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(54) Closure device, particularly for fastening flaps of a sports shoe

(57) A closure device (1) with easier tensioning, particularly for fastening a first flap (2) and a second flap (3) of a sports shoe (5), which includes a first band (6), which wraps around a quarter (4) of the shoe (5) over a portion of its perimeter and is rigidly coupled thereto in an intermediate point (7). The first band (6) supports, at a first end (9), a first ring (10) inside which a second band (11) slides, the second band (11) being rigidly coupled, at a first end (12), to the first band (6) in a point that is comprised between the intermediate point (7) and a guiding point of the first band (6) on a second ring (14). The second band (11) is associated, at a second free end (13), at the second ring (14) with which the first band (6) is slidingly associated, the second free end (15) of the first band (6) being manually tensionable and fastenable selectively to itself in a removable manner by virtue of a temporary grip means (17,19).

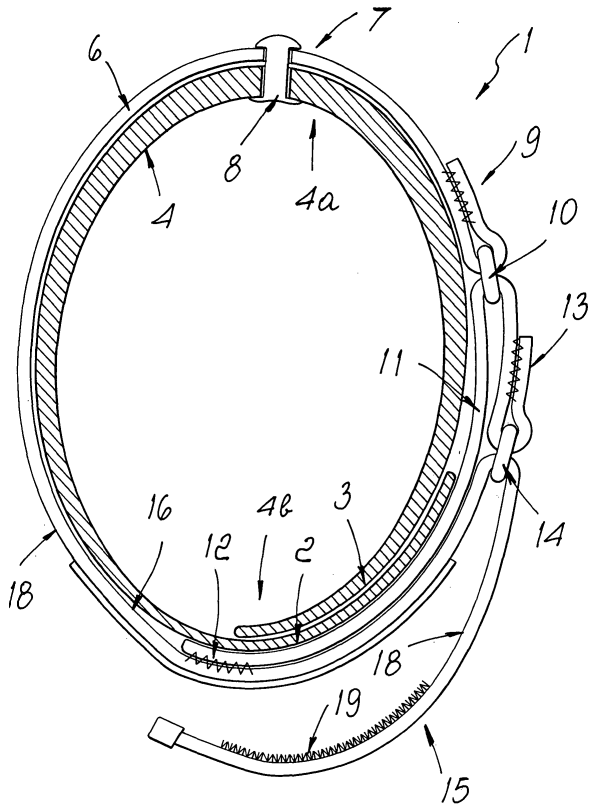

Fig. 4

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Description

[0001] The present invention relates to a closure device, particularly for fastening flaps of a sports shoe.

[0002] Currently it is known to use, in order to fasten the flaps of a shell or cuff of a sports shoe, a first closure device of the type that includes a metallic plate, which is fixed to a first flap of the shoe and is provided with two wings on which a lever arm is pivoted transversely by means of a pivot.

[0003] The end of a connecting member is rotatably associated between the wings of the lever arm and has, at a free end, an engagement member for selective coupling to a rack that is rigidly coupled to a second flap of the shoe.

[0004] Once engagement with the rack has occurred, it is possible to tension the device by turning the lever arm until it lies adjacent to the shell or cuff.

[0005] By virtue of the lever arm, it is possible to achieve a high closure tension of the flaps of the shoe by applying a limited force to the lever arm, making such conventional closure device suitable for shoes subjected to intense stresses during use, such as for example ski boots or skates.

[0006] The main drawback of such conventional first type of closure device is that providing its components is very expensive and requires many process steps.

[0007] Another drawback of such first type of conventional closure device is that it is composed of a large number of components, the assembly of which leads to a high overall cost.

[0008] Another drawback of such first type of closure device is that, in order to contain its overall dimensions and facilitate its placement on the sports shoe, the lever arm has a limited length, thus offering a low multiplication factor for the force applied from outside thereto and making it difficult to tension it, particularly in the case of sports shoes for women or children.

[0009] A second type of conventional closure device for fastening the flaps of a quarter with overlapping flaps of a sports shoe, is constituted by a band that wraps perimetrically around the quarter and is coupled thereto in an intermediate point thereof by means of a rivet.

[0010] The band supports, at a first end, a ring, inside which the band is guided proximate to a second end thereof, which can be fastened to itself detachably by virtue of a temporary grip means, constituted for example by two layers of the material known by the Trademark "Velcro".

[0011] The tensioning of this second type of conventional closure device is performed by pulling the second end of the band which, by virtue of the rivet, generates a force for fastening the two flaps that is approximately equal in intensity to the traction force applied by the user.

[0012] The tension generated on the band, which is approximately equal to the value of the traction applied to its second end in the portion comprised between the second end and the rivet, and approximately equal to twice this value in the portion comprised between the rivet and its first end, provides an additional contribution to the closing force of the two overlapping flaps, mainly due to the effect of the tangential friction between the band and the side wall of the cuff.

[0013] The main drawback of such second type of closure device is that the tension that can be applied stably to the band is limited by the maximum force that can be transmitted from the temporary grip means to the two superimposed faces of the second end of the band, in practice causing the device to be unusable in shoes subjected to intense stresses during use, such as sports shoes.

[0014] The aim of the present invention is to solve the above cited technical problems, eliminating the drawbacks of the prior art, by providing a closure device that allows safe and reliable manual fastening of a first flap and a second flap of a sports shoe, so as to ensure the closure of shoes subjected to intense stresses during their use, such as for example ski boots or skates.

[0015] Within this aim, an object of the invention is to provide a closure device that allows to achieve a high degree of fastening of two overlapping flaps by means of a safe and reliable manual fastening, which can be achieved by applying a low-intensity force on the part of the user.

[0016] Another object is to provide a closure device that is constituted by a small number of components that are easy and cheap to manufacture.

[0017] Another object is to provide a closure device that is structurally simple and has low manufacturing costs.

[0018] This aim and these and other objects that will become better apparent hereinafter are achieved by a closure device, particularly for fastening flaps of a sports shoe, characterized in that it comprises a first band, which wraps around a quarter of the shoe over a portion of its perimeter and is rigidly coupled thereto in an intermediate point, the first band supporting, at a first end, a first ring inside which a second band slides, the second band being rigidly coupled, at a first end, to the first band in a point that is comprised between the intermediate point and a guiding point of the first band on a second ring, and associated, at a second free end, at the second ring with which the first band is slidingly associated, the second free end of the first band being manually tensionable and fastenable selectively to itself in a removable manner by a temporary grip means.

[0019] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figures 1, 2 and 3 are three side views of a closure device according to the invention, applied to a sports shoe;

Figure 4 is a sectional view, taken along a transverse

plane, of the closure device applied to a quarter of a sports shoe in the partial closure or tensioning position;

Figure 5 is a view, similar to Figure 4, of the closure device in the closure position.

[0020] In the examples of embodiment that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other examples of embodiment.

[0021] With reference to the figures cited above, the reference numeral 1 designates a closure device according to the invention for fastening a first flap 2 and a second flap 3, which partially overlap, for example of a quarter 4 of a sports shoe 5, such as for example a ski boot or a roller skate, in-line skate or ice skate.

[0022] The closure device 1 is constituted by a first band 6, which is made for example of a fabric that has high mechanical strength properties and wraps externally around the quarter 4 along at least one portion of its perimeter.

[0023] The first band 6 can have, conveniently, an overall length that exceeds the overall external perimeter of the quarter 4, and is coupled rigidly thereto in an intermediate point 7 thereof by virtue of a connecting member, which is constituted for example by a rivet 8.

[0024] In a preferred but not exclusive embodiment, the intermediate point 7 can be located in a region that lies closer to a first end 9 of the first band 6, which during use is arranged laterally to the quarter 4; by doing so, the rivet 8 affects the quarter at its rear region 4a, for example at the major axis of the approximately elliptical plan shape of the quarter 4.

[0025] As an alternative, the intermediate point 7 can be arranged in a lateral region of the portion of the perimeter of the quarter 4 that is affected by the first band 6, which is approximately comprised between the first end 9 of the first band 6 and the front region 4b of the quarter 4, which is adjacent to the first flap 2 and the second flap 3.

[0026] The intermediate point 7, therefore, increases its distance from the first end 9 of the first band 6 as it is placed further toward the front region 4b of the quarter 4.

[0027] The first band 6 supports, at its first end 9, a first ring 10, made for example of metallic material or plastic material, inside which a second band 11, made of a material similar to the material of the first band 6, is guided slidingly.

[0028] The second band 11 is rigidly coupled, at a first end 12, to the first band 6, and supports at a second end 13 a second ring 14, inside which the second end 15 of the first band 6 is guided.

[0029] The second ring 14 preferably is smaller than the first ring 10, so that it can pass easily within the first ring.

[0030] The first end 12 of the second band 11 is coupled rigidly to the first surface 16, which is internal because it is directed toward the first flap 2, of the first band 6, in a point that lies between the intermediate point 7, for rigid connection between the first band 6 and the quarter 4, and the guiding point of the first band inside the second ring 14.

[0031] According to a preferred but not exclusive embodiment of the closure device 1, the connecting point between the first end 12 of the second band 11 and the first band 6 is arranged at the front region 4b of the quarter 4, in a region affected by the first flap 2 and the second flap 3.

[0032] The second band 11 is thus interposed for a portion, which is adjacent to its first end 12, between the quarter 4 and the first band 6. The second band 11 surrounds externally the perimetric portion of the quarter 4 that is not affected by the first band 6 and is comprised between the guiding point of the first band inside the second ring 14 and the first ring 10, which is rigidly coupled to the first end 9 of the first band 6.

[0033] The second band 11, which is guided at the first ring 10, thus has its second end 13 directed toward the outside of the cuff, like the second ring 14, so as to allow the guiding of the first band 6 toward the front region 4b of the quarter 4 through the second ring 14.

[0034] On the first band 6 there is, proximate to its second free end 15, a means for temporary grip, which is constituted by a first layer 17, made for example of the material known by the Trademark "Velcro" and arranged on a portion of the second surface 18, which is directed away from the second band 11, of the first band 6, preferably approximately at the front region 4b of the quarter 4 when the device 1 is in the closed position, and by a second layer 19, which is made of the same material and is arranged on a portion of the second surface 18 of the first band 6 that is adjacent to the second end 15 of the latter.

[0035] The second free end 15 of the first band 6 can therefore be tensioned manually by the user and can be fastened selectively onto itself in a removable manner by superimposing the first layer 17 and the second layer 19.

[0036] The operation of the closure device with easier tensioning 1 entails that in order to allow the insertion of the foot and of the lower part of the leg of the user inside the sports shoe 5, the second end 15 of the first band 6 is extracted from the second ring 14, which can be made to slide, in turn, within the first ring 10, which is preferably larger, so as to disengage the second band 11 from the first ring.

[0037] In this manner, the closure device 1 is arranged in a first position, also termed fully open position, which is shown in Figure 1; in this position, it is possible to move the two flaps 2 and 3 of the quarter 4 or of the cuff of the shoe 4 mutually apart, so as to facilitate the insertion of the user's foot.

[0038] The second ring 14 can then be made to pass inside the first ring 10, which is preferably larger, so that the second band 11 is guided at the ring, as shown in

Figure 2.

[0039] It is thus possible to insert the second end 15 of the first band 6 inside the second ring 14, so that the second band is guided slidingly therein, as shown in Figure 4; in this second position, also termed partial closure or tensioning position, the first flap 2 and the second flap 3 are conveniently partially mutually overlapped, but no fastening force is applied to them by the closure device 1.

[0040] The closure device 1 can be tensioned manually by the user by applying a traction force at the second end 15 of the first band 6; the stress induced by this force induces, inside the portion of the first band 6 that is comprised between its second end 15 and the rivet 8, a traction whose intensity is approximately equal to the intensity of the applied force.

[0041] By virtue of the ring 14, the second band 11 is actuated, at its second end 13, by a traction force whose intensity, as a first approximation, is deemed approximately equal to twice the force applied by the user to the second end 15 of the first band 6; this traction force is transmitted to the first band at the first end 12 of the second band, which is rigidly coupled to the first band 6.

[0042] The first band 6 is therefore affected, in its portion comprised between the point where it is coupled rigidly to the first end 12 of the second band and the intermediate point for connection between the first band and the quarter 4, by a traction that is equal, as a first approximation, to approximately three times the force applied by the user to the second end 15, which is free, of the first band 6; this traction is then transmitted to the quarter 4 by the rivet 8 at the intermediate point 7.

[0043] The portion of the first band 6 that is comprised between the intermediate point 7 and the first end 9 of the first band is instead affected by a traction which, as a first approximation, is deemed approximately equal to four times the force applied by the user to the second free end 15 of the first band 6; this traction acts on the rivet 8 in the opposite direction with respect to the traction that is present in the portion of the first band that is comprised between the intermediate point 7 and the connecting point between the first band and the first end of the second band.

[0044] The total force accordingly applied to the rivet and thus transmitted to the quarter 4 or cuff of a sports shoe is, if one considers only the traction forces that act on the first and second bands, as a first approximation, approximately equal to the force applied by the user to the second end 15 of the first band 6.

[0045] The first band is, as described above, affected internally by a traction that is equal to a few times the force applied externally by virtue of the force multiplying effect ensured by the presence of the second band 11; this traction, by being transmitted circumferentially to the quarter 4 by friction, thus increases the fastening force of the first and second flaps 2 and 3 of the quarter, which is therefore much higher than the force applied by the user to the second end of the first band.

[0046] It is therefore easily possible to achieve an intense fastening force of the flaps of the quarter 4 or of a cuff of a sports shoe by applying a limited force on the part of the user.

[0047] The use of the closure device with easier tensioning 1 is therefore particularly suitable in shoes for women or children, who would otherwise be unable to achieve on their own, a safe fastening of the shoe, capable of withstanding the stresses imposed by the use of the shoe.

[0048] The closure device 1 is also suitable for use in competitive sports shoes, because it allows to achieve a high closure force.

[0049] Once the intended tensioning of the closure device has been achieved, it is sufficient to fasten onto itself the second end 15 of the first band 6, by mutually superimposing the first layer 17 and the second layer 19 that constitute the temporary grip means; the closure device is therefore in a fully closed position, shown in Figures 3 and 5.

[0050] The temporary grip means must be capable of contrasting the tension applied to the second end 15 of the first band 6, which is much weaker than the tension that acts along the remaining portions of the first band.

[0051] It is thus possible to use, in order to provide the temporary grip means, low-cost materials, such as the product known by the Trademark "Velcro", so as to contain the overall manufacturing costs of the closure device 1.

[0052] It has thus been found that the invention has achieved the intended aim and objects, a device having been provided which allows safe and reliable manual fastening of a first flap and a second flap of a sports shoe, so as to ensure the closure of shoes subjected to intense stresses during their use, such as for example ski boots or skates.

[0053] Another important object achieved by the invention is to allow safe and reliable manual fastening while requiring the application of a low-intensity force on the part of the user.

[0054] Another important object achieved by the invention is that it is constituted by a small number of components that are easy and cheap to manufacture.

[0055] The materials used, as well as the dimensions that constitute the individual components of the invention, may be more pertinent according to the specific requirements.

[0056] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment but can be present per se in many embodiments, including ones that are not illustrated.

Claims

1. A closure device, particularly for fastening flaps of a sports shoe, **characterized in that** it comprises a first band, which wraps around a quarter of said shoe over a portion of its perimeter and is rigidly coupled

thereto in an intermediate point, said first band supporting, at a first end, a first ring inside which a second band slides, said second band being rigidly coupled, at a first end, to said first band in a point that is comprised between said intermediate point and a guiding point of said first band on a second ring, and associated, at a second free end, at said second ring with which said first band is slidingly associated, the second free end of said first band being manually tensionable and fastenable selectively to itself in a removable manner by a temporary grip means.

2. The device according to claim 1, **characterized in that** said first band is rigidly coupled to said quarter by means of a connecting member, which is constituted by a rivet, said first band having an overall length that is greater than the overall external perimeter of said quarter.

3. The device according to claim 2, **characterized in that** said intermediate point is arranged in a region that is closer to a first end of said first band, which during use is arranged laterally to said quarter.

4. The device according to claim 3, **characterized in that** said connecting member is associated with said quarter at a rear region thereof, at the major axis of the approximately elliptical plan of said quarter.

5. The device according to claim 2, **characterized in that** said intermediate point is located in a lateral region of the portion of the perimeter of said quarter that is affected by said first band, said lateral region being comprised approximately between said first end of said first band and the front region of said quarter, which is adjacent to said first and second flaps, the distance of said intermediate point from said first end of said first band increasing as it is arranged toward said front region of said quarter.

6. The device according to one or more of the preceding claims, **characterized in that** said second ring is smaller than said first ring, so as to allow its easy passage inside said first ring.

7. The device according to claim 6, **characterized in that** said first end of said second band is rigidly coupled to a first surface, which is internal because it is directed toward said first flap, of said first band.

8. The device according to claim 7, **characterized in that** the connecting point between said first end of said second band and said first band is located at said front region of said quarter, in a region that is affected by said first and second flaps.

9. The device according to claim 8, **characterized in that** said second band is interposed, with a portion thereof that is adjacent to said first end thereof, between said quarter and said first band.

10. The device according to claim 9, **characterized in that** said second band wraps externally around the perimetric portion of said quarter that is comprised between said guiding point of said first band inside said second ring and said first ring, which is rigidly coupled to said first end of said first band.

11. The device according to claim 10, **characterized in that** said second band wraps externally around the portion of the perimeter of said quarter that is not affected by said first band.

12. The device according to one or more of the preceding claims, **characterized in that** said second band is guided at said first ring toward the outside of the cuff, so as to allow the guiding of said first band toward said front region of said cuff through said second ring.

13. The device according to claim 12, **characterized in that** said temporary grip means is arranged on said first band proximate to said second free end thereof and is constituted by a first layer, made of a material of the type known by the Trademark "Velcro", arranged on a portion of said first band that is directed away from said second band.

14. The device according to claim 13, **characterized in that** said first layer is arranged approximately at said front region of the quarter when said device is in the closure position.

15. The device according to claim 14, **characterized in that** said temporary grip means comprises a second layer, made of a material of the type known by the Trademark "Velcro", which is arranged on a portion of said first band that is adjacent to said second end of said band, said second free end of said first band being tensionable manually by the user and being fastenable selectively onto itself in a removable manner by overlapping said first layer and said second layer.

16. The device according to one or more of the preceding claims, **characterized in that** said first and second bands are made of a fabric that has high mechanical strength properties.

17. The device according to one or more of the preceding claims, **characterized in that** said first and second rings are made of metallic material or plastic material.

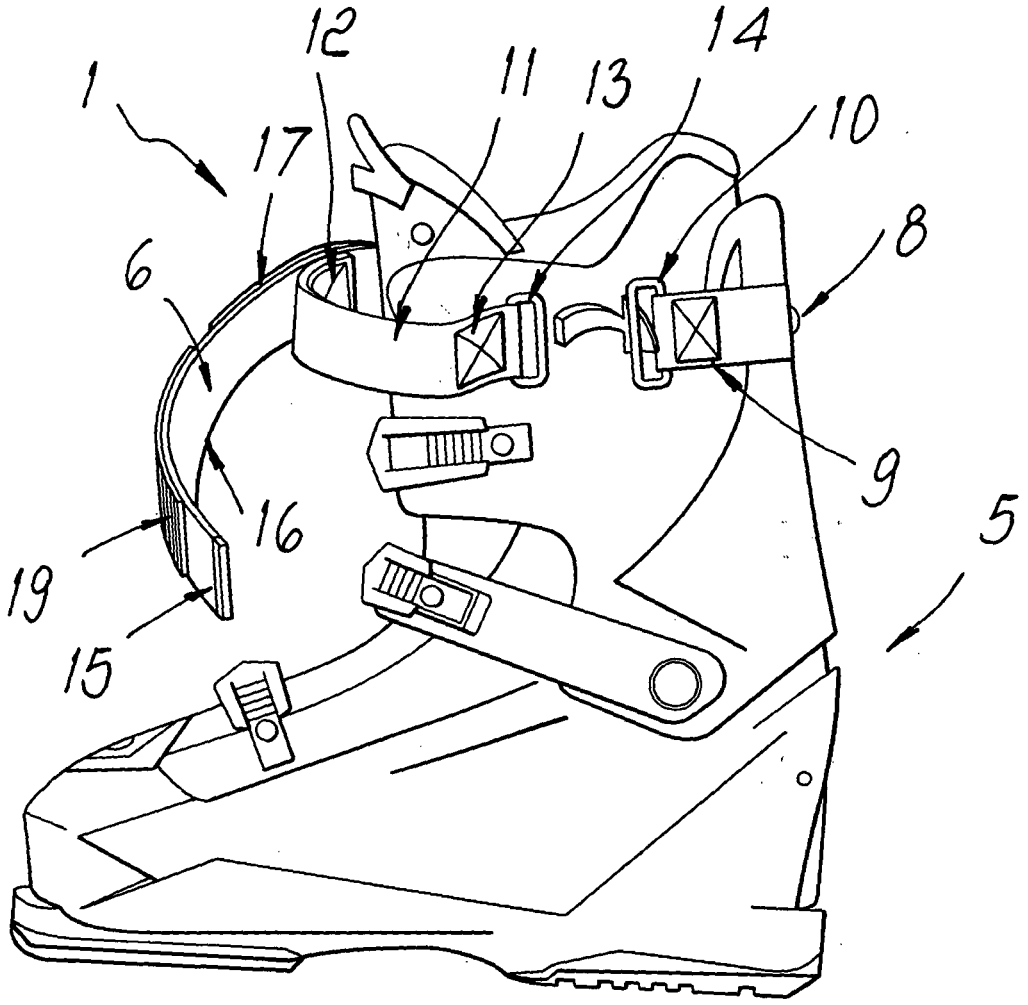

Fig. 1

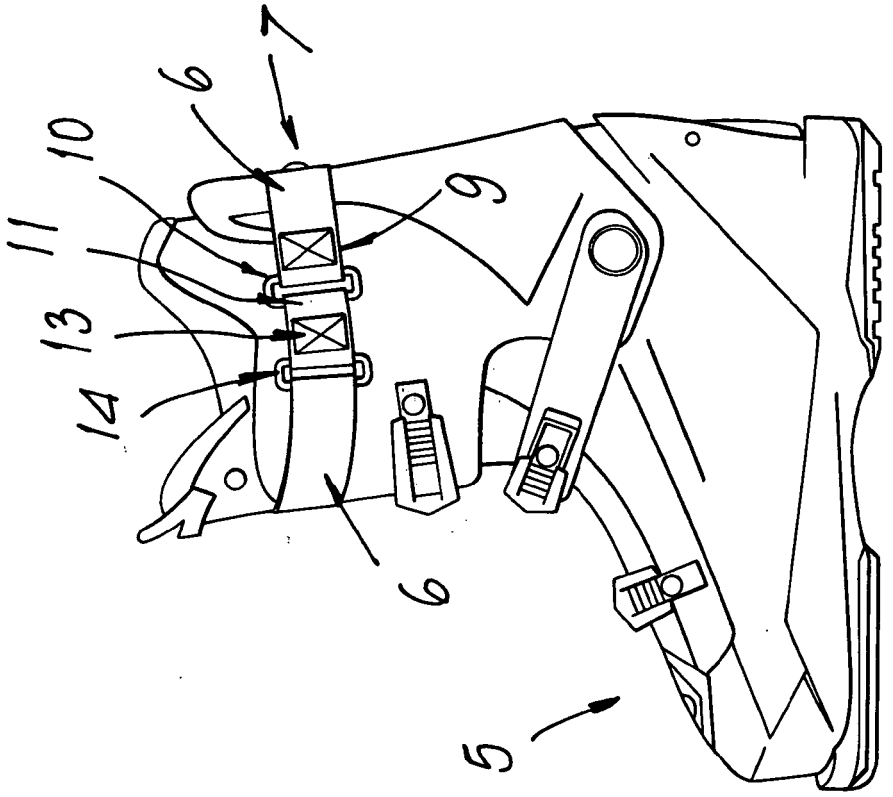

Fig. 3

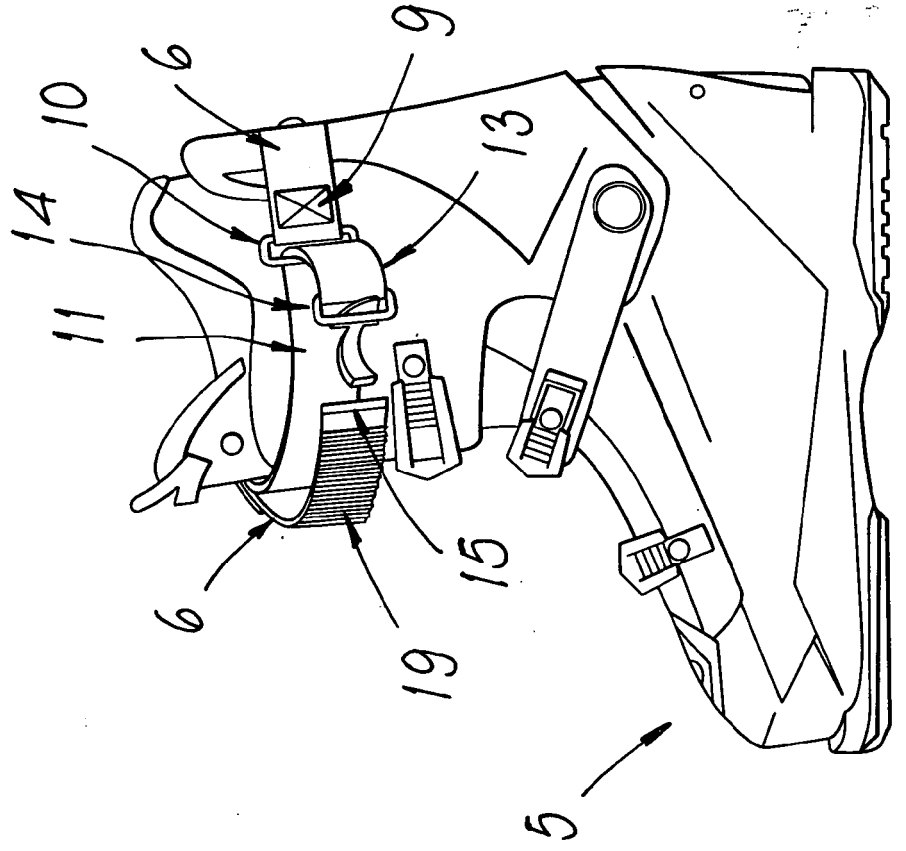

Fig. 2

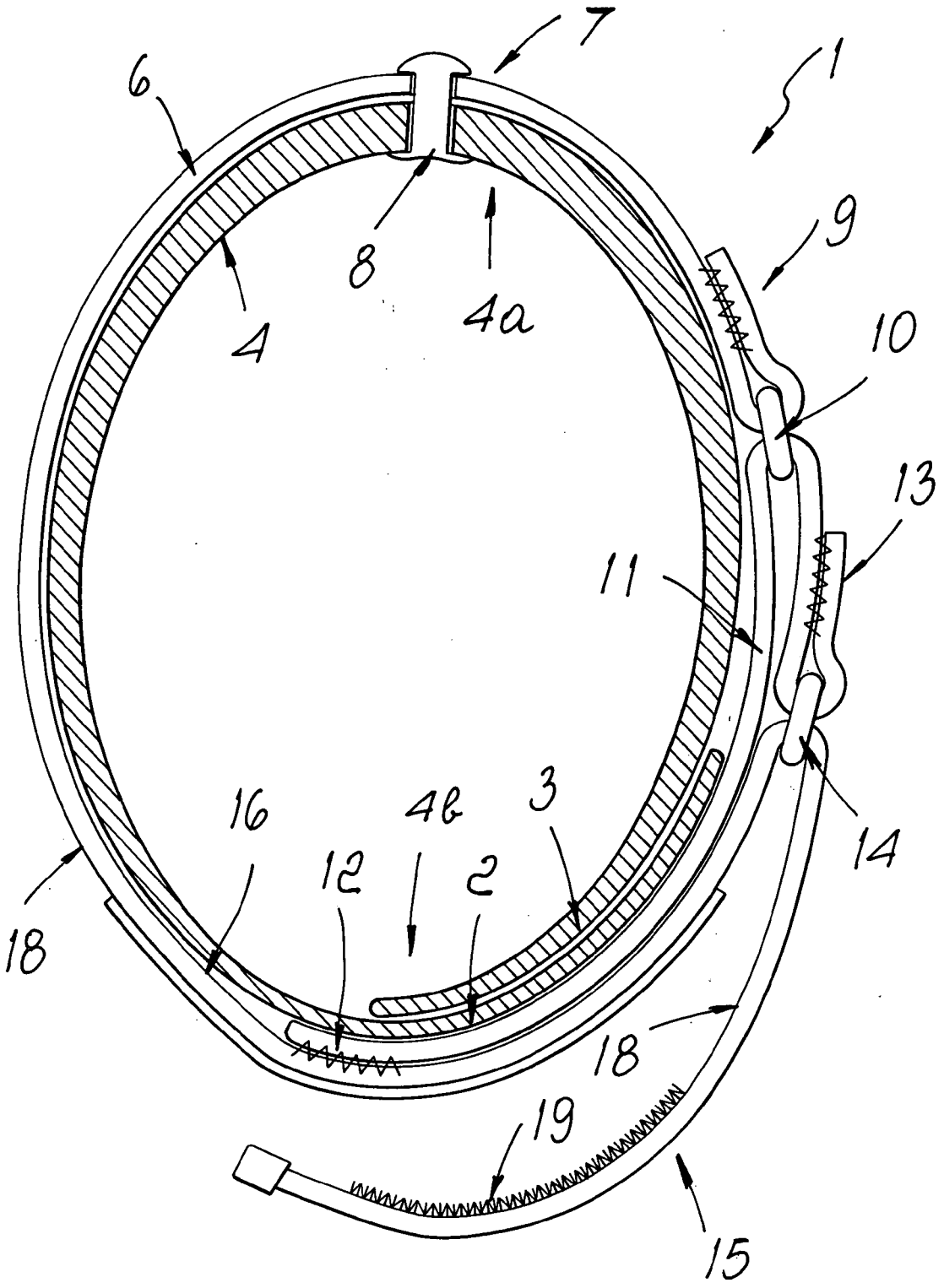

Fig. 4

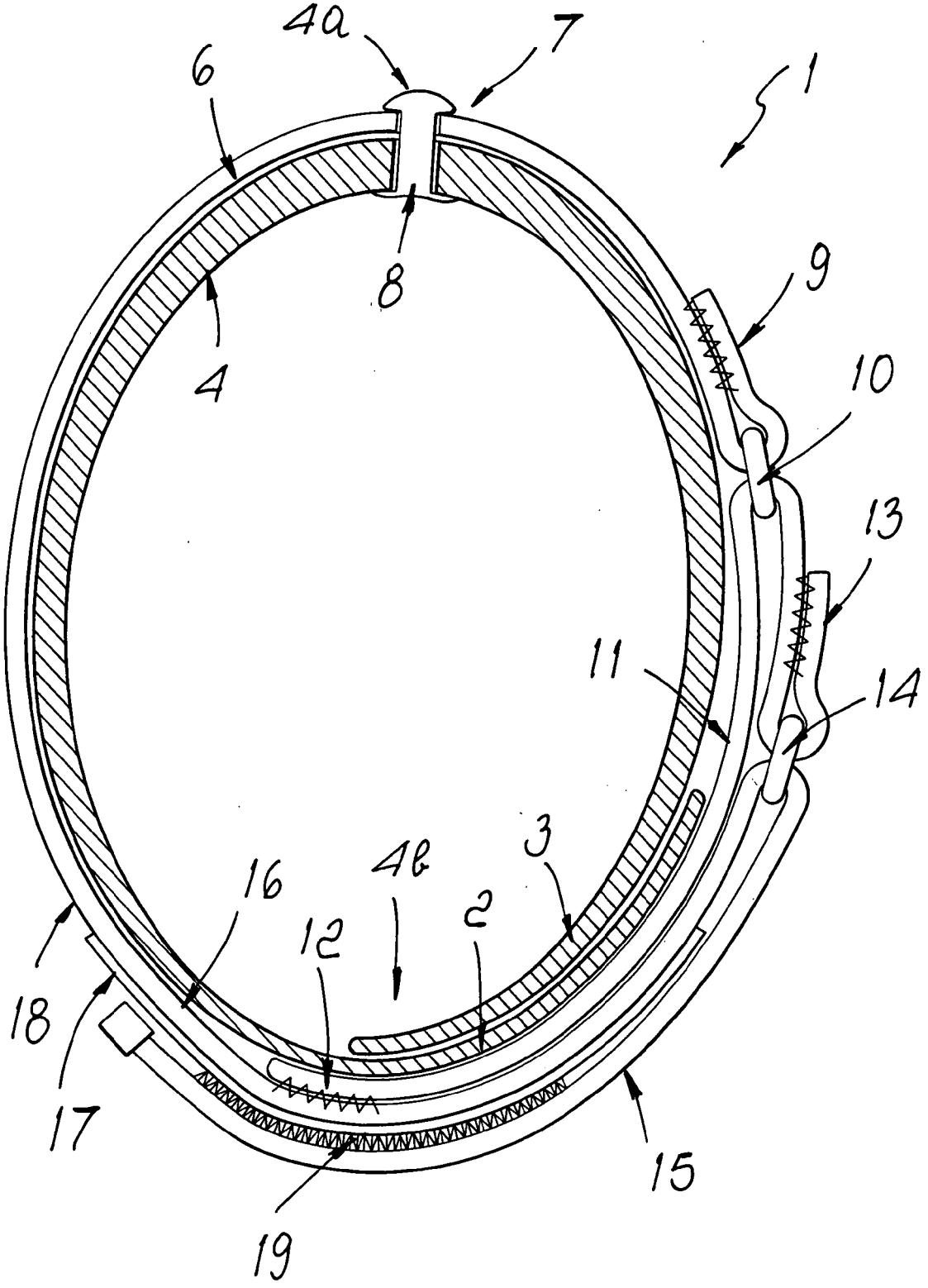

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 05 01 8882

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 0 733 312 A (SHIMANO INC) 25 September 1996 (1996-09-25) * column 2, line 53 - column 3, line 50; figures *	1	A43C11/14
A	US 6 467 193 B1 (OKAJIMA SHINPEI) 22 October 2002 (2002-10-22) * column 6, lines 3-29; figures 5-8 *	1	
A	US 2003/182715 A1 (WALLACE SCOT) 2 October 2003 (2003-10-02) * the whole document *	1	
A	US 6 026 594 A (FOUGERE ET AL) 22 February 2000 (2000-02-22) * figures 6-8 *	1	
A	EP 0 573 389 A (LANGE INTERNATIONAL S.A) 8 December 1993 (1993-12-08) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (IPC)

A43C
A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 January 2006	Herry, M

CATEGORY OF CITED DOCUMENTS

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02-01-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0733312 A	25-09-1996	DE 69611849 D1	05-04-2001
		DE 69611849 T2	04-10-2001
		JP 2756650 B2	25-05-1998
		JP 8256802 A	08-10-1996
		US 5727337 A	17-03-1998
US 6467193 B1	22-10-2002	NONE	
US 2003182715 A1	02-10-2003	NONE	
US 6026594 A	22-02-2000	AT 305238 T	15-10-2005
		AU 4687899 A	05-01-2000
		CA 2335698 A1	23-12-1999
		DE 69927499 D1	03-11-2005
		EP 1087676 A1	04-04-2001
		JP 2002518068 T	25-06-2002
		WO 9965348 A1	23-12-1999
EP 0573389 A	08-12-1993	AT 142086 T	15-09-1996
		CH 686483 A5	15-04-1996
		DE 69304426 D1	10-10-1996
		DE 69304426 T2	06-03-1997

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