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(54) Ski boot with flexibility adjustment device.

(57) The ski boot with a flexibility adjustment device comprises a shell (2) whereto is connected at least one quarter (3) which can be inclined or moved with respect to the shell (2). The device comprises a first stroke limiting element (5) to limit the forward movement of the quarter (3) and a second stroke limiting element (15) to limit the backward movement of the quarter (3). An adjustment member (12) can be operated externally by the user to vary the position of the first stroke limiting element (5) and thus vary the excursion of the quarter (3).

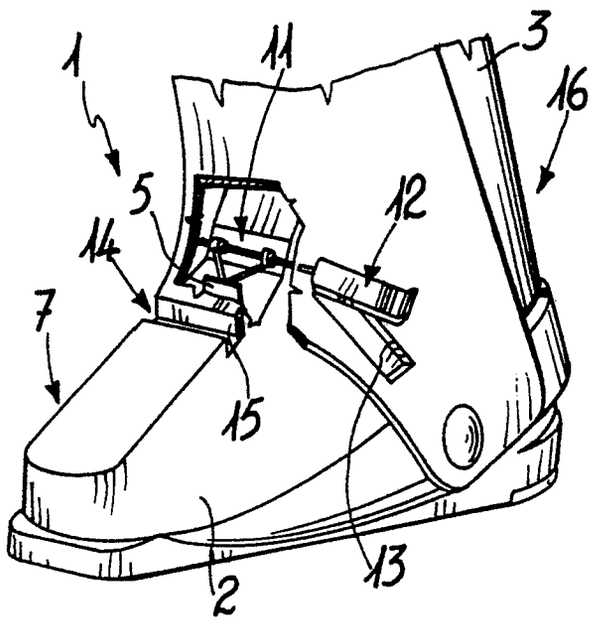

Fig. 1

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SKI BOOT WITH FLEXIBILITY ADJUSTMENT DEVICE

The present invention relates to a ski boot with a flexibility adjustment device.

As is known, when skiing, and in particular in the compression and extension phases, the leg imparts stresses to the boot, bending both forwards, toward the tip, and backwards, towards the heel.

The problem is thus currently felt of providing a ski boot wherein the forward flexibility is adjustable: for this purpose, a French patent application, No. 8400243, submitted on January 5, 1984, is known, wherein the presence of a shock-absorbing device, interposed between the shell and the front quarter, is provided.

This device comprises a pair of springs which can be preloaded by the user.

The main disadvantage of this known type of device resides in the fact that it is complicated from a constructive point of view and is therefore onerous as to its application to the boot.

Moreover, the flexibility of the front quarter with respect to the shell is completely due to the presence of the springs, which constantly oppose a mutual leg/shell movement: this implies that the leg of the user is constantly under strain, whatever the extent of the flexing performed.

Furthermore, the use of such a device, since it requires a considerable accommodation within the boot, adversely affects its aesthetical characteristics, increasing, at the same time, the overall weight thereof.

The aim of the present invention is therefore to eliminate the disadvantages described above in known types, by providing a ski boot with a device which allows the optimum adjustment of the degree of flexibility of the front quarter with respect to the shell.

Within the scope of this aim, an important object of the present invention is to provide a ski boot with a device which associates with the preceding characteristic that of having a simple and functional adjustment.

Another important object is to achieve a ski boot with a device which is also structurally simple, has a modest cost, and is easy and rapid to assemble to the boot.

Not least object is to devise a ski boot with a device which, besides allowing the adjustment of the degree of forward flexibility of the quarter, also allows its seal in case of flexing of the legs towards the heel region.

The aim and the objects described above, as well as others which will become apparent hereinafter, are achieved by a ski boot with a flexibility adjustment device, comprising a shell whereto is connected at least one quarter and characterized in that it comprises: a first stroke limiting element, adapted to limit the forward movement of said quarter, a second stroke limiting element adapted to limit the backward movement of said quarter, and an externally accessible adjustment means, adapted for varying the position of said first stroke limiting element to adjust the excursion of said quarter.

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

Figure 1 is a partially cross sectioned, perspective view of a ski boot with a flexibility adjustment device;

Figure 2 is a detail view, in partial cross section, of the boot of figure 1;

Figure 3 is a view along a longitudinal middle cross section plane of the boot of figure 1;

Figure 4 is a view, similar to the previous one, illustrating the device according to another aspect of the invention;

Figure 5 is a perspective view of a ski boot having an upper quarter associated with the front quarter and provided with the device according to the invention;

Figure 6 is a partially cut-away perspective view of the device applied to the boot of figure 5; and

Figure 7 is a view along a longitudinal middle cross section plane of the boot of figure 6.

With reference to figures 1-4, the reference numeral 1 generally indicates a ski boot consisting of a shell 2 whereto a front quarter 3 is hinged in a per se known manner.

A first transverse seat 4 is provided on the shell 2, preferably at the foot instep region, said seat accommodating a first element for limiting the stroke of the front quarter 3 with respect to the shell 2, consisting of an abutment 5.

The abutment 5 is provided with one side facing the surface 6 of said first seat 4 adjacent to the region of the tip 7 of the boot 1.

The ends of a pair of small connecting rods 8 are mutually articulated and connected to the opposite side of the abutment 5, and are articulated, at their other ends, to a pair of sliders 9 and 10 both whereof interact with a bar 11 having two regions, indicated by the numerals 11a and 11b, with counterposed thread.

Said connecting rods, said sliders and said bar constitute the means for the operation and the positioning of said first element for limiting the stroke of said front quarter 3 with respect to shell 2.

The bar 11 is rotatably associated with the front quarter 3 at the region above the one where said first seat 4 is provided, an end of said bar projecting out of said quarter and being articulated to a small grip and operation lever 12 which can be positioned, when not in use, in a recess 13 provided on the outer lateral surface of said front quarter.

Each of the sliders 9 and 10 is prevented from rotating, so that by rotating the bar 11 they are made to move in opposite directions.

In this manner the user can move the abutment 5 closer to, or further apart from, the surface 6; the free flexing stroke of the front quarter 3 with respect to the shell 2 is thus presettable, this stroke in other words being equal to the interspace between said surface 6 and said abutment 5.

Parallel to said first transverse seat 4, a second transverse seat 14 is provided on the shell 2, and the front terminal end 15 of the quarter 3 is accommodated therein, said end being shaped like a tooth, interacting by abutment, upon a movement of the front quarter towards the rear region 16 thereof, with the surface 17 of said second transverse seat 14 adjacent to the surface 6.

The length, in the direction of the longitudinal extension of the boot, of the second transverse seat 14 is such as to allow, by inclining the front quarter 3 forwards, the free sliding of the end 15 therein.

Said end 15 thus constitutes an element which limits the rearward stroke of the front quarter with respect to the shell.

Figure 4 illustrates another aspect of the invention, wherein at the surface 106 of the first transverse seat 104 provided on the shell 102 a shock-absorbing element is provided for the abutment 105 and consists of a small plate 118 in elastically deformable material.

The presence of said plate allows to dampen the impact of the abutment 105, thereby improving the skier's comfort.

Figures 5-7 illustrate the device, according to another aspect of the invention, applied to a boot 201 consisting of a shell 202 whereto are associated a front quarter 203 and a rear quarter 204 and also has an upper quarter, or "spoiler". 200 partially accommodated within the front quarter 203, at a recessed region provided in the front part of said front quarter 203.

The upper quarter 200 is provided with two lateral flaps 200a and 200b, each whereof has a lateral slot 207 within which a lateral stud 218, fixed on each of the two sides of the front quarter 203, is slideable. In the front region, the upper quarter 200 is furthermore provided with a tab 206 having a front slot 219 within which a front stud 213, fixed to the shell 202, is slideable. The slots 207 and 219 provide, together with the corresponding studs 218 and 213, the connection between the upper quarter and the boot, allowing simultaneously the translatory longitudinal motion of the upper quarter with respect to the front quarter and to the shell when the skier inclines his leg forwards.

Furthermore, the upper quarter 200 can be connected to the rear quarter 204, so as to achieve an elastic return of the upper quarter to its normal position when it is no longer acted upon by the skier's leg. The upper quarter 200 can be connected to the rear quarter 204, for example by means of a cable 214, as schematically illustrated in figure 6; furthermore, the cable 214 can be advantageously provided with a known means for the uncoupling and the adjustment of the tension, indicated at 214a, to allow the uncoupling of the rear quarter to put the boot on. In the foot instep region, the front quarter 203 is provided with a seat 215 which is upwardly closed and is open on the side facing the tab 206 so that said tab can slide inside it for a certain portion. An abutment 205 is accommodated inside the seat 215, and is connected by means of two small connecting rods 208 to the sliders 210 and 209 associated with a bar 211, having counterposed threads and rotatably associated with the front quarter 203. In a manner fully similar to what has been described above, by rotating the bar 211 the position of the abutment 205 is longitudinally adjusted.

For this operation, a lever 212, positioned outside the quarter as described above, is connected to the bar 211.

The abutment 205 acts as an abutment element for a raised edge 216 provided at the front end of the tab 206 of the upper quarter 200, so that the maximum forward stroke of the upper quarter 200, with respect to the front quarter 203, is determined by the position of the abutment 205 which is adjustable by acting on the lever 212.

The maximum rearward movement of the upper quarter is determined by the dimensions of the slot 219 within which the stud 213 is slideable, as illustrated in figure 7. In figure 7 the stud 213 is illustrated in the position wherein it abuts with the front edge of the slot 213, to the right in the figure, that is to say in the maximum possible rearward position of the upper quarter 200.

In order to avoid infiltrations of water or dirt inside the seat 215 and, most of all, inside the shell, a gasket 217, flexible and preferably made of rubber, is provided and is fixed to the upper quarter 200 at the tab 206 so that it covers the slot 219 and the open side of the seat 215.

It has thus been observed that the invention achieves the aim and the objects intended, a device having been provided which allows the optimum adjustment of the degree of flexibility of the front quarter with respect to the shell, or of the upper quarter with respect to the front quarter, by adjusting the position of a stroke-limiting abutment for the mutual movement of said quarter with respect to said shell.

The device is also structurally very simple, and can be easily assembled to the boot, its operation being at the same time simple and rapid.

The adjustment allowed can thus be furthermore differentiated according to the actual specific requirements of the skier, for example so as to subject the leg to a not excessive strain, also depending on the technical skill of the skier.

Naturally, the materials constituting the individual components of the boot, as well as their dimensions, may be any according to the specific requirements.

Claims

1. Ski boot with a flexibility adjustment device, comprising a shell whereto is connected at least one quarter and characterized in that it comprises: a first stroke limiting element, adapted to limit the forward movement of said quarter, a second stroke limiting element adapted to limit the backward movement of said quarter, an externally accessible adjustment means, adapted for varying the position of said first stroke limiting element to adjust the excursion of said quarter.

2. Ski boot, according to claim 1, characterized in that it comprises a front quarter hinged to said shell, said shell being provided with a first transverse seat arranged at the foot instep region and having at least one surface perpendicular to the longitudinal axis of said boot, said first stroke limiting element being associated with said front quarter and accommodated in said first seat and consisting of an abutment having a first face directed towards said surface of said first seat and a second face connected to said adjustment means to allow a variation of the useful distance between said first face of said abutment and said surface of said first seat.

3. Ski boot, according to claim 2, characterized in that said shell is provided with a second transverse seat arranged at the foot instep region and in front of said first transverse seat, said second transverse seat having at least one surface perpendicular to the longitudinal axis of said boot and cooperating with an abutment element provided on the front end of said front quarter to limit the rearward movement of said front quarter.

4. Ski boot, according to claim 3, characterized in that said abutment element consists of a tooth downwardly protruding from the front end of said front quarter, said tooth being accommodated and movable in said second transverse seat, said second seat having such dimensions as to allow the movement of said front quarter with respect to said shell in the direction of the longitudinal axis of said boot.

5. Ski boot, according to claim 1, characterized in that it comprises a front quarter and a rear quarter associated with said shell, said boot furthermore comprising an upper quarter which is movable with respect to said front quarter and is at least partially accommodated at a recessed region of the upper front edge of said front quarter, said front quarter being provided, in front of said upper front edge, with a longitudinal seat accommodating said first stroke limiting element, said first stroke limiting element being fixed to said front quarter and consisting of an abutment having a first face directed towards an abutment surface of said upper quarter and a second face connected to said adjustment means to allow the adjustment of the useful distance between said first face and said abutment surface of said upper quarter to vary the maximum possible forward movement of said upper quarter with respect to said front quarter.

6. Ski boot, according to claim 5, characterized in that said upper quarter is provided with a front tab arranged at said longitudinal seat of said front quarter, said tab being slideable within said longitudinal seat, said tab having a front end which defines said abutment surface.

7. Ski boot, according to claim 6, characterized in that said tab is provided with a slot which is substantially parallel to the longitudinal axis of said boot and is adapted to slideably accommodate a central stud fixed to said shell, the front edge of said slot interacting with said stud to limit the maximum possible rearward movement of said upper quarter with respect to said shell.

8. Ski boot, according to claim 1, characterized in that said adjustment means comprises a pair of small connecting rods which are mutually articulated and are connected at one of their ends to an abutment which constitutes said first stroke limiting element, each of said connecting rods being furthermore connected, at the end opposite to the one connected to said abutment, to a threaded slider coupled to a bar with counterposed threads, said sliders being prevented from rotating so that a

rotation of said bar is matched by a translatory movement, in opposite directions, of said sliders along said bar.

9. Ski boot, according to claim 8, characterized in that it comprises a front quarter, said bar being rotatively associated with, and arranged inside, said front quarter, said bar being furthermore provided with an end protruding out of said front quarter and hinged to a grip lever, said grip lever being accommodated, when not in use, in an adapted seat provided on the outer surface of said front quarter.

10. Ski boot, according to claims 2 or 5, characterized in that said abutment is provided, on said first face, with a shock-absorbing element consisting of a small plate of elastically deformable material.

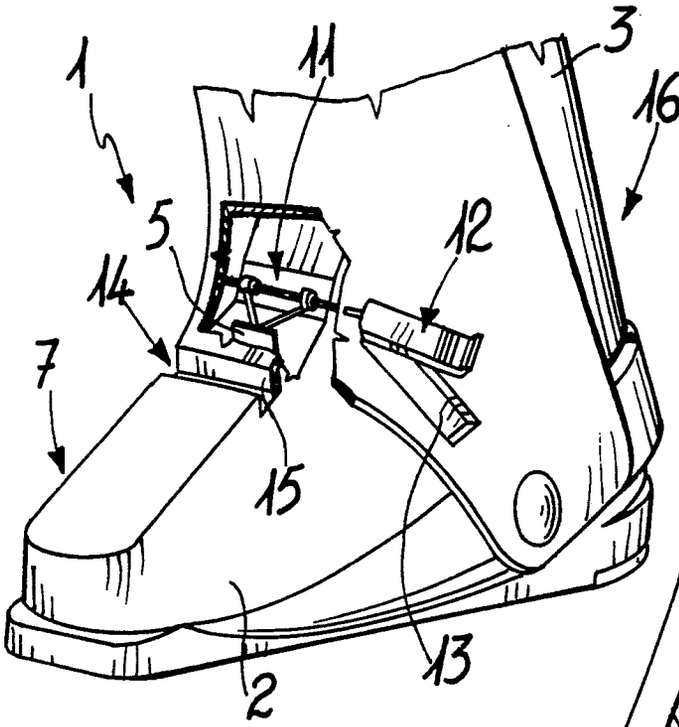

Fig. 1

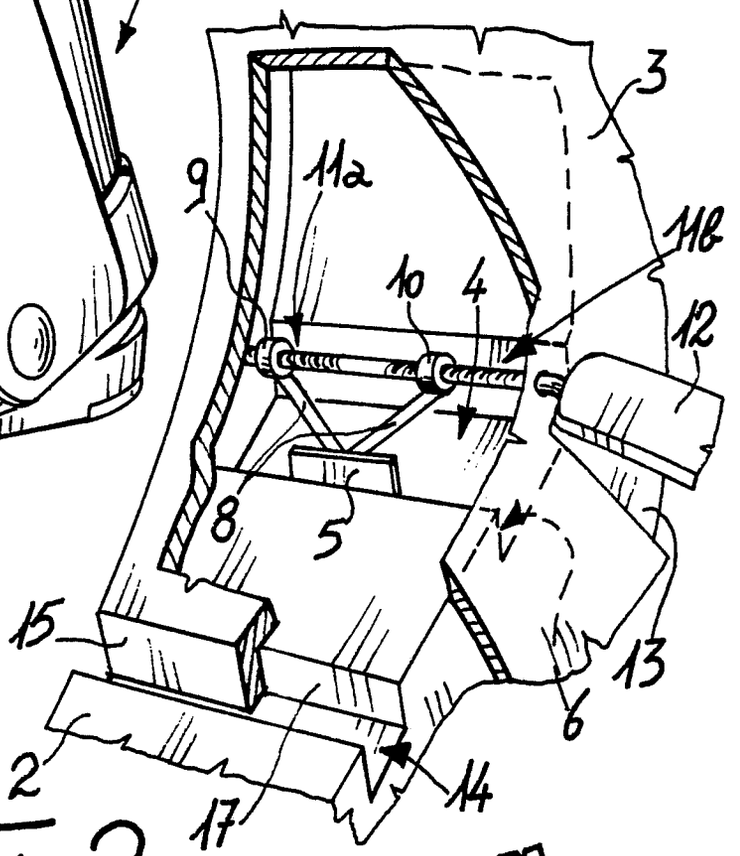

Fig. 2

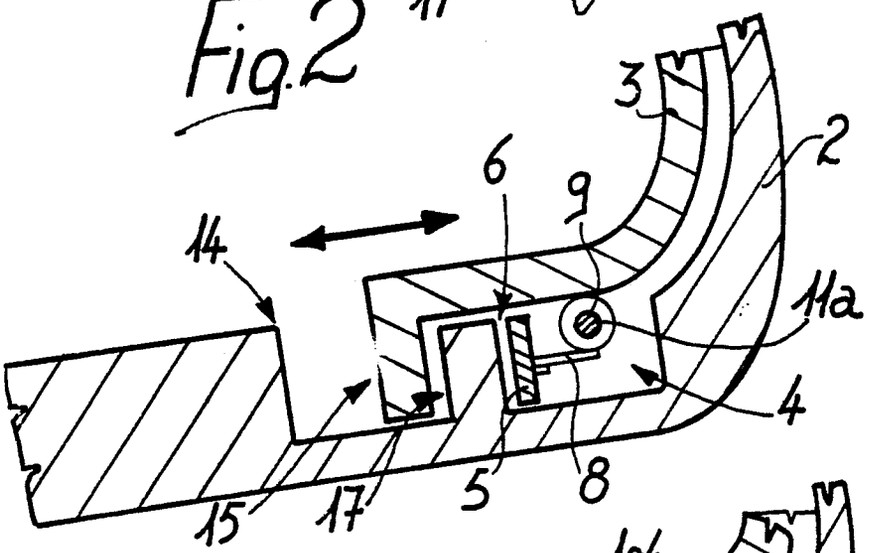

Fig. 3

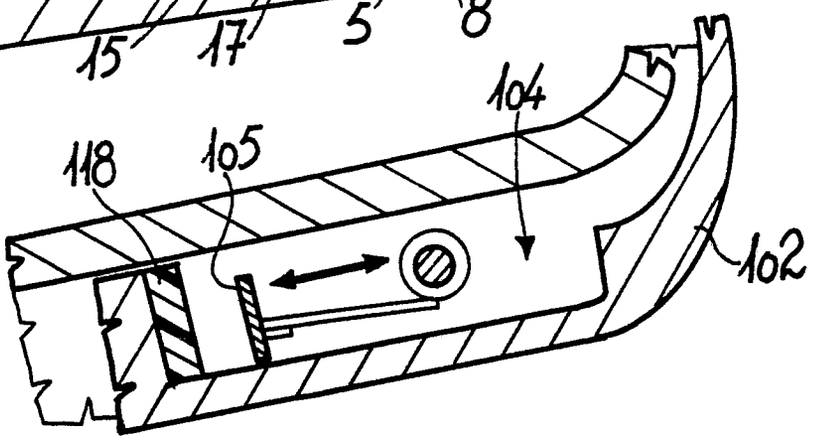

Fig. 4

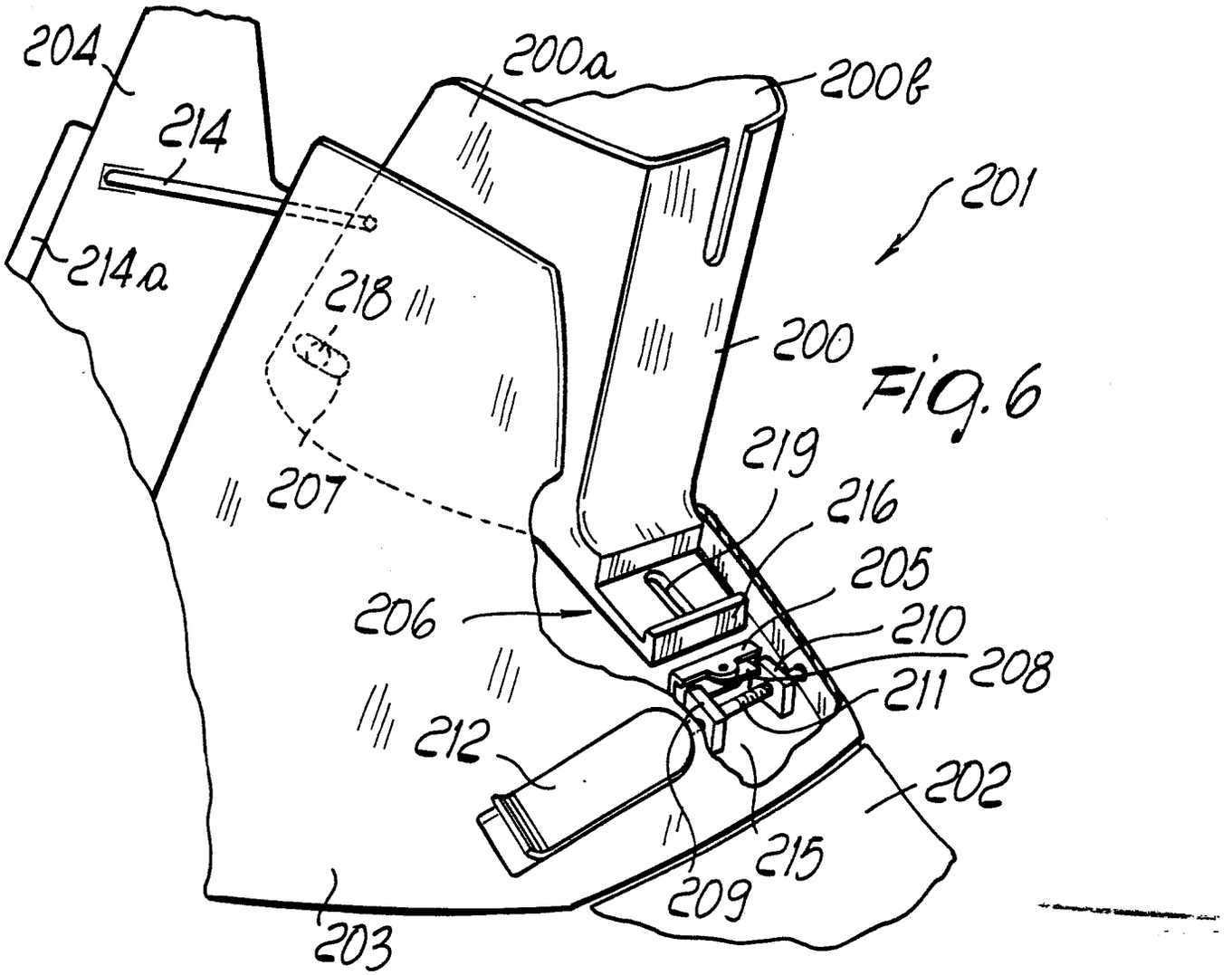

FIG. 6

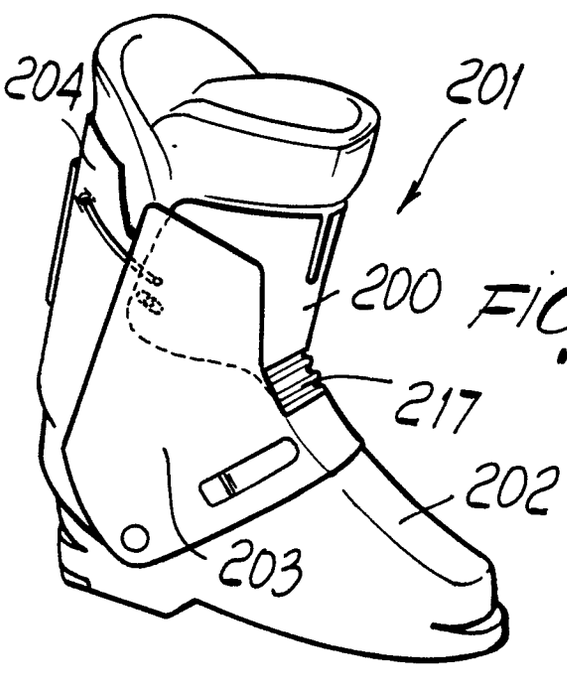

FIG. 5

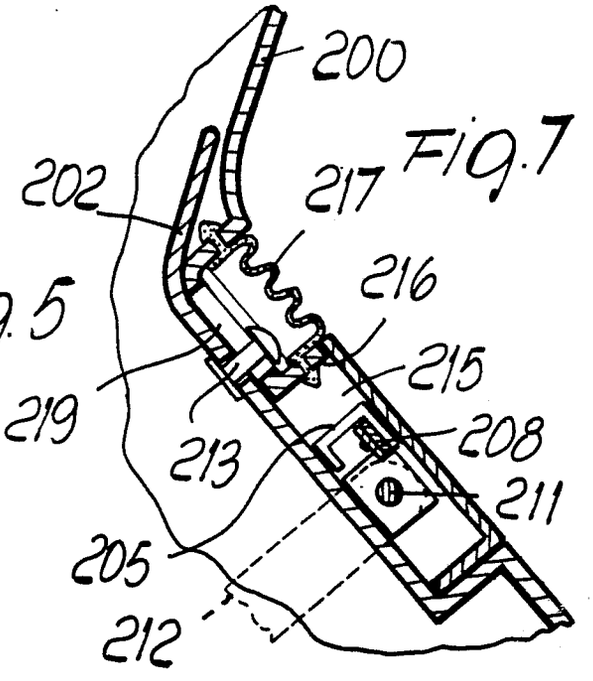

FIG. 7