed in claim 1, characterized in that it comprises elastic damping means (14) interposed between said upper element (4) and said lower element (5).

6. Structure as claimed in claim 5, characterized in that said damping means (14) is placed between said upper element (4) and said lower element (5) proximate to one of their longitudinal free ends (8, 9).

7. Structure as claimed in claim 5, characterized in that said lower element has abutment portions (15, 15') acting against said elastic damping means (14).

8. Structure as claimed in claim 1, characterized by comprising a elastically yielding pad (3) connectable to said upper element (5).

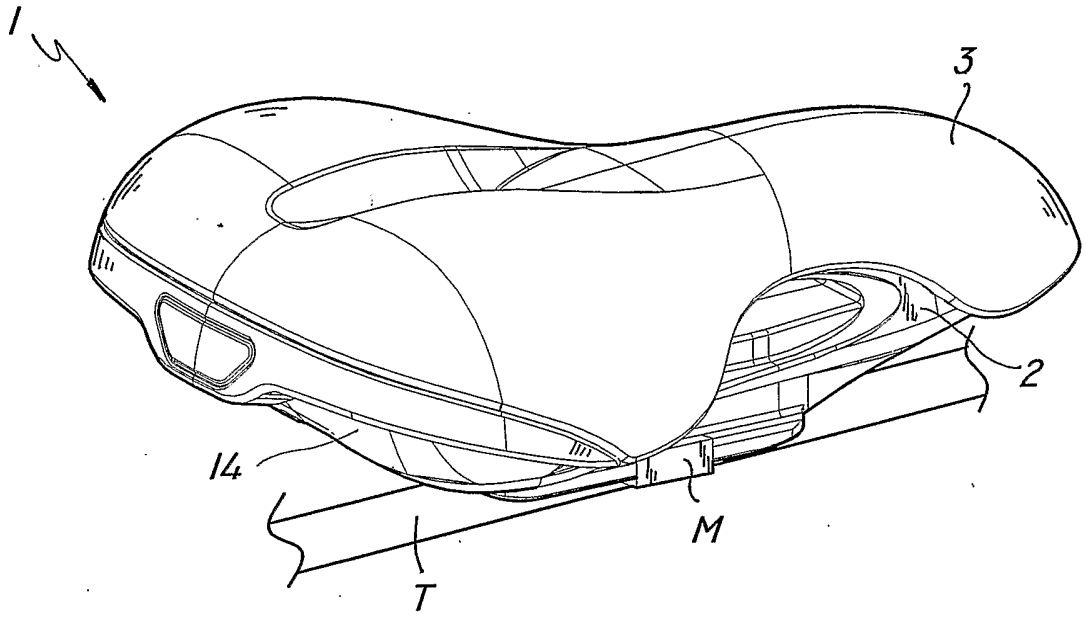


FIG. 1

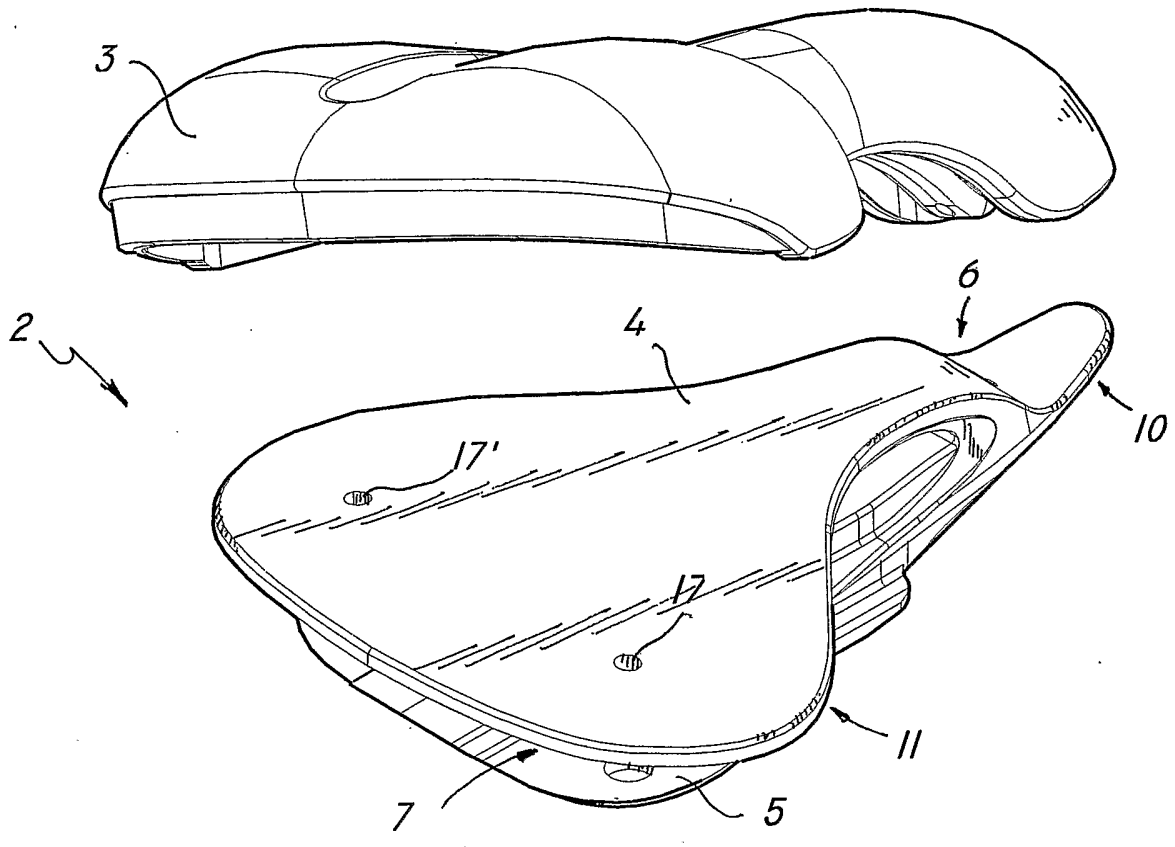


FIG. 2

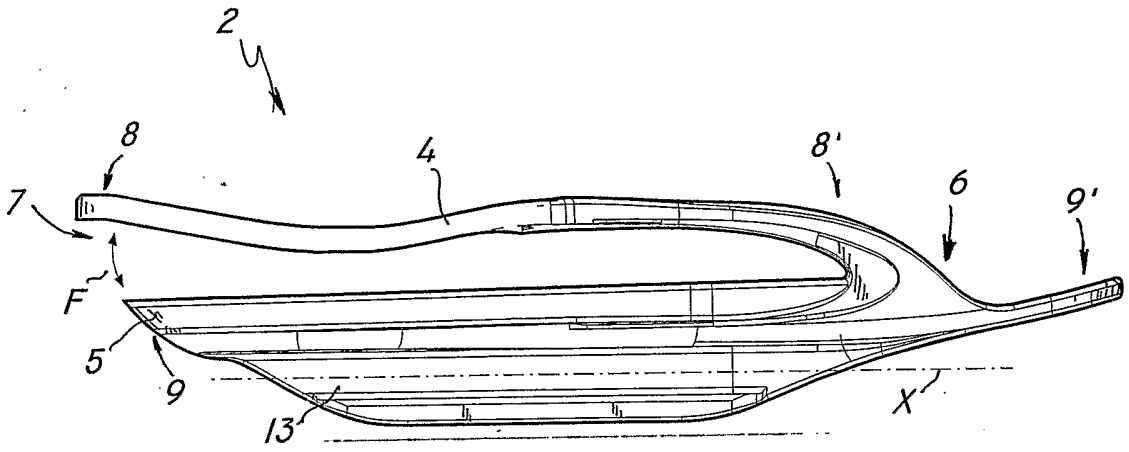


FIG. 3

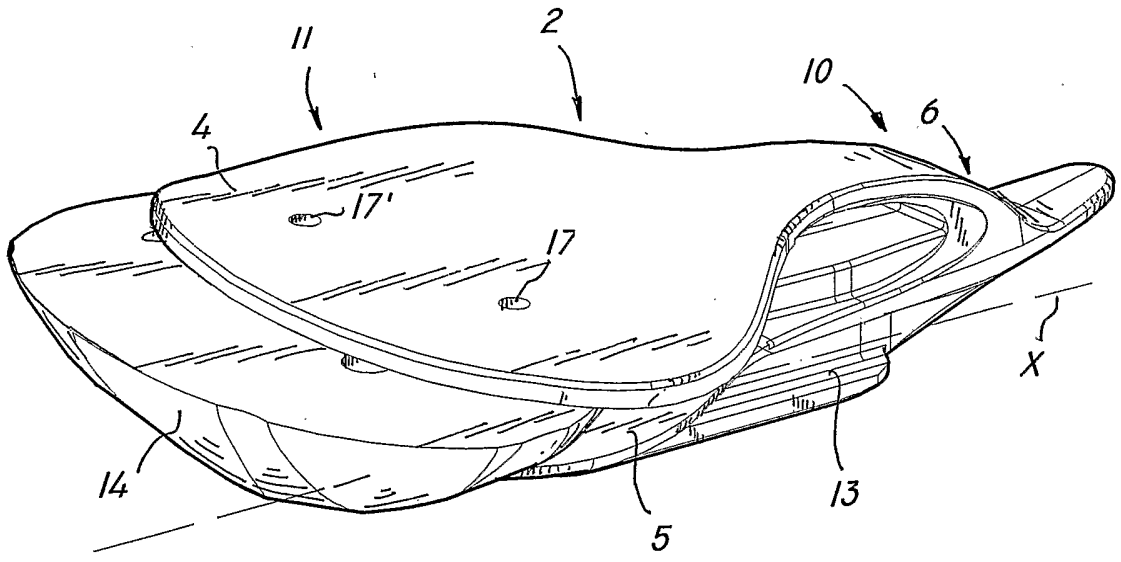


FIG. 4

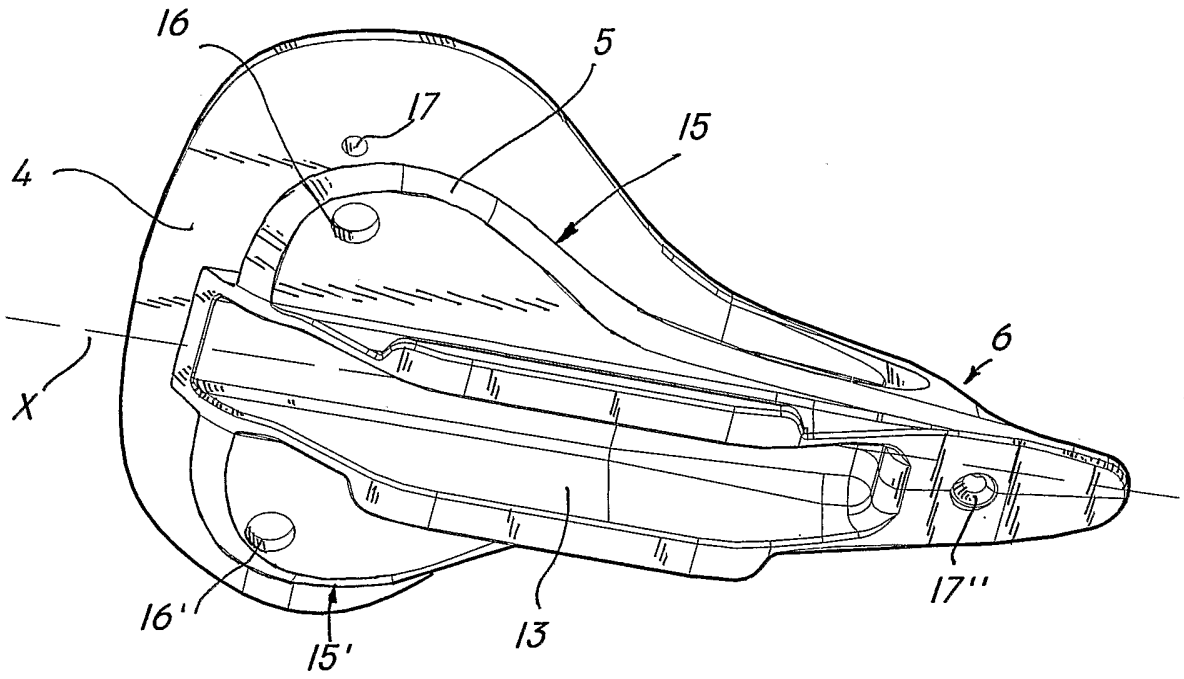


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2006/000625

A. CLASSIFICATION OF SUBJECT MATTER
INV. B62J1/08

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)
B62J

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 practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 295 20 969 U1 (URBAN, KARL-JOERG, 89165 DIETENHEIM, DE) 3 April 1997 (1997-04-03) claims; figures 3,5	1,2,4-8
A	US 6 378 938 B1 (NELSON PAUL DAMIAN) 30 April 2002 (2002-04-30) the whole document	1,2
A	DE 10 12 201 B (JEAN BOURGOIS) 11 July 1957 (1957-07-11) claims; figures	1,5,6
A	FR 2 306 866 A (SIMON ROGER) 5 November 1976 (1976-11-05) claims; figures	1

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

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"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)

"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

"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

"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

"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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 June 2006	06/07/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Grunfeld, M

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2006/000625

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 29520969 U1	03-04-1997	NONE	
US 6378938 B1	30-04-2002	AT 234756 T	15-04-2003
		WO 9427858 A1	08-12-1994
		DE 69432301 D1	24-04-2003
		DE 69432301 T2	04-03-2004
		EP 0705195 A1	10-04-1996
DE 1012201 B	11-07-1957	NONE	
FR 2306866 A	05-11-1976	NONE	