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(54) Fastening device, particularly for sports shoes

(57) A fastening device particularly usable in sports shoes (1) includes a band (7), a first fixed end (8) of which is associated with a ring (10) that cooperates with the second movable end (9) of the band in order to guide it. A first means (14) is rotatably associated with the ring, which acts as a guide for the second movable end of the band, and is adapted to limit the friction between the band and the ring. There is also a second (15) means for increasing friction with the band.

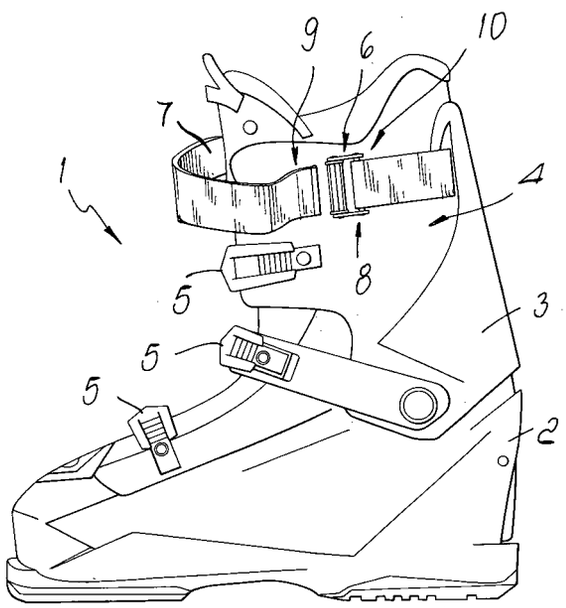

Fig. 1

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Description

[0001] The present invention relates to a fastening device particularly for sports shoes, such as for example ski boots.

[0002] It is known to manufacture ski boots that have a first flap and a second flap to be fastened at the shell and at the quarter articulated thereto.

[0003] The flaps are fastened together by levers arranged transversely to the shell and/or the quarter so as to fasten the shoe around the metatarsal region of the foot and/or the lower part of the leg of the user.

[0004] In combination with the use of these levers, it is also known to use at least one fastening band that is transversely associated with the quarter, preferably at a region thereof that is arranged at the level of the tibia.

[0005] Such band, usually made of plastics, is provided with a grip means of the type commonly known by the trademark "Velcro", which provides a coupling produced by overlapping.

[0006] Such band is therefore arranged around the quarter so as to have a first fixed end and a second movable end that can be mutually connected by means of a metallic ring, which is usually made of steel and has an approximately rectangular plan shape.

[0007] In greater detail, the first fixed end of the band is associated with one side of the metal ring, while the second movable end of the band is inserted at the opposite side thereof.

[0008] In this manner, the metallic ring allows to guide the second movable end, which can therefore be pulled by the user toward the region arranged opposite the first fixed end of the band.

[0009] The guiding of the second end of the band on the ring allows to tension the band as a consequence of the sliding of a portion thereof at the respective side of the metallic ring.

[0010] Once the intended fastening has been achieved, the band is locked by overlapping the second movable end on a respective adjacent portion of the band, so as to allow their coupling.

[0011] A first drawback that is observed in such conventional type of fastening band is the fact that the activation of the bands is very troublesome for the user, because the sliding with respect to the metallic ring is greatly hindered by the friction that occurs between the parts arranged in mutual contact.

[0012] A further drawback is that the locking of the band is often inaccurate, because unexpected slippages can occur between the band and the metallic ring.

[0013] A further important drawback is that the band can deteriorate and wear rapidly due to the friction that hinders the sliding of the band with respect to the metallic ring.

[0014] The aim of the present invention is therefore to solve the drawbacks noted above and therefore solve the described technical problems by providing a fastening device that can be used easily and at the same time allows to achieve precise closure of the shoe around the respective region of the foot or of the lower part of the leg.

[0015] An object is to provide a fastening device that allows to perform rapidly and safely the guiding and subsequent locking of a band.

[0016] A further object is to provide a fastening device that is reliable over time and is not subject to deterioration or rapid wear.

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

[0018] This aim, these objects and others that will become better apparent from the description that follows are achieved by a fastening device, as claimed in the appended claims.

[0019] Other objects will become better apparent in the description that follows, which must be considered together with the accompanying drawings, which illustrate only by way of non-limitative example a particular embodiment, which is illustrated by way of non-limitative example in the accompanying drawings, wherein:

Figures 1 to 3 are side views of a sports shoe provided with a fastening device according to the invention;
Figure 4 is a front view of the fastening device according to the preceding figures;
Figure 5 is a sectional view of the fastening device, taken along the line V-V of Figure 4;
Figure 6 is a sectional view of the guiding ring, taken along a longitudinal plane;
Figure 7 is a sectional view of the guiding ring, taken along the line VII-VII of Figure 6;
Figure 8 is a bottom view of the guiding ring according to the preceding figures;
Figure 9 is a view of a detail of Figure 6.

[0020] With reference to the cited figures, and bearing in mind that they exemplify a particular embodiment and are in variable scale and that individual reference numerals designate identical or equivalent parts therein, the reference numeral 1 designates a sports shoe, such as for example a ski boot, which includes a shell 2 to which a quarter 3 is pivoted approximately at the malleolar region.

[0021] The shell 2 and the quarter 3 have a first flap 4 and a second flap, not shown, which can be mutually connected for example by partial overlap in the metatarsal and instep region.

[0022] The fastening of the first flap 4 and of the second flap around the foot and the lower part of the leg of the user is performed by activating levers, of a per se known type, each designated by the reference numeral 5, and a fastening device according to the invention, generally designated by the reference numeral 6.

[0023] The device includes a band 7, made for example of plastics, which has a first male layer at one surface and a second female layer at the opposite surface, both

of the type commonly known by the trademark "Velcro", so that they can be mutually coupled by overlapping.

[0024] The band 7 is arranged transversely to the quarter 3, so as to surround the quarter, for example at the region of the tibia, and has a first fixed end, designated by the reference numeral 8, and a second movable end, designated by the reference numeral 9.

[0025] The first fixed end 8 of the band 7 is rigidly coupled to the first flap 5 and at the same time is associated with a ring 10 which is preferably metallic and is allowed to cooperate with the second movable end 9, so as to allow its guiding.

[0026] In greater detail, the ring 10 has a preferably rectangular shape and is constituted by a pair of spacer shoulders or linkages, generally designated by the reference numeral 11, that are mutually parallel. A first pivot 12 and a second pivot 13 are associated transversely, for example by riveting with the ends of the shoulders 11. The pivots are arranged at a preset distance from each other and approximately at right angles to the spacer shoulders or linkages 11.

[0027] The first fixed end 8 of the band 7 is associated with the first pivot 12, and a first means for limiting the friction between the band 7 and the ring 10 is rotatably associated with the second pivot 13; the means is preferably constituted by a roller 14, which is arranged coaxially with respect to the second pivot 13 so as to be freely pivoted with respect to the pivot.

[0028] The roller 14 has a circular annular transverse cross-section and an approximately I-shaped longitudinal cross-section.

[0029] The roller 14 is provided with a second means, suitable to increase the friction with the band 7, which is preferably constituted by a plurality of protrusions 15 which protrude radially and longitudinally with respect to the outer surface 16 of the roller 14.

[0030] Figures 1 to 3 show how it is possible to insert manually the second movable end 9 through the gap between the first pivot 12 and the roller 14, so as to allow, by pulling manually the second end 9, the subsequent guiding of the end toward the region directed away from the first fixed end 8.

[0031] Pulling the second movable end 9 toward the region directed opposite with respect to the first fixed end 8 causes an equal sliding of the band 7 with respect to the second pivot 13, so as to achieve the intended fastening between the first flap 4 and the second flap of the quarter 3 due to the tensioning thus received by the band 7.

[0032] The sliding of the band 7 with respect to the second pivot 13 is matched by an equal rotation of the roller 14 about the pivot 13.

[0033] This is due to the fact that the protrusions 15 of the roller 14 perform an antislip action for the respective portion of the band 7 that is temporarily rested at the outer surface 16 of the roller 14, consequently entraining it in rotation.

[0034] The rotation of the roller 14 about the second pivot 13 occurs easily, since the friction produced between the parts arranged instantaneously in contact is very small, for example by applying lubricants or by using suitable materials.

[0035] Respective first annular ridges, designated by the reference numeral 17, protrude radially at the ends of the outer surface 16 of the roller 14, and contain and guide the band 7 during its sliding with respect to the second pivot 13.

[0036] Second annular ridges 18 protrude axially at the ends of the outer surface 16 of the roller 14, preferably in a region adjacent to the lateral surface of the second pivot 13, and are arranged approximately at right angles to the first ridges 17.

[0037] The function of the second annular ridges 18 is to reduce the friction of the roller 14 also in relation to the facing surfaces of the spacer shoulders or linkages 11.

[0038] Once the intended fastening between the first flap 4 and the second flap is achieved, by overlapping the second movable end 9 on a respective adjacent portion of the band 7 it is possible to produce the coupling between the female layer and the male layer thereof, so as to provide the temporary locking of the band 7.

[0039] It has thus been shown that the described solution has achieved the intended aim and objects, a fastening device having been provided which allows to obtain easily a precise closure of the corresponding region of the shoe, because the application of the roller at the second pivot drastically reduces the friction between the band and the ring and at the same time prevents the sliding and slipping of the band with respect to the ring once the intended mutual fastening of the first and second flaps has been achieved.

[0040] The roller also allows to avoid or at least reduce drastically the wear of the band, both by way of the drastic reduction of the friction that occurs between the band and the ring and because the diametrical dimension of the roller gives the band a larger contact surface.

[0041] The materials and the shape or the dimensions of the individual components of the described embodiment may of course vary according to specific requirements.

[0042] 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.

[0043] Anything found to be already known during the patenting process is understood not to be claimed and to be the possible subject of a disclaimer.

Claims

1. A fastening device, particularly for sports shoes, comprising a band, a first fixed end of which is associated with a ring that cooperates with the second

movable end of said band in order to guide it, **characterized in that** a first means is rotatably associated with said ring for guiding said second movable end and is adapted to limit the friction between said band and said ring, provided with a second means adapted to increase friction with said band.

2. The fastening device according to claim 1, wherein said ring has an approximately rectangular plan shape and is constituted by two mutually parallel spacing shoulders or linkages, with the ends of which a first pivot and a second pivot are transversely associated, said pivots being arranged at a preset mutual distance and approximately at right angles to said spacing shoulders or linkages, said first fixed end being associated with said first pivot of said ring.

3. The device according to claims 1 or 2, **characterized in that** said first means adapted to limit the friction between said band and said ring is constituted by a roller that has circular annular transverse cross-section and an approximately I-shaped longitudinal cross-section.

4. The device according to claim 3, **characterized in that** said roller is arranged coaxially to said second pivot of said ring, so as to be pivoted freely with respect to said second pivot.

5. The device according to claim 3, **characterized in that** said second means adapted to increase friction with said band is constituted by a plurality of protrusions that protrude radially and longitudinally with respect to the outer surface of said roller.

6. The device according to one or more of the preceding claims, **characterized in that** the sliding of said band with respect to said second pivot of said ring is matched by an equal rotation of said roller about said second pivot.

7. The device according to one or more of the preceding claims, **characterized in that** said protrusions have an antislip action on the respective portion of said band that is rested temporarily at the outer surface of said roller, consequently entraining it in rotation.

8. The device according to claim 3, **characterized in that** lubricants or appropriate materials, suitable to decrease friction with respect to said ring, are applied to said roller.

9. The device according to one or more of the preceding claims, **characterized in that** respective annular ridges protrude radially at the ends of said roller and are adapted to contain and guide said band during the sliding of said band with respect to said second pivot.

10. The device according to one or more of the preceding claims, **characterized in that** second annular ridges protrude axially at the ends of said roller, in a region located adjacent to the lateral surface of said second pivot, and are arranged approximately at right angles to said first ridges.

11. The device according to claim 10, **characterized in that** said second annular ridges reduce the friction of said roller with respect to said facing surfaces of said spacing shoulders or linkages.

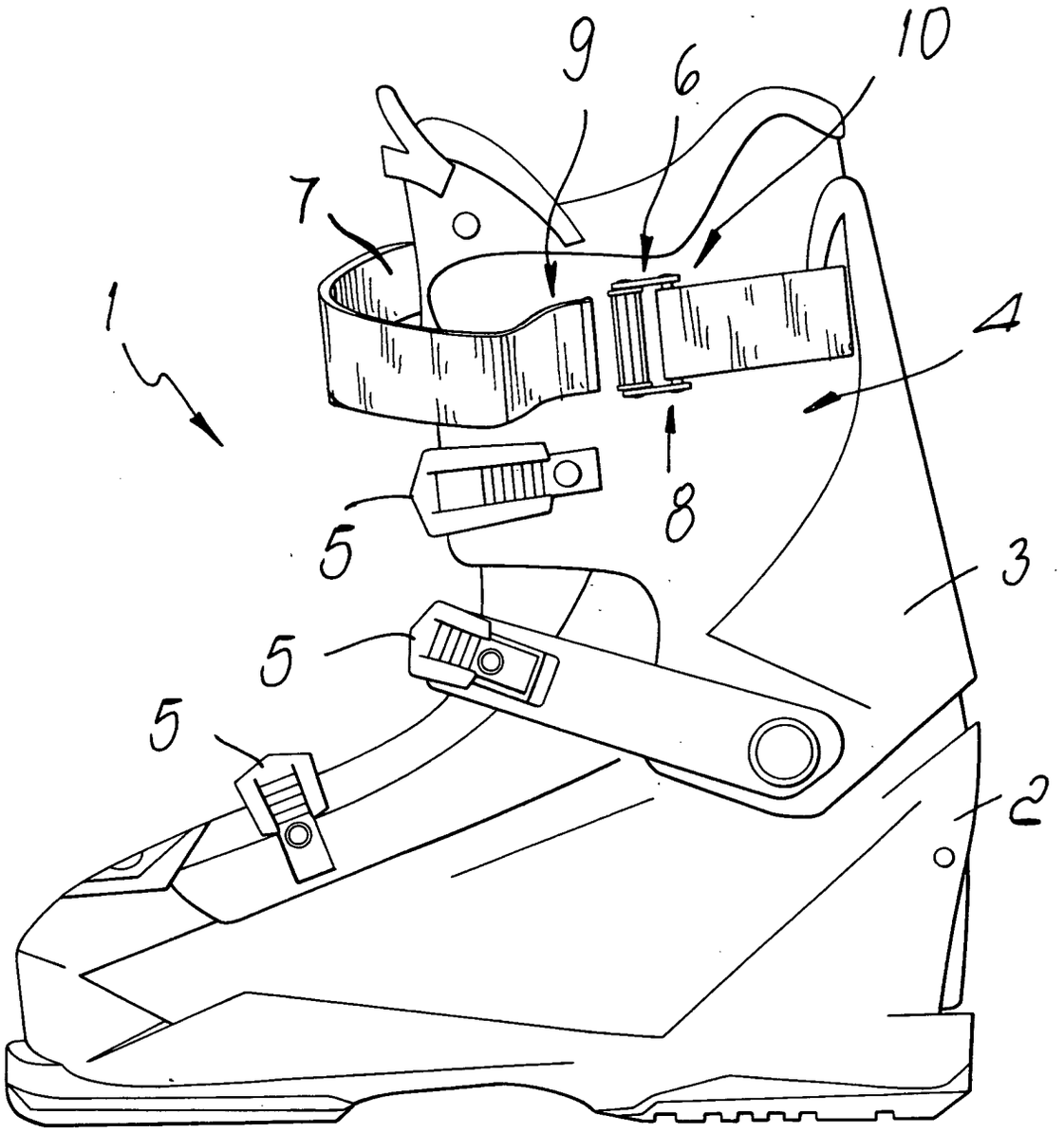

Fig. 1

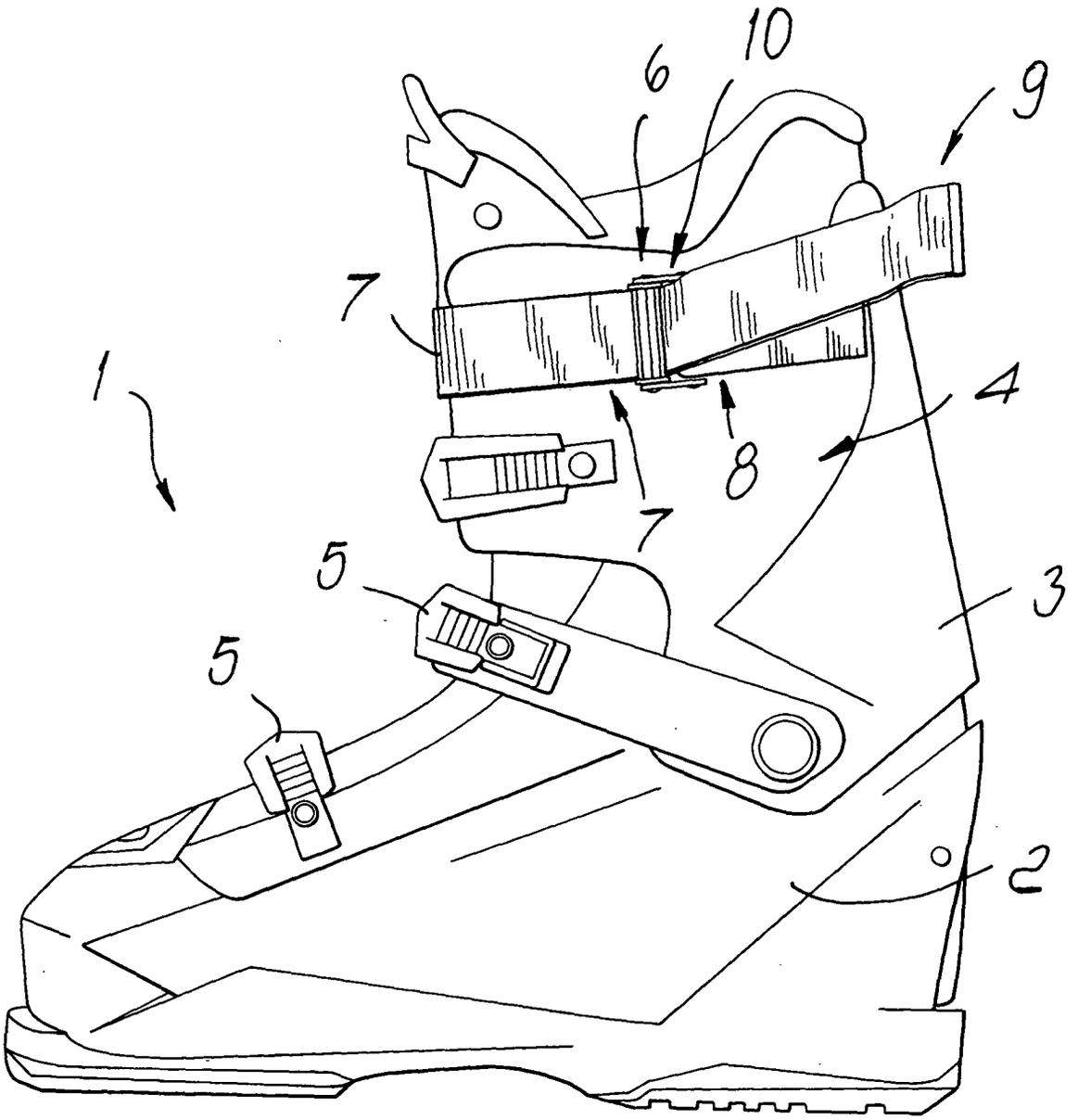

Fig. 2

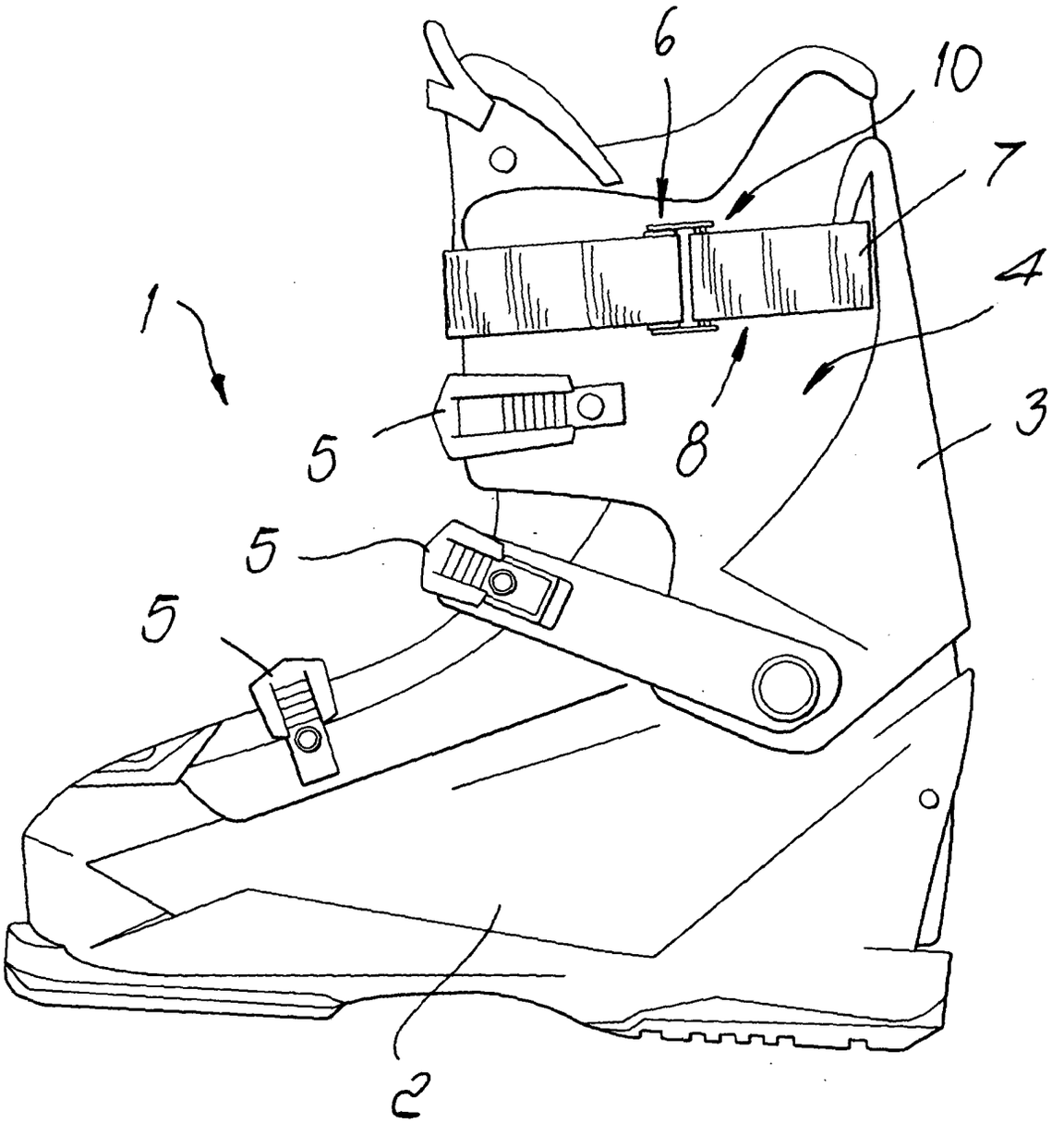

Fig. 3

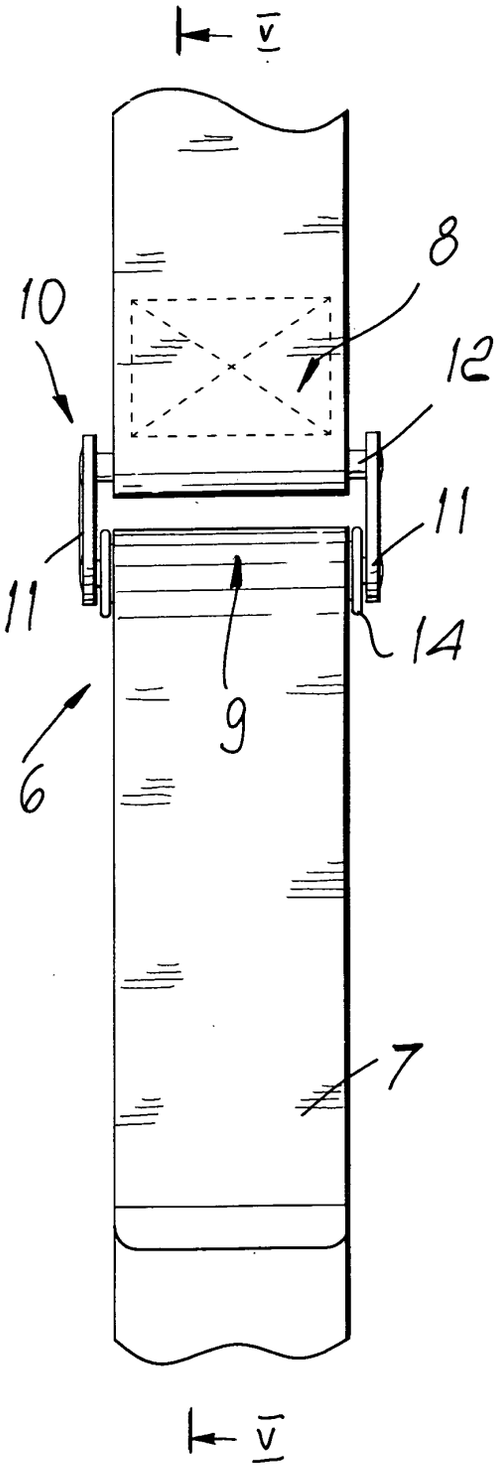

Fig. 4

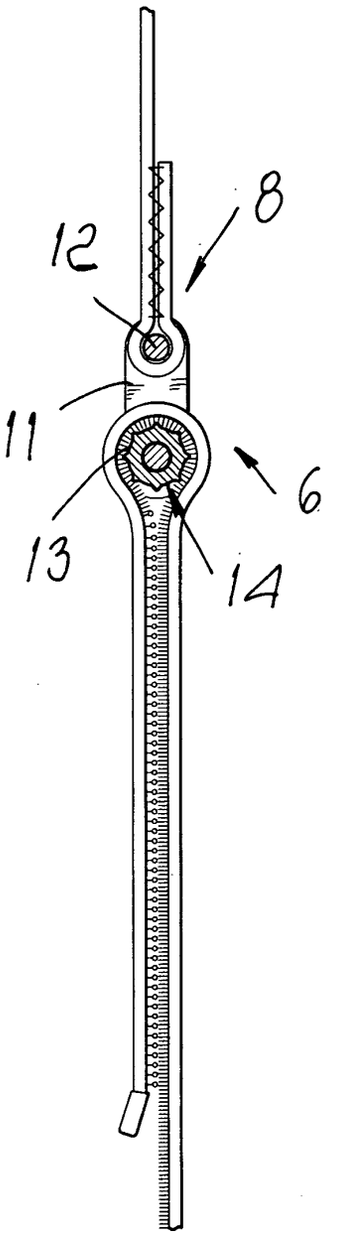

Fig. 5

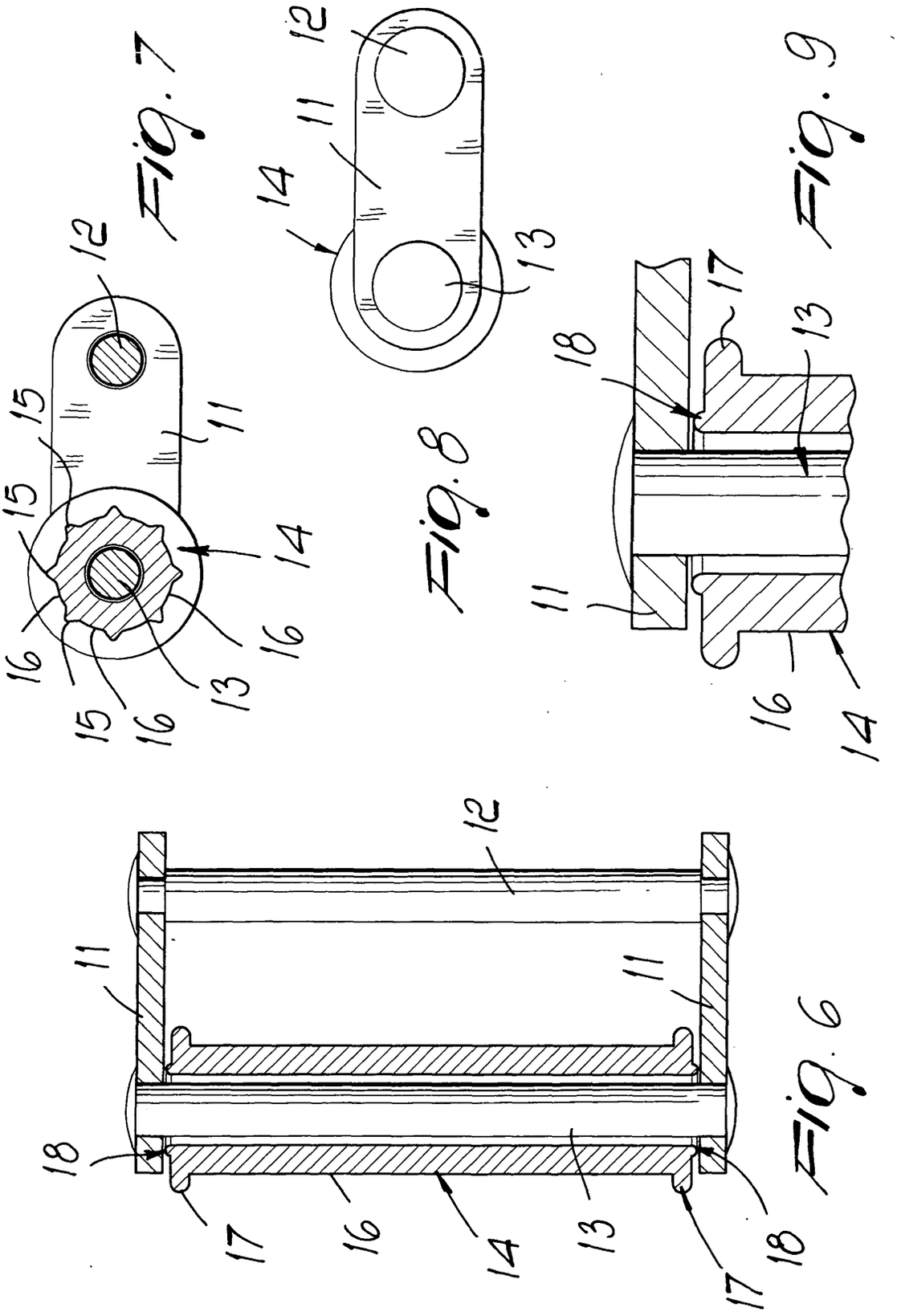

Fig. 6

Fig. 7

Fig. 8

Fig. 9

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EUROPEAN SEARCH REPORT

Application Number
EP 03 01 4374

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	2 March 2004	Herry, M

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