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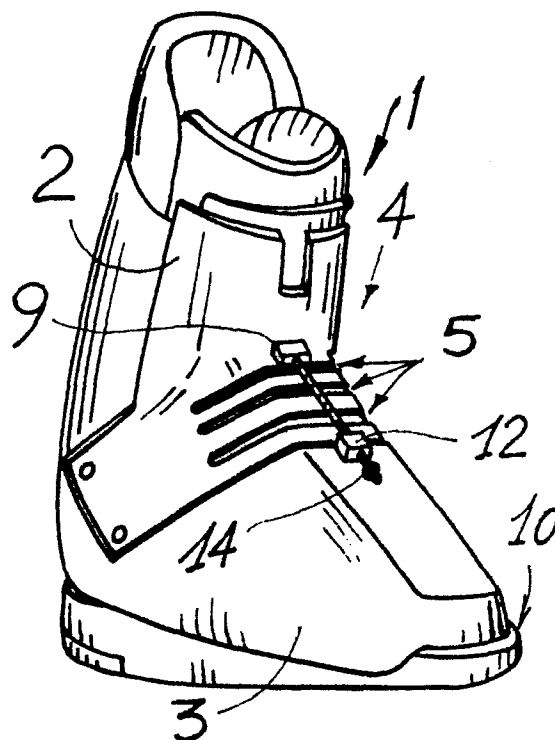
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I-20123 Milan(IT)(54) **Ski boot with device for the adjustment of the degree of flexibility and inclination.**

(57) The present invention relates to a ski boot (1) with device for the adjustment of the degree of flexibility and inclination, comprising a shell (3,103) and a front quarter (2,102), the front quarter (2,102) being rigidly associated with the shell (3,103) and having a flexing region (4,104) arranged in the foot instep region, the flexing region having an upper section (9,105a) and a lower section (12,105b) and being provided with at least one transverse slot (5,105) arranged between the upper section and the lower section; the boot furthermore comprises a connecting rod (6,106) between the upper section (9,105a) and the lower section (12,105b) and means (14,114) for the adjustment of the working length of the rod (6,106) to vary the maximum span of said at least one slot (5,105).



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SKI BOOT WITH DEVICE FOR THE ADJUSTMENT OF THE DEGREE OF FLEXIBILITY AND INCLINATION

The present invention relates to a ski boot provided with a device for the adjustment of the degree of flexibility and inclination. Many types of boots are currently known which are provided with means adapted to allow the forward flexibility of the front quarter.

For example, ski boots are known which are provided, at the front quarter and transversely with respect thereto, with a plurality of slots.

Said slots are obtained at the region of the instep of the foot, said region being the one affected in the forward flexing phase.

The subsequent closing, during flexing, of the span of each slot allows to achieve a gradual flexibility.

The various solutions claimed therein, though undoubtedly valid, have the disadvantage for the user of not being able to adjust the degree of flexibility and inclination according to the immediate and specific requirements.

The aim of the present invention is therefore to eliminate the disadvantages described above, by devising a ski boot having a device which allows to adjust the degree of forward flexibility of the front quarter together with its degree of inclination according to the immediate specific requirements of the skier.

Within the scope of the aim described above, another important object is to provide a ski boot with a device which associates with the preceding characteristic that of providing a rearward rigidity of the boot.

Another important object is to obtain a boot with a device which, besides being structurally simple, allows an immediate detection of the selected degree of flexibility.

Not least object is to devise a boot with a device which is easily obtainable from elements and materials commonly available on the market and which is furthermore capable of giving the greatest reliability and safety in use.

The aim and the objects described above, as well as others which will become apparent hereinafter, are achieved by a ski boot with device for the adjustment of the degree of flexibility and inclination, comprising a shell and a front quarter, said front quarter being associated with, or articulated to, said shell and being provided with a flexing portion arranged at the foot instep region, said flexing portion having an upper section and a lower section and being provided with at least one transverse slot arranged between said upper section and said lower section, characterized in that it

comprises a connecting rod between said upper section and said lower section and means for the adjustment of the working length of said rod to vary the maximum span of said at least one slot.

Further characteristics and advantages of the invention will become apparent from the following detailed description of two particular embodiments, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

fig. 1 is a lateral elevation view of the boot with the adjustment device according to the invention;

fig. 2 is a detail view of said device;

fig. 3 is a view of the device along a longitudinal middle cross section plane;

fig. 4 is an exploded view of the components of the boot;

fig. 5 is a partially cutout lateral view of a boot with the device according to another aspect of the invention; and

fig. 6 is a view of the device of fig. 5 along a longitudinal middle cross section plane.

With reference to figures 1-4, a rear-entry ski boot 1 comprises a front quarter 2 rigidly associated with a shell 3 and provided, at the region 4 of flexing of the instep of the foot, with a plurality of slots 5 arranged transversely with respect to said quarter. A rod 6 is furthermore arranged at the region 4 approximately at the longitudinal middle axis of the front quarter 2.

Said rod 6 is provided with a first end 7 pivoted to a pivot 8 arranged inside, and rigidly associated with, a first connecting element 9 which is rigidly associated at the front quarter 2, or obtained by molding the same, proximate to the first of the slots 5 provided thereon towards the tip 10 of the boot 1.

The rod 6 is longer than the extension of the region 4 affected by the slots 5; the second end 11 of the rod is threaded and slideably associated with a second element consisting of a small block 12, rigidly associated with the shell 3 and provided with a through seat 13 for said end 11, and provided longitudinally with respect to the shell 3.

The inner diameter of the seat 13 is much greater than the diameter of the end 11 of the rod.

A ring 14 is associated with the portion of said end 11 which protrudes from the block 12, and is preferably provided with a knurled lateral surface; the ring 14 abuts with the block 12.

Advantageously, the shell 3 is provided with a flap 15 which projects above it and embraces the tibial region of the foot; a gasket 16 is arranged above the elastically deformable flap in order to form a seal against infiltrations of water.

The use of the device is the following: by rotating the ring 14 it is possible to progressively close the span of the slots 5 since the connecting element 9 moves closer to the small block 12.

In order to facilitate this movement, a slot 17 is provided on the first connecting element 9 for the insertion, during assembly, of the rod 6, and provided with an axis approximately perpendicular to the plane of arrangement of the slots 5. This slot furthermore allows the oscillation of said rod, allowing a correct positioning as the span of the slots is reduced.

It is thus possible to adjust the degree of flexibility together with the degree of inclination of the quarter 2 according to the specific requirements and to the contingent situations for each athlete.

It should be stressed that by closing the span of the slots 5 the inclination of the quarter 2 is also varied, obtaining the extreme conditions of a flexible but scarcely inclined boot and those of a rigid but very inclined boot.

Such conditions are correct from a technical point of view for an optimum practice of skiing.

The sliding of the end 11 within the seat 13 of the block 12 allows the further closure of the span of the slots 5 during forward flexing.

Furthermore, the rearward inclination of the quarter is limited by the fact that the ring 14 abuts with the small block 12.

Figures 5-6 illustrate a device for the adjustment of the degree of flexibility and inclination according to another aspect of the invention. A boot 101 comprises a shell 103 whereto is rigidly connected a front quarter 102 having a region 104 for the flexing of the instep of the foot provided with a slot 105. The slot 105 is arranged transversely with respect to the region 104 so as to allow an elastic deformation of said region 104 and therefore the inclination of the upper section of the quarter 102, as illustrated in broken lines in figure 5.

A rod 106 connects the two opposite faces 105a and 105b of the slot 105 and is arranged substantially at the longitudinal middle plane of the boot 101.

The upper end of the rod 106 is loosely inserted in a hole 117 provided on the face 105a and is provided with an abutment 107 which prevents the face 105a from moving upwards with respect to the rod 106 but allows its downward translatory motion.

The lower portion of the rod 106 is threaded and is engaged by a ring 114 which is advantageously provided with a knurled outer surface to facilitate its rotation on the part of the user.

The ring 114 is accommodated in a semicylindrical seat 112 provided at the face 105b so that it can rotate about the longitudinal axis of the rod 106, through any translatory motion thereof with respect to the face 105b is prevented.

The operation of the device is as follows: by rotating the ring 114 the rod 106 is axially moved; if, with reference to the figures, upon a rotation of the ring the rod 106 is moved downwards, the abutment 107 acts on the inner side of the face 105a moving it downwards, thus progressively closing the span of the slot 105 and inclining forwards the quarter 102.

By rotating the ring 114 in the opposite direction, the rod 106 is moved upwards, allowing the elastic rearward return of the quarter, the abutment 107 determining the maximum possible rearward inclination of the quarter 102.

Naturally, the dimensions of the threaded portion of the rod 106 are proportioned to the dimensions of the slot 105, and in particular to the maximum and minimum dimensions of the span of said slot, that is to say, to the desired degree of adjustment.

Furthermore, the diameter of the hole 117 is greater than the outer diameter of the rod 106, this allowance in the coupling between the rod 106 and the face 105a allows an inclination of the rod 106 with respect to the face 105a upon the variation of the span of the slot.

As described, by progressively closing the slot 105 the forward inclination of the quarter is increased and the flexibility is decreased at the same time; once the inclination of the quarter has been selectively set, said quarter is prevented from inclining backwards with respect to the preset position but not from inclining itself further forwards since the face 105a can move forwards, with respect to the rod 106, but not backwards due to the abutment 107.

It has thus been observed that the invention achieves the aim and the objects described above, a ski boot having been designed with a device which allows to adjust the degree of forward flexibility and inclination of the front quarter, according to the specific requirements of the skier, furthermore achieving the rearward rigidity of the boot. The device moreover allows to immediately visualize the selected degree of flexibility, since the skier can relate the same to the span of the slots.

Naturally the materials and the dimensions of the components of the boot may be any, according to the specific requirements.

Claims

1. Ski boot with device for the adjustment of the degree of flexibility and inclination, comprising a shell (3,103) and a front quarter (2,102), said front quarter (2,102) being associated with said shell (3,103) and being provided with a flexing portion (4,104) arranged in the foot instep region, said flexing portion (4,104) having an upper section (9,105a) and a lower section (12,105b) and being provided with at least one transverse slot (5,105) arranged between said upper section (9,105a) and said lower section (12,105b), characterized in that it comprises a connecting rod (6,106) between said upper section (9,105a) and said lower section (12,105b) and means (14,114) for the adjustment of the useful length of said rod to vary the maximum span of said at least one slot (5,105).

2. Ski boot, according to claim 1, characterized in that a first end (7) of said rod (6) is pivoted to a first connecting element (9) along a substantially horizontal axis, said first connecting element (9) being rigidly associated with said upper section and protruding out of said front quarter (2), a second end (11) of said rod (6) being slideably associated with a second connecting element consisting of a small block (12) rigidly associated with said shell (3) at said lower portion, said second end (11) of said rod (6) being furthermore provided with a threading for engagement to a ring (14), said small block (12) engaging said rod (6) in an intermediate position between said first end (7) and said ring (14).

3. Ski boot, according to claim 2, characterized in that said first end (7) of said rod (6) is pivoted inside said first connecting element (9) by means of a pivot (8), said rod (6) protruding from said first connecting element (9) through a slot (17) which is substantially perpendicular to the plane of arrangement of said at least one slot (5).

4. Ski boot, according to one or more of the preceding claims, characterized in that said second end (11) of said rod (6) is slideably associated with small block (12) by means of a seat (13) provided in said small block (12) and having an inner diameter which is considerably greater than the outer diameter of said rod (6) to allow an inclination of said rod (6) with respect to said block (12).

5. Ski boot, according to claim 1, characterized in that said flexing portion (104) is provided with a slot (105), said slot (105) defining an upper surface (105a) and a lower surface (105b) which respectively correspond to said upper section and said lower section, said rod (106) having a first end connected to a first connecting element (117) provided on said upper surface (105a) and a second end which is threaded and engageable with a ring (114), said ring (114) being accommodated in a

second connecting element (112) provided at said lower surface (105b), said first end being slideable in said first connecting element (117), said ring (114) being controllably rotatable.

6. Ski boot, according to claim 5, characterized in that said first connecting element consists of a hole (117) provided on said upper surface (105a) of said slot (105), said first end of said rod (106) being inserted in said hole (117) and being provided with an abutment (107) which is engageable with the inner edge of said hole.

7. Ski boot, according to claim 6, characterized in that said hole (117) has a diameter which is considerably greater than the outer diameter of said rod (106) and smaller than the outer diameter of said abutment (107), to allow an inclination of said rod (106) with respect to said upper surface (105a).

8. Ski boot, according to claim 2 or 5, characterized in that said first (9,117) and second (12,112) connecting elements are provided directly by molding of said front quarter (2,102) and of said shell (3,103)

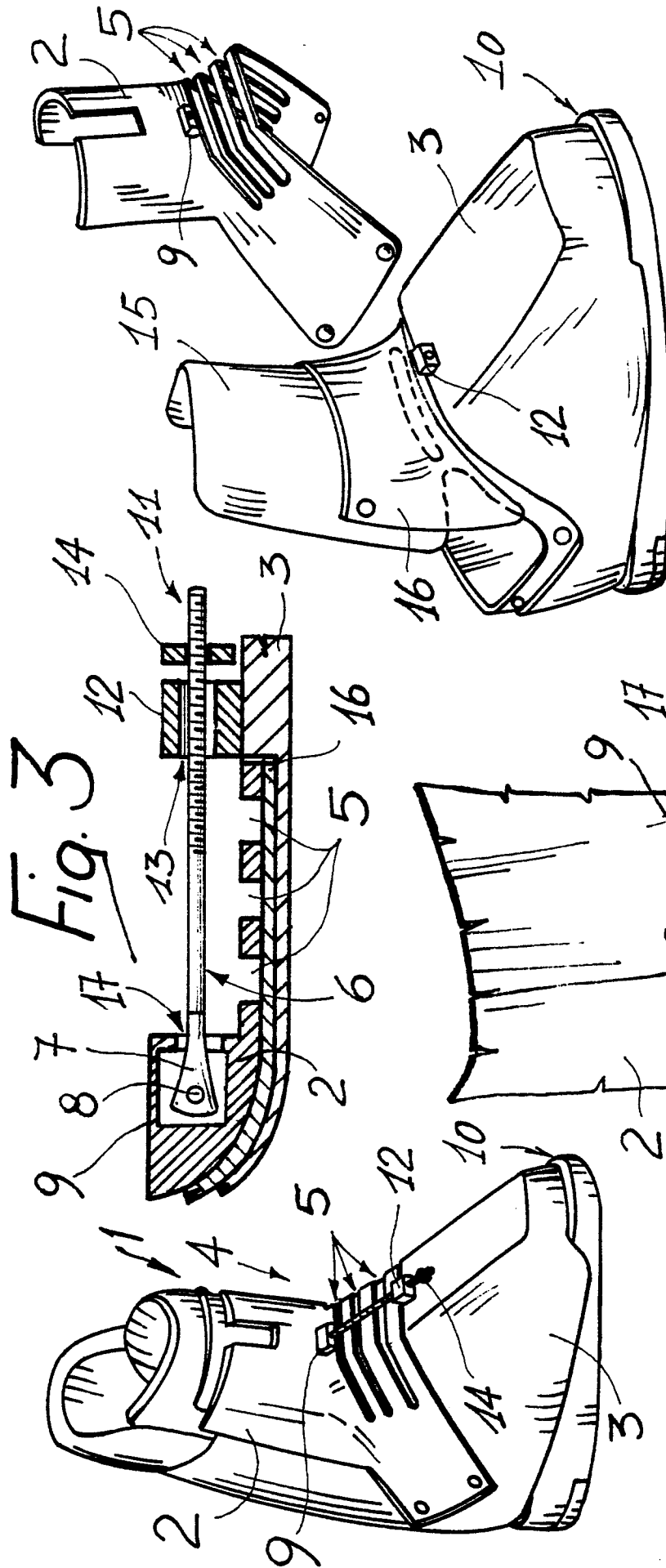


Fig. 1

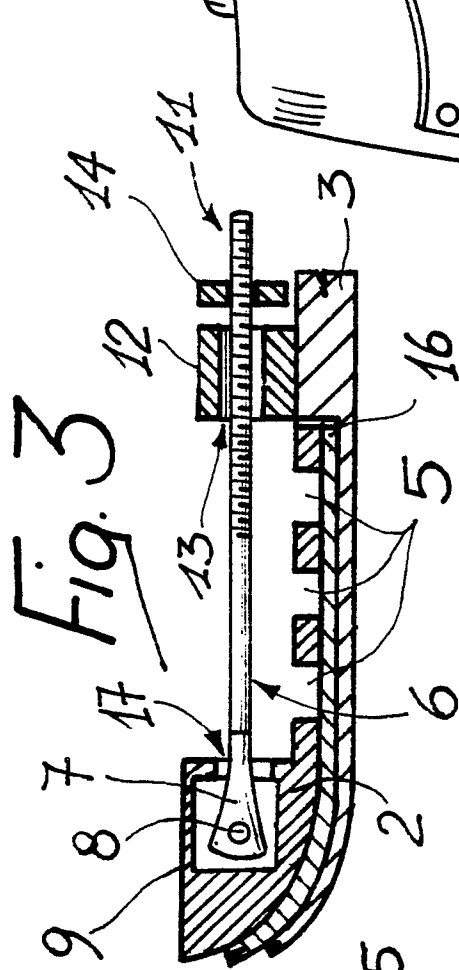


Fig. 2

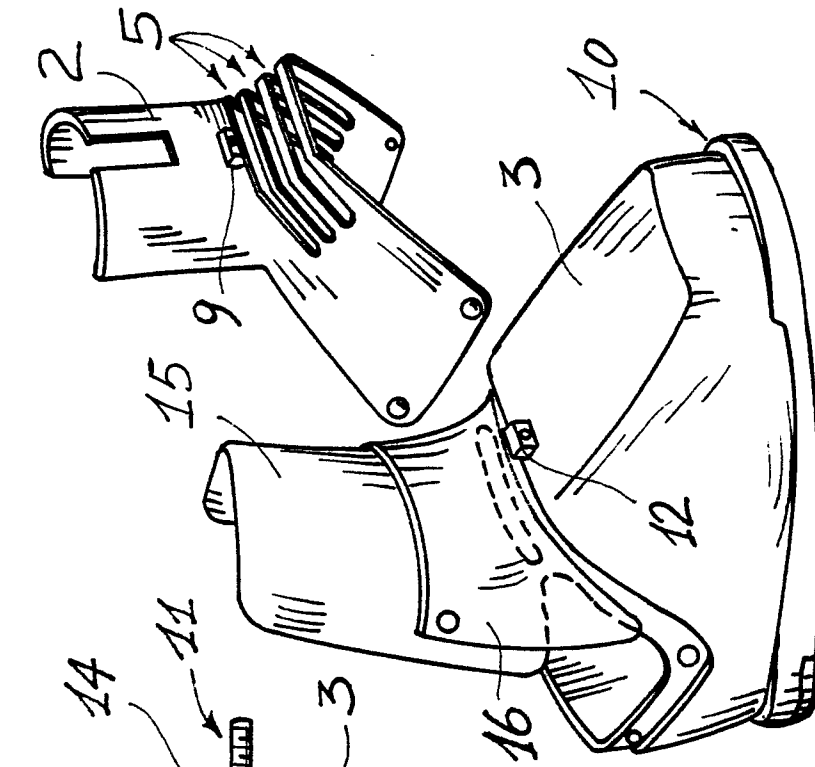


Fig. 3

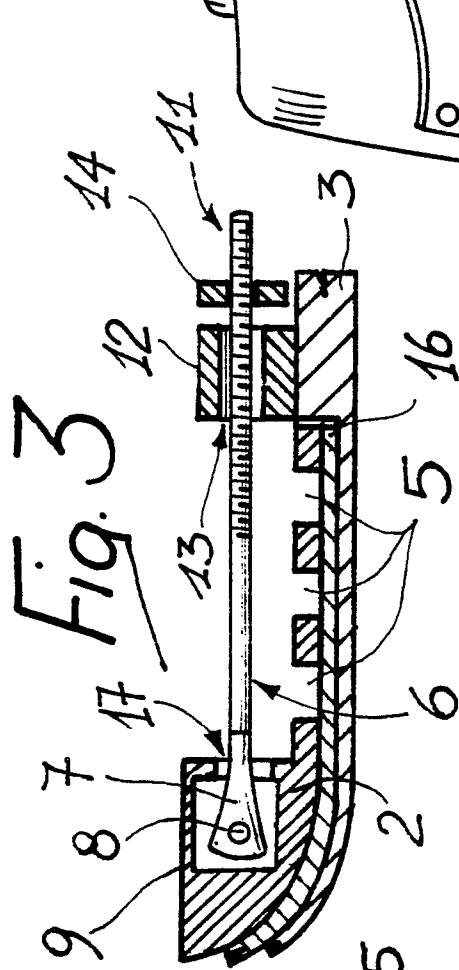


Fig. 4

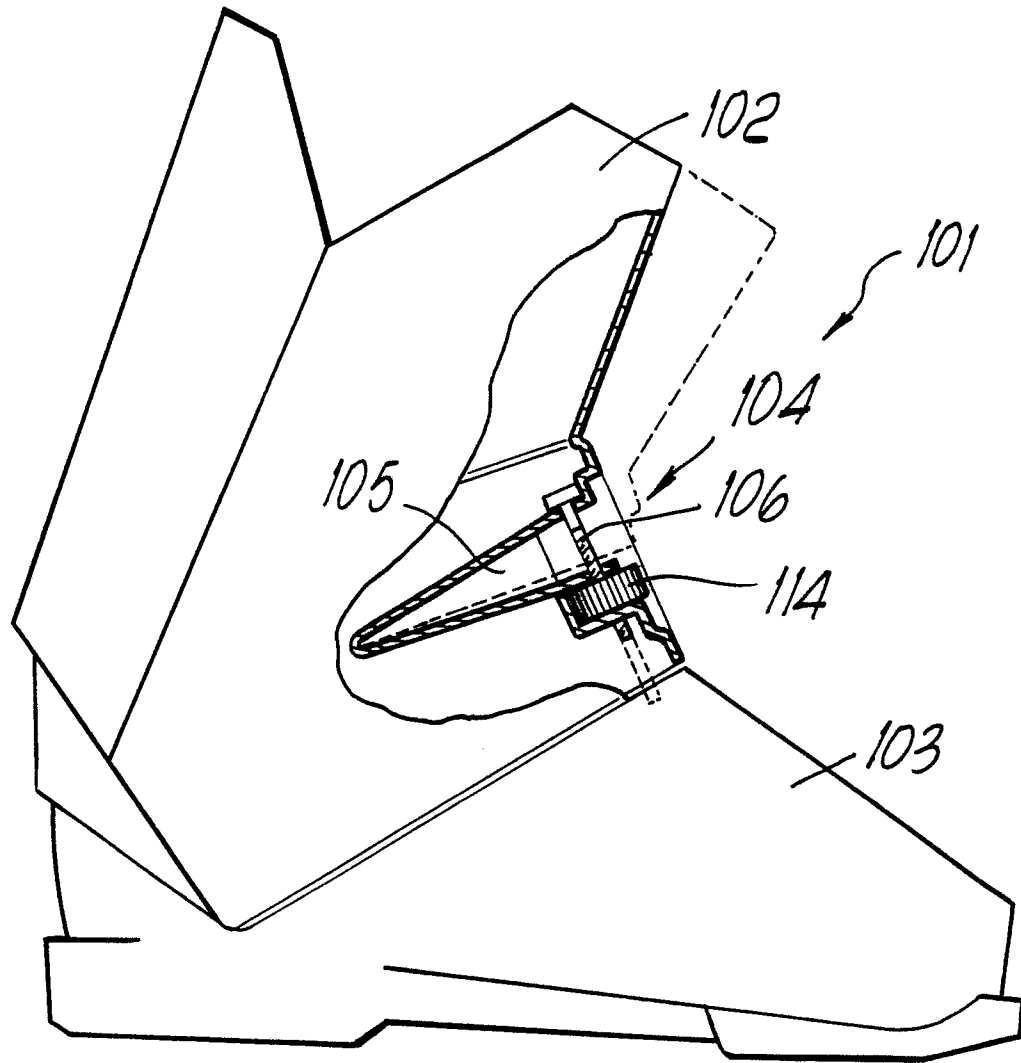


Fig. 5

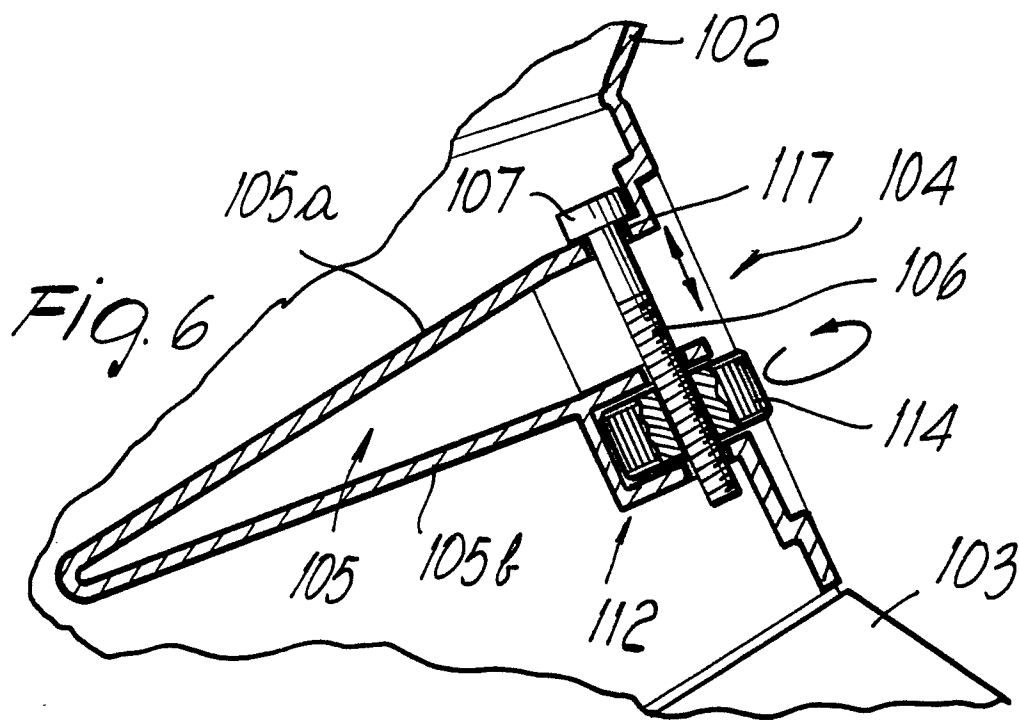


Fig. 6