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(54) **Delimitation barrier, in particular for motor-racing circuits**

(57) A delimitation barrier (10), particularly adapted for providing lateral protections in motor racing circuits, which comprises a plurality of dividing elements (1) that are extended along a substantially longitudinal direction of extension (100) and are mutually connected, by way of mutual interconnection elements (2), substantially at the respective longitudinal ends (1a, 1b); at least one of the dividing elements (1) comprises at least one first lateral body (3) and at least one second lateral body (4), which can be mutually connected by way of mutual connection elements (5) and are arranged, during use, predominantly on opposite sides with respect to the substantially longitudinal direction of extension (100) of the respective dividing element (1).

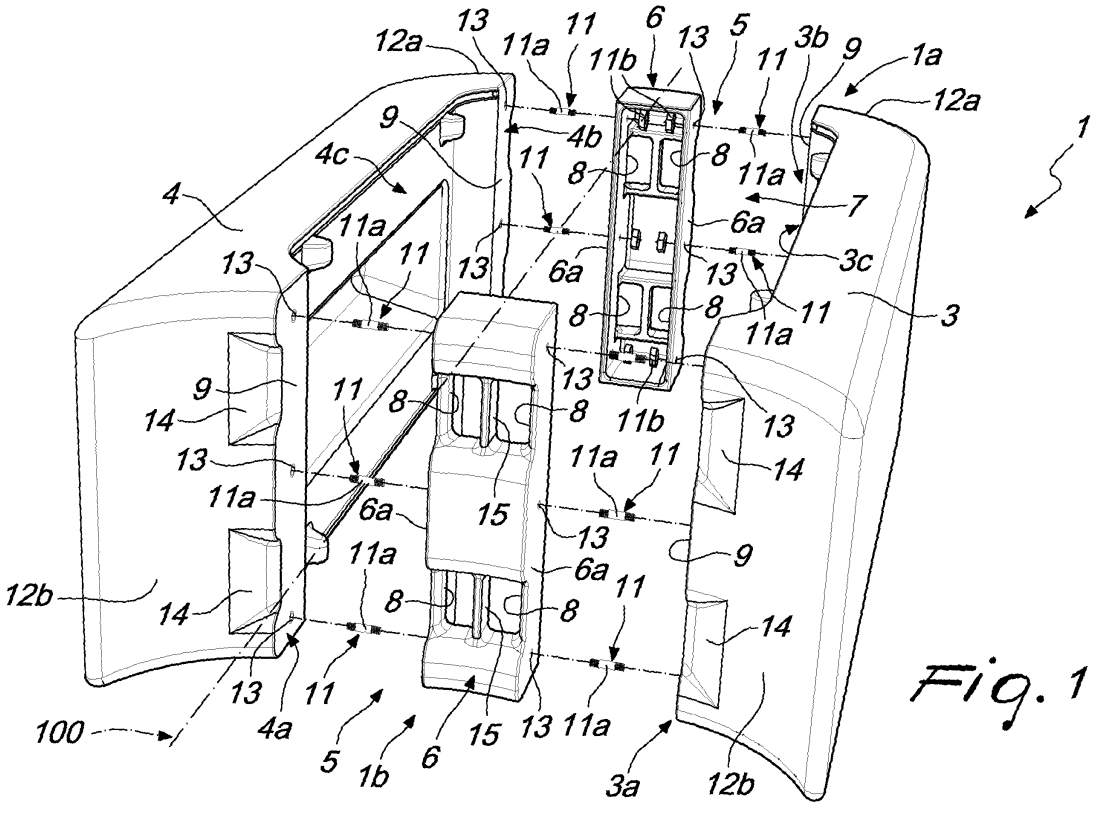

Fig. 1

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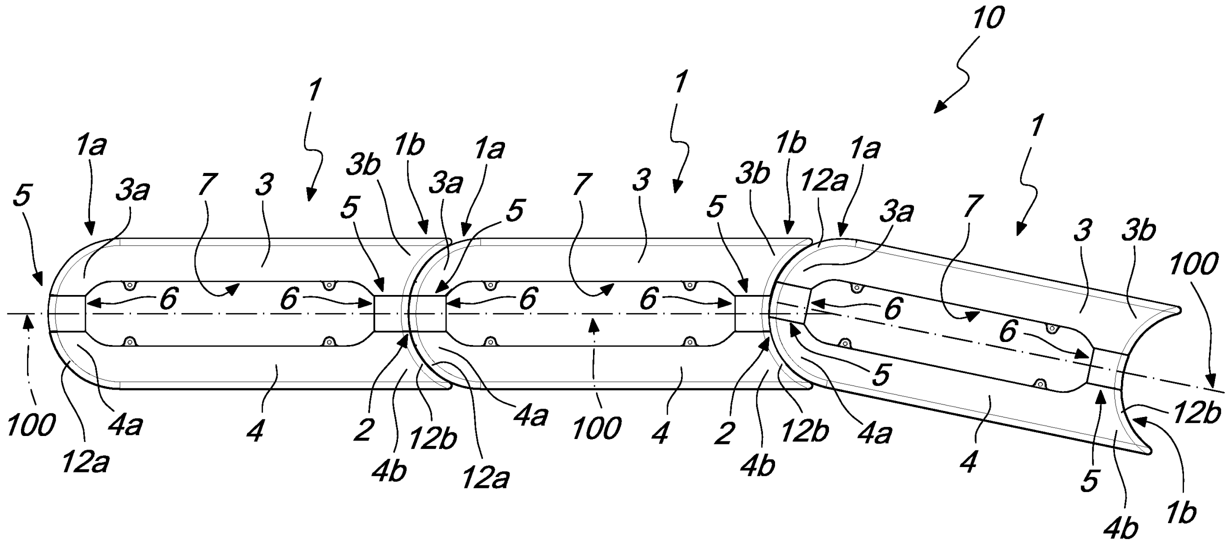
10
1
1
1
1a
1b
1a
1b
12a
1a
3a
3b
3a
3b
3a
3
3b
7
3
7
3
7
5
5
5
5
100
6
6
6
6
6
6
100
12a
4a
2
4b
12b
12a
4a
100
4
2
4b
12b
4a
5
4
5
12b
4b
1b

Fig. 6

Description

[0001] The present invention relates to a delimitation barrier, particularly adapted for providing lateral protections in motor driving circuits, such as autodromes, kartdromes and circuits in general.

[0002] Protective barriers are currently known and widely used in the types of circuit cited above and can be placed at regions of the circuit that are particularly dangerous in case of runoffs and have the purpose of cushioning the impact and at the same time of stopping the motion of the vehicle, absorbing part of the kinetic energy as a consequence of the runoff.

[0003] In some cases, stacks of tires are used as protective barriers, but they have environmental and functional problems, since in certain situations they are unable to cushion the impact effectively.

[0004] Protective barriers have thus been proposed which are constituted substantially by a plurality of dividing elements, generally made of plastics and internally hollow so as to contain a certain volume of air, which are connected to each other at their longitudinal ends so as to provide a continuous barrier.

[0005] In general, in order to mutually connect the various dividing elements, openings are provided at the longitudinal ends of each dividing element, which is generally obtained by molding monolithically; connecting straps are made to pass through such openings and therefore mutually connect, by being arranged parallel to the longitudinal direction of extension of the delimitation barrier, the individual dividing elements arranged in succession.

[0006] In order to allow the connection between the various belts, an opening is thus provided at the top part of the dividing elements.

[0007] It is thus evident that the dividing elements thus provided also are not free from drawbacks.

[0008] First of all, it is very laborious to act on the individual dividing elements to obtain, at the respective longitudinal ends, the openings into which the connecting straps are to be passed.

[0009] Moreover, it is likewise awkward to have to remove, by means of cutters or similar tools, the top part of the dividing elements in order to be able to mutually connect the connecting straps.

[0010] Finally, in order to be effective, each dividing element must have rather large dimensions: by way of example, a length of approximately 100 cm and a width and height comprised between 40 and 50 cm.

[0011] Obviously, in order to be able to provide, as usual, such plastics dividing elements, it is necessary to use large molds and typically rotary molding, which, as is known, requires extremely long times to mold a single part.

[0012] Moreover, if some parts of dividing elements are damaged as a consequence of an impact, it is necessary to replace fully the damaged part, with an evident expenditure of time (required to remove the dividing element or elements to be replaced, by extracting the connecting belts) and of cost.

[0013] The aim of the present invention is to solve the problems and obviate the drawbacks cited above, by providing a delimitation barrier, particularly adapted for providing lateral protections in motor racing circuits, that is considerably easier and more practical to use than known types of protective barrier.

[0014] Within this aim, an object of the invention is to provide a delimitation barrier, particularly adapted for providing lateral protections in motor racing circuits, that is reliable and in which the individual elements are simple to obtain and assemble.

[0015] Another object of the invention is to provide a delimitation barrier, particularly adapted for providing lateral protections in motor racing circuits, that has a competitive production cost, so as to make its use advantageous also from an economic standpoint.

[0016] This aim and these and other objects that will become better apparent hereinafter are achieved by a delimitation barrier, particularly adapted for providing lateral protections in motor racing circuits, comprising a plurality of dividing elements that are extended along a substantially longitudinal direction of extension and are mutually connected, by way of mutual interconnection means, substantially at the respective longitudinal ends, **characterized in that** at least one of said dividing elements comprises at least one first lateral body and at least one second lateral body, which can be mutually connected by way of mutual connection means and are arranged, during use, predominantly on opposite sides with respect to the substantially longitudinal direction of extension of said dividing element.

[0017] Further characteristics and advantages of the invention will become better apparent from the following detailed description of some preferred but not exclusive embodiments of a delimitation barrier according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is an exploded perspective view of a dividing element;
Figure 2 is a perspective view of a first lateral body;
Figure 3 is an elevation view of the first lateral body shown in Figure 2;
Figure 4 is a perspective view of a spacer body;
Figure 5 is a front view of the spacer body shown in Figure 4;
Figure 6 is a top view of a sequence of dividing elements mutually interconnected to provide a delimitation barrier.

[0018] In the exemplary embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0019] Moreover, it is noted that anything found to be

already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0020] With reference to the figures, a delimitation barrier, particularly adapted for providing lateral protections in motor racing circuits and generally designated by the reference numeral 10, comprises a plurality of dividing elements 1, which have an elongated shape and are extended along a substantially longitudinal direction of extension that is designated by the reference numeral 100 in the figures.

[0021] The dividing elements 1 are mutually connected, by way of mutual interconnection means 2 described hereinafter, substantially at the respective longitudinal ends 1a and 1b.

[0022] According to the present invention, at least one of the dividing elements 1 comprises at least one first lateral body 3 and at least one second lateral body 4, which can be mutually connected by way of mutual connection means 5 and are arranged, during use, predominantly on opposite sides with respect to the substantially longitudinal direction of extension 100 of the dividing element 1, and more specifically, with respect to the plane that passes through the longitudinal direction of extension 100 and is perpendicular, during use, to the surface of the track.

[0023] In greater detail and with particular attention to what is shown in the top view of Figure 6, the delimitation barrier 10 is constituted by a plurality of dividing elements 1 according to the invention; in the specific case, each dividing element 1 has, at its longitudinal ends 1a and 1b, respectively a convex cylindrical surface 12a and a concave cylindrical surface 12b, which are extended around a respective axis which lies, during use, along a direction that is substantially perpendicular to the plane of the track on which the delimitation barrier 10 is placed.

[0024] In particular, the individual dividing elements 1 are arranged in succession so that the convex cylindrical surface 12a of a certain dividing element 1 abuts against the concave cylindrical surface 12b of the dividing element that is adjacent thereto, so as to allow mutual connection between two adjacent dividing elements 1 and, at the same time, the adjustment of the mutual angular arrangement between the respective substantially longitudinal directions of extension 100 of the various dividing elements arranged in succession.

[0025] Both the first lateral body 3 and the second lateral body 4 comprise a respective internally hollow containment body, which advantageously is made of plastics by molding and is adapted to contain a certain volume of air, so as to perform, during the impact, a kinetic energy absorption function.

[0026] Advantageously, the first lateral body 3 is shaped correspondingly with respect to the second lateral body 4: this allows to provide, with a single mold, both the lateral bodies 3, 4 of the dividing element 1, with an evident saving in terms of part management and with the possibility to use, thanks to the relatively small dimensions and the particular shape of the lateral bodies 3, 4, injection molding processes which, as is known, are extremely quick and economically advantageous.

[0027] Conveniently, the mutual connection means 5 can provide for the presence of an interconnecting spacer body 6, which is designed to connect two respective longitudinal ends 3a, 4a and 3b, 4b of the first lateral body 3 and of the second lateral body 4.

[0028] According to a preferred embodiment, the dividing element or elements 1 comprise two spacer bodies 6 designed to mutually connect the respective longitudinal ends 3a, 4a and 3b, 4b of the first lateral body 3 and of the second lateral body 4 so as to form an access and work compartment 7 between the surfaces 3c and 4c of the first lateral body 3 and of the second lateral body 4 that are directed toward the longitudinal direction of extension 100.

[0029] Advantageously, the spacer body 6 comprises at least one accommodation opening 8 for at least one respective elongated connecting element that passes longitudinally through the dividing elements 1 arranged in succession.

[0030] Such elongated element can be, for example, constituted by a belt or by a strip of flexible material that can be inserted, during use, through the openings 8 to run parallel to the longitudinal extension of the delimitation barrier 10 and within the access and work compartments 7.

[0031] The spacer body or bodies 6 have two lateral abutment surfaces 6a, each designed to abut against a respective abutment surface 9 that is formed at the respective longitudinal ends 3a, 4a and 3b, 4b of the first lateral body 3 and of the second lateral body 4.

[0032] In order to allow to mutually assemble the lateral bodies 3 and 4 and the respective spacer bodies 6, there are elements 11 for stable connection which act between the lateral abutment surfaces 6a and the respective abutment surfaces 9.

[0033] At the exemplifying level, the stable connection elements 11, which in practice constitute the mutual connection means 5, can be constituted by elongated elements 11a, which have end threads and can be inserted in respective engagement openings 13 provided at the lateral abutment surfaces 6a and at the respective abutment surfaces 9. Mutual locking can occur by using, for example, locking nuts 11b, which can engage the end threads and are designed to fasten against each other the lateral abutment surfaces 6a and the respective abutment surfaces 9.

[0034] Of course, nothing forbids to use different connecting devices, such as for example rivets.

[0035] To facilitate the operations for mutually locking the lateral bodies 3, 4 and the spacer bodies 6, it is possible to provide recesses 14 that can be accessed from the outside of the dividing elements 1.

[0036] The spacer bodies 6 cooperate, in particular, with the respective longitudinal ends 3a, 4a and 3b, 4b of the first lateral body 3 and of the second lateral body

4 in order to define the convex cylindrical surface 12a and the concave cylindrical surface 12b.

[0037] Conveniently, on the spacer bodies 6 there is at least one anchoring element 15, which is designed, by means of a belt or strap element, to be connected stably to an anchoring element 15 that is formed on a spacer body 6 that is supported by the proximate longitudinal end of a dividing element 1 arranged contiguously.

[0038] The use of a delimitation barrier 10 according to the invention is evident from what has been described above.

[0039] In particular, the first lateral bodies 3 and the second lateral bodies 4 are connected, by way of the mutual interconnection means 5, by interposing appropriately the spacer bodies 6 so as to obtain a plurality of dividing elements 1.

[0040] The dividing elements 1 thus obtained are then mutually connected by using belts or straps, so as to provide a delimitation barrier 10 that can have even a curved extension thanks to the mating of the concave surfaces 12b and of the convex surfaces 12a of two dividing elements 1 arranged in succession.

[0041] If, as a consequence of an impact, only one of the lateral bodies 3, 4 is damaged, it is possible to act by replacing only the damaged part, without moreover removing the connecting means 5.

[0042] Further, it has been verified experimentally that it is possible to produce the parts that constitute the dividing element 1 by injection molding, with an evident saving in terms of costs and times.

[0043] Moreover, the fact that a work compartment 7 has been provided between the lateral bodies 3 and 4 allows extremely practical and quick interventions without the need to have to intervene to remove part of the external surface as is usual in currently commercially available protective barriers.

[0044] All the characteristics of the invention indicated above as being advantageous, convenient or the like may also be omitted or be replaced by equivalents.

[0045] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0046] In practice it has been found that the invention has achieved its intended aim and objects in all of its embodiments.

[0047] In practice, the dimensions may be any according to requirements.

[0048] All the details may further be replaced with other technically equivalent elements.

[0049] The disclosures in Italian Patent Application No. VR2009A000079 from which this application claims priority are incorporated herein by reference.

[0050] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A delimitation barrier (10), particularly adapted for providing lateral protections in motor racing circuits, comprising a plurality of dividing elements (1) that are extended along a substantially longitudinal direction of extension (100) and are mutually connected, by way of mutual interconnection means (2), substantially at the respective longitudinal ends (1a, 1b), **characterized in that** at least one of said dividing elements (1) comprises at least one first lateral body (3) and at least one second lateral body (4), which can be mutually connected by way of mutual connection means (5) and are arranged, during use, predominantly on opposite sides with respect to the substantially longitudinal direction of extension (100) of said dividing element (1).

2. The delimitation barrier (10) according to claim 1, **characterized in that** said at least one first lateral body (3) and said at least one second lateral body (4) comprise a respective internally hollow containment body that is adapted to contain a volume of air.

3. The delimitation barrier (10) according to claim 1, **characterized in that** said at least one first lateral body (3) is shaped correspondingly with respect to said at least one second lateral body (4).

4. The delimitation barrier (10) according to one or more of the preceding claims, **characterized in that** said mutual connection means (5) comprise an interconnecting spacer body (6), which is designed to connect two respective longitudinal ends (3a, 4a; 3b, 4b) of said at least one first lateral body (3) and of said at least one second lateral body (4).

5. The delimitation barrier (10) according to one or more of the preceding claims, **characterized in that** said at least one dividing element (1) comprises two spacer bodies (6) for the mutual connection of said at least one first lateral body (3) and of said at least one second lateral body (4) at the respective longitudinal ends (3a, 4a; 3b, 4b) so as to form an access and work compartment (7) between surfaces (3c, 4c) of said at least one first lateral body (3) and of said at least one second lateral body (4) that are directed toward said longitudinal direction of extension (100).

6. The delimitation barrier (10) according to one or more of the preceding claims, **characterized in that** said spacer body (6) comprises at least one accommodation opening (8) for at least one respective

elongated connecting element that passes longitudinally through said dividing elements (1).

7. The delimitation barrier (10) according to one or more of the preceding claims, **characterized in that** said spacer body (6) comprises at least two lateral abutment surfaces (6a), each designed to abut against a respective abutment surface (9) that is formed at the respective longitudinal ends (3a, 4a; 3b, 4b) of said at least one first lateral body (3) and of said at least one second lateral body (4), elements (11) for stable connection between said lateral surfaces (6a) and the respective abutment surfaces (9) being provided.

8. The delimitation barrier (10) according to claim 1, **characterized in that** said longitudinal ends (1a, 1b) of said dividing elements (1) comprise respectively a concave cylindrical surface (12b) and a convex cylindrical surface (12a), which are extended around a respective axis which lies, during use, along a direction that is substantially perpendicular to the plane of the track, and are adapted to allow the mutual connection between two adjacent dividing elements (1), adjusting the mutual angular arrangement between the respective substantially longitudinal directions of extension (100).

9. The delimitation barrier (10) according to claim 8, **characterized in that** said spacer body (6) cooperates with the respective longitudinal ends (3a, 3b; 4a, 4b) of said at least one first lateral body (3) and of said at least one second lateral body (4) in order to define said concave cylindrical surface (12b) and said convex cylindrical surface (12a).

10. The delimitation barrier (10) according to one or more of the preceding claims, **characterized in that** said spacer body (6) comprises at least one anchoring element (15), which is designed, by means of a belt or strap element, to be connected stably to an anchoring element (15) that is formed on a spacer body (6) that is supported by a proximate longitudinal end of a dividing element (1) arranged contiguously.

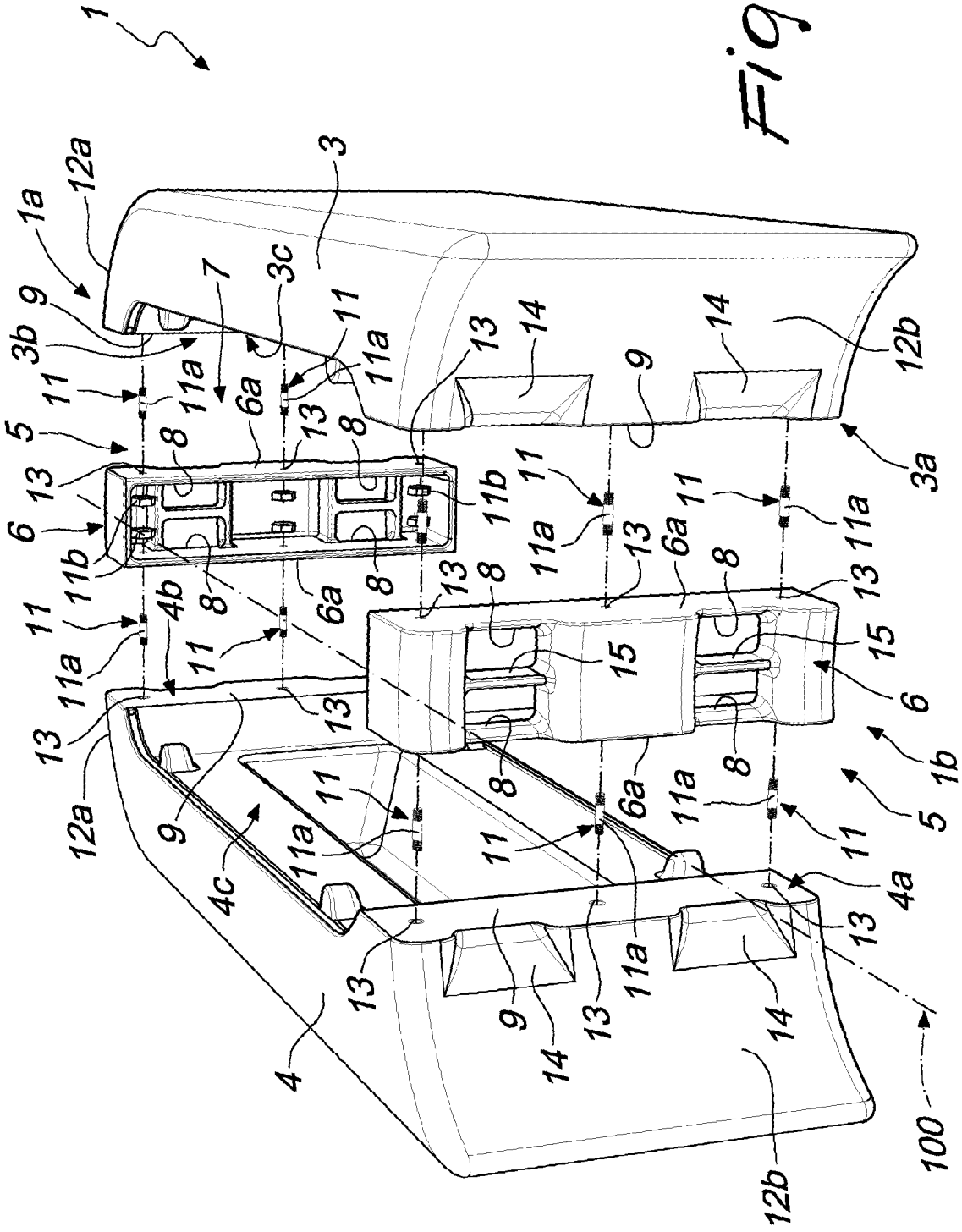

Fig. 1

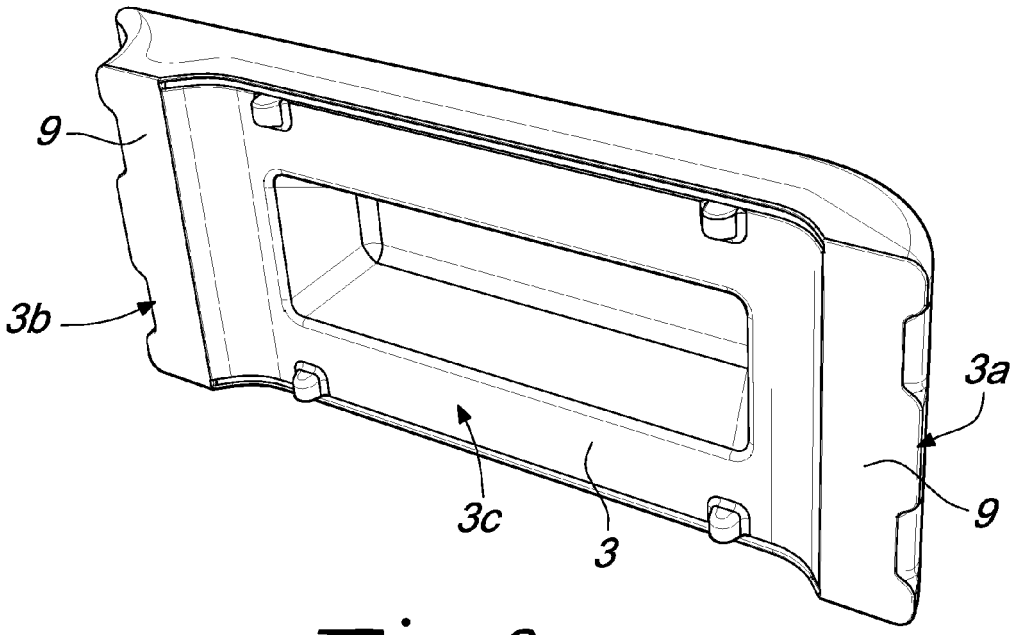

Fig. 2

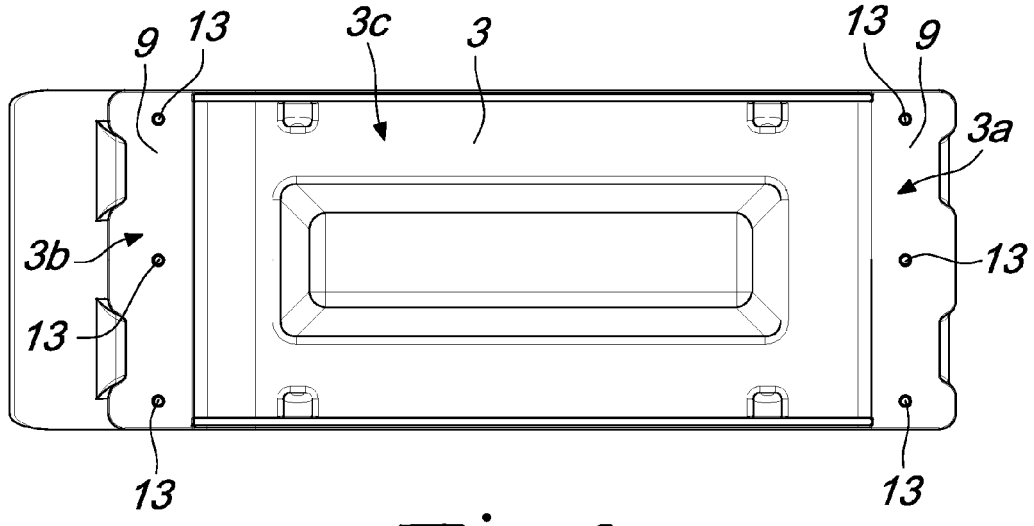

Fig. 3

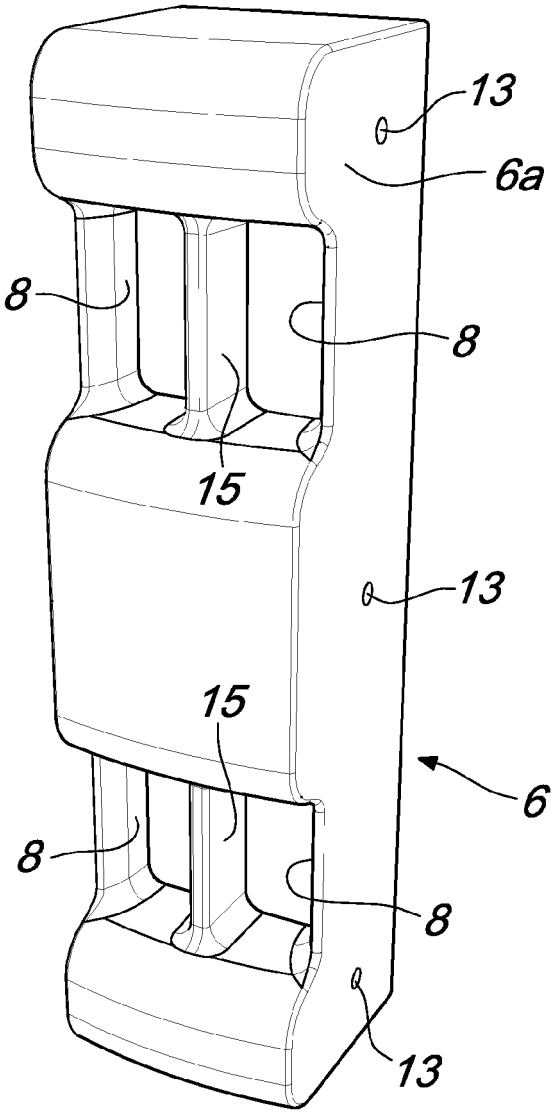

Fig. 4

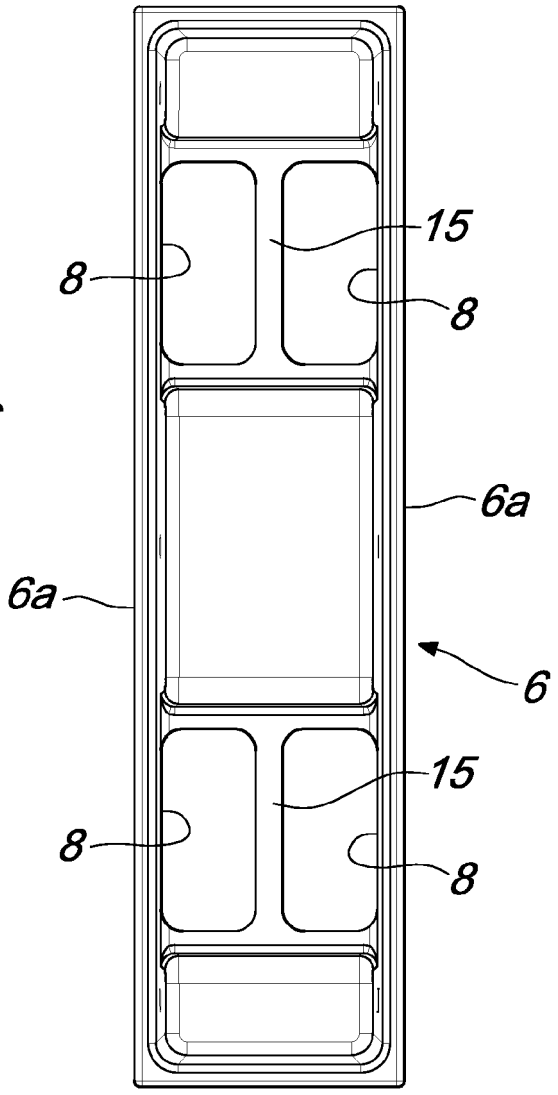

Fig. 5

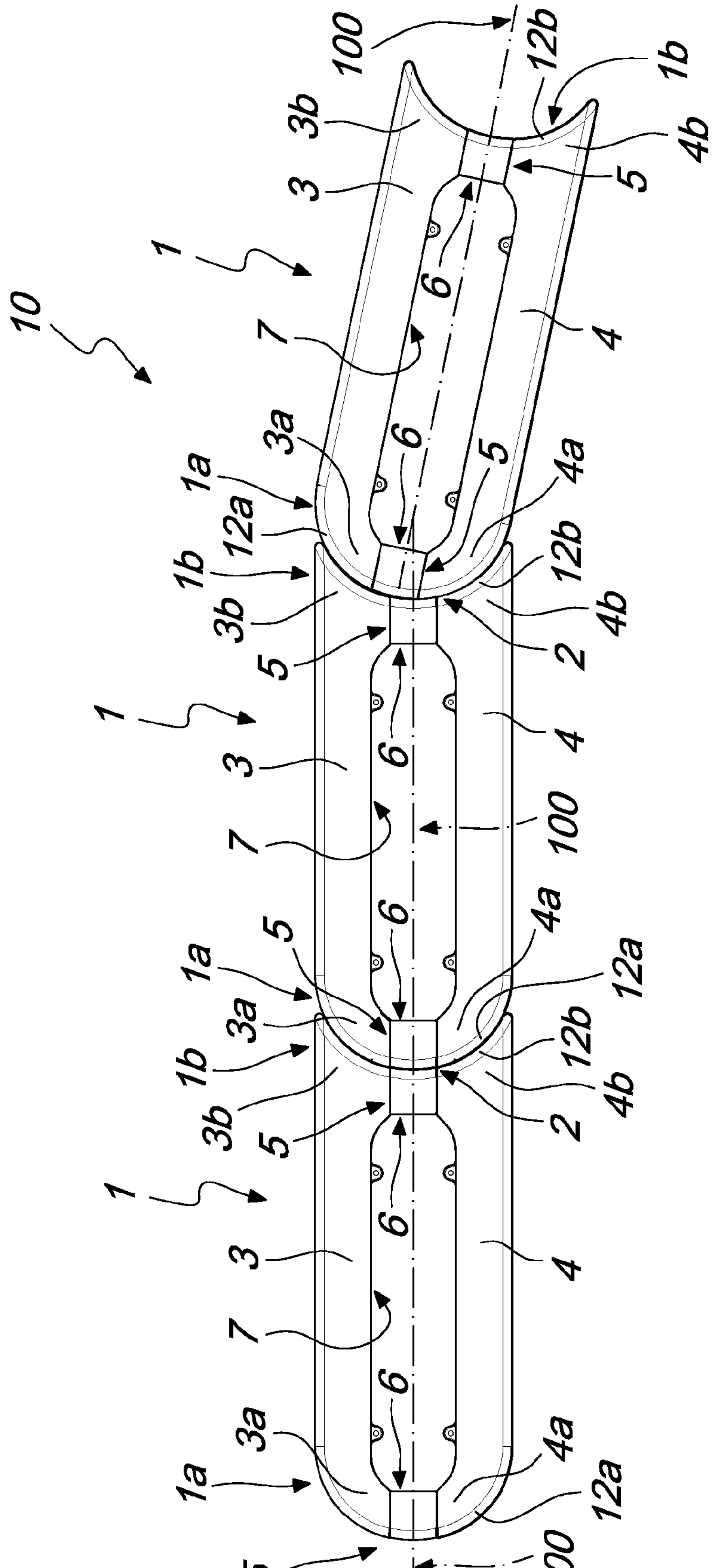

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 10 16 4030

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 02/44476 A1 (RLT DESIGN LTD [GB]; TAGG RICHARD LEACH [GB]) 6 June 2002 (2002-06-06) * figure 13 * * page 10, lines 5-9 * * page 7, line 23 - page 8, line 4; figures 3,4 * * page 7, lines 4-6 *	1-6	INV. E01F15/08
X	US 5 685 665 A (LEMBO M CARL [US]) 11 November 1997 (1997-11-11) * figures 3,7 *	1,4	
X	US 6 669 402 B1 (DAVIS C REED [US] ET AL) 30 December 2003 (2003-12-30) * figures 12,13 * * column 3, lines 54-57 *	1,3-10	
X	FR 2 690 937 A1 (EMC2 [FR]) 12 November 1993 (1993-11-12) * figures 2,3 *	1	
X	EP 0 320 565 A2 (SPS SCHUTZPLANKEN GMBH [DE]) 21 June 1989 (1989-06-21) * column 5, lines 20-28 * * figures 1,3,4 *	1,5,6	TECHNICAL FIELDS SEARCHED (IPC) E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 September 2010	Tran, Kim-Lien

CATEGORY OF CITED DOCUMENTS

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01-09-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0244476 A1	06-06-2002	AU 2210602 A	11-06-2002
		US 2004057790 A1	25-03-2004
US 5685665 A	11-11-1997	NONE	
US 6669402 B1	30-12-2003	US 2004146347 A1	29-07-2004
		US 6848857 B1	01-02-2005
FR 2690937 A1	12-11-1993	NONE	
EP 0320565 A2	21-06-1989	DE 3742683 A1	06-07-1989

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Patent documents cited in the description

- IT VR20090079 A **[0049]**