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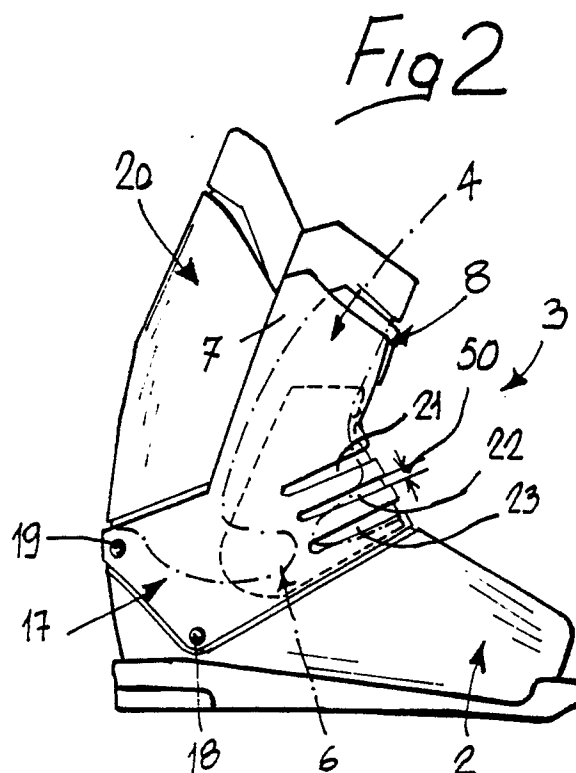
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(54) **Ski boot.**

(57) The rear entry ski boot comprises a shell (2), a rear quarter (20) pivotally connected to the shell (2), and a front quarter (7). The ski boot further comprises a band-like element (17), rigidly associated with the shell (2) and interconnected to the front quarter (7). A plurality of slots (21, 22, 23) is formed in the band-like element (17) at the foot instep region (3). An elastically deformable flap and a gasket are located beneath the band-like element, the flap being engageable in snap-together engagement with the front quarter (7).



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SKI BOOT

The present invention relates to a ski boot.

Currently, in known rear-entry ski boots, both in the case of conventional boots consisting of a shell, a front quarter and a rear quarter, and in the case of monolithic ski boots, wherein the shell and the front quarter are provided monolithically, the problem arises of allowing the forward flexing of the front quarter.

In the Applicants prior published Italian Utility Model Application N. 21815 B/81, dated 19th May 1981, a structure of a ski boot is described, comprising a shell and a front quarter, provided monolithically, having a transverse slot on said front quarter at the region of the foot instep.

The forward flexing of the quarter is thus allowed, reducing the span of said slot, a closure element being advantageously associated therewith, fixed at one end of the shell so as to prevent any infiltrations of water or snow.

The solution proposed, though allowing the forward flexing of the quarter, does not allow to graduate such flexing.

French patent application no. 8008948 is also known, wherein a rear-entry ski boot is described which is provided, on the front quarter and at the region of the foot instep, with a groove arranged transverse with respect to the quarter.

The flexibility of the front quarter is allowed since the same can move forwards until it closes the span of said groove and thus causes the abutment of the two facing edges thereof.

In order to adjust this flexibility, a small rigid block, slideable in said groove, is provided therein, said block being lockable in the desired point interposed between the end and the middle portion of said groove.

The disadvantage found in such known types of ski boots resides in the fact that the degree of flexibility has a constant and not gradual value during flexing.

Moreover, it has been observed that the operation of such small blocks on the part of the user is not easy, being troublesome if snow or ice enters the groove.

There is also known another French patent application no. 8309449, wherein a ski boot is described, provided with a front quarter pivotably coupled to the shell: the free end of said front quarter, arranged at the region of the foot instep, is equally spaced from a raised portion provided at the shell.

The quarter can thus perform a forward motion until its end makes contact with said raised portion.

Parallel to the raised portion, on said front quarter, there is a slot proximate to said end.

In order to vary the flexibility of the quarter, sliders are associable, at said slot and at the interspace between the end of said quarter and said raised portion provided on the shell, said sliders being variably positionable therein.

The disadvantages occurring in such a known type of ski boot essentially reside in the fact that the degree of flexibility has a constant value during flexing and in that the quarter must in any case perform a rotation with respect to the point whereat it is pivotally connected to the shell.

The main aim of the present invention is therefore to eliminate all of the disadvantages of the prior art, in particular those described above, by devising a ski boot which allows to obtain a gradual forward flexibility of the quarter, without the latter necessarily rotating with respect to the shell, such flexibility being achieved progressively according to the stress imparted by the skier.

Within the scope of the above described aim, an important object of the invention is to devise a ski boot wherein the flexibility of the front quarter thereof is a function of easily controllable parameters.

Another object of the invention is to provide a ski boot wherein it is easy to preset and therefore to vary the characteristics of flexibility of the front quarter.

A further object of the invention is to devise a ski boot structurally simple and economical.

Still another object of the invention is to provide a ski boot obtainable in a simple manner from a constructive point of view.

Not least object of the invention is to devise a ski boot which allows to accommodate, at the malleolar region of the front quarter, any required adjustment or locking devices.

The aim and the objects described above, as well as others which will become apparent hereinafter, are achieved by a rear entry ski boot comprising a shell, a rear quarter and a front quarter, said rear quarter being pivotally connected to said shell, characterized in that it comprises at least one band-like element and a plurality of slots, said band-like element being rigidly associated with said shell and interconnected to said front quarter, said plurality of slots being formed in said band-like element.

Advantageously, the ski boot comprises a sealing element against infiltrations of water at said slots.

Advantageously, with said slots are associable means for further graduating the flexibility of the front quarter.

Further characteristics and advantages of the invention will become apparent from the detailed description of a particular, but not exclusive, embodiment, illustrated only by way of non-limitative example in the accompanying drawing tables, where:

fig. 1 is a perspective view of the ski boot according to the invention;

fig. 2 is a lateral view thereof;

fig. 3 is an exploded view of said ski boot, in which, for the sake of clarity, the rear quarter has been omitted;

figs. 4, 5, 6, 7 and 8 illustrate some embodiments of the front quarter;

fig. 9 is an explanatory graph of the relationship between the force imparted to the quarter and the measure of the span of the individual slots;

figs. 10, 11 and 12 are views of the configuration assumed by three different embodiments of the front quarter as a consequence of an identical force imparted thereto;

figs. 13 and 14 are views of the operation of means adapted for further graduating the flexibility of the quarter;

fig. 15 is another embodiment of the front quarter;

fig. 16 is a monolithic ski boot wherein the shell and the front quarter are provided enbloc.

With reference to the above-described figures, the reference numeral 1 indicates a rear-entry ski boot which comprises a shell 2 provided with a flap 4 projecting from the foot instep region 3, above the shell 2 and embracing the tibial region 5 of the foot.

Said flap 4 is elastically deformable, it being provided, preferably but not necessarily, with a transverse opening 6 at the foot instep region 3, the flexing of the foot instep occurring in said region during use of the boot 1.

The opening 6 has a configuration adapted to impart a desired degree of elasticity to said flap.

Advantageously, at the longitudinal mid-plane of the ski boot 1, on the flap 4, an element for connecting to a front quarter 7 may be provided, consisting of a lug 8 projecting from said flap at the surface facing towards the tip of the boot.

Said lug 8 essentially consists of a parallelepipedal shaped member having, at the end facing the foot instep region 3, a small tooth 9 adapted to engage in snap-together engagement relationship the end 10 of a longitudinal notch 11 provided on said front quarter 7.

With said flap 4 is expediently associated a sealing element for preventing the ingress of water, consisting of a sealing element or gasket 12 encircling said flap and said shell at the foot instep region 3 and partially at the tibial region 5.

Preferably, said gasket 12 is associated at one end 14a with said flap 4 by means of suitable studs 13, the other end thereof 14b, preferably being unattached and resting on said shell 2 proximate to a raised portion 15, adapted for the support and abutment of the perimetral edge or border 16 of a band-like element 17, adapted for interconnecting the front quarter 7 and the shell 2.

The band-like element 17 is matchingly shaped with respect to the region 3 of the foot instep, while the front quarter 7 is matchingly shaped with respect to the region 5 of the tibia.

The band-like element 17 has two lateral wings 17a, 17b associated, at their free end, with said shell 2 by means of a first stud 18 and a second stud 19.

The first stud 18 allows to fix the front portion of the band-like element 17 to the shell 2, the second stud simultaneously allows to fix the rear portion of the band-like element 17 to the shell 2 and acts as a hinge point between the shell 2 and the rear quarter 20, the latter being thus able to rotate to allow the opening of the boot.

At the foot instep region 3, the band-like element 17 is provided with a plurality of slots, in the particular embodiment three slots are illustrated: thus, there is a first slot 21, a second slot 22 and a third slot 23, identical and arranged parallel to one another and to the raised portion 15 of the shell 2, their lateral ends partially affecting said lateral wings 17a, 17b of the band-like element 17.

Each of the slots 21, 22 and 23 is a substantially parallel slot having a span 50 of constant dimensions.

In flexing, the skier imparts a force to the front quarter 7 which makes it flex forwards: this flexing occurs and is allowed by virtue of the presence of the band-like element 17, and the slots 21, 22 and 23 formed therein.

Sequentially, the stress imparted to the quarter 7 is transmitted to the band-like element 17 and initially causes the span of the first slot 21 to diminish until the abutment of the facing edges thereof occurs; subsequently the span of the second slot 22 is reduced and closed, and once the span thereof has been closed the span of the third slot 23 is reduced and closed.

In this manner, gradual flexibility is achieved, due to the deformability of the material and to the dimensions of the slots, to the number thereof and to their arrangement on the band-like element 7.

For a correct operation in flexing, preferably the foot instep region 3 whereat said slots 21, 22, 23 are provided on said band-like element 17 is planar or advantageously slightly convex with the concavity directed towards the exterior, i.e. in a direction extending away from said first stud 18 and said second stud 19.

Such an arrangement ensures correct operation of the band-like element 17, by preventing the portions thereof delimiting the slots 21, 22, 23 from overlapping, obtaining undesirable and uncontrollable effects in flexing.

The presence of the gasket 12 prevents any infiltration of water due to the presence of snow at the slots.

Fig. 10 illustrates the flexing condition if a force F1 is imparted to the front quarter 7 closing the spans of the first and second slots of the band-like element 17 according to the diagram of fig. 9 where the decrease of the span of each individual slot is plotted on the abscissa in sequence.

Means adapted to further graduate the flexibility of the band-like element 17 are associable with said slots 21, 22, 23, said means being composed of one or more blocks 24, essentially T-shaped, the stem 25 thereof has a width equal to the span of the slot, said block 24 also having a grip element 26, projecting therefrom to enable a skier to shift the block, to regulate the flexibility of the band-like element 17, as will be described hereinafter.

The fins 27 of the block 24 instead rest on the surfaces of the band-like element 17 adjacent to the slot and facing towards the interior of the boot, said fins 27 prevent the slippage of the block 24 out of the slot, and guide the block when moved along the slot.

If the skier does not wish to use said blocks 24 to vary the flexibility of the band-like element 17, at least one recessed seat 28, shaped complementarily with respect to the stem 25 of the block and therefore such as to allow its accommodation therein, may be provided at each slot.

Such a condition, illustrated in fig. 14, renders the block inoperative, and thus permits the skier to regulate the flexibility of the band-like element 17, by simply varying the position of the block 24 in the slot.

Naturally, the length of the fins 27 is such as to prevent the slippage of the block out of the slot even when the block is rendered inoperative.

It has thus been observed that the invention achieves the intended aim and objects, a ski boot having been provided which allows to achieve a gradual forward flexibility of the quarter which is progressive according to the stress imparted by the skier.

The ski boot is furthermore obtainable in a simple manner from the point of view of manufacture, this allowing to contain its cost.

Naturally, the invention is susceptible to numerous modifications and variations, all of which are within the scope of the same inventive concept.

For example, as illustrated in figures 1 to 3, the front quarter 7 and the band-like element 17 can be formed monolithically or rigidly associated with each other. Alternatively, the front quarter 107, which embraces the tibial region 5 of the leg can be rigidly associated with lateral extensions 107a (Fig. 5), pivotably associated with the second stud 119, while the band-like element 129, embracing the foot instep region, may be rigidly associated with the shell at the studs 118 and 119 as illustrated in fig. 15.

Thus, the band-like element 117 is rigidly associated with the shell, and the front quarter 107 is pivotally mounted to the band-like element.

Naturally, the slots 121, 122 and 123 are provided in the band-like element 129. The front quarter 107 can oscillate about the point, defined by the studs 119, whereat the lateral extensions 107a are pivotally connected to the band-like element 117. Free forward oscillatory movement of the front quarter 107 is delimited by abutment engagement of the front lower edge 107c of the front quarter with the rear upper edge 117c of the band-like element 117. Thereafter, any force or flexing of the front quarter 107 tends to close the slots 121, 122, 123 in the band-like element 117, which in turn acts on the shell.

By manufacturing the front quarter 107 in such a way that it is pivotally connected to the band-like element, the arrangement allows, for example, to preset the amount of flexibility of the boot by adopting the required band wherein, for example, the color features might suggest a given obtainable degree of flexibility to the skier.

If the ski boot is of the monolithic type, that is if the shell, the band-like element and the front quarter are all provided enbloc, the slots may be provided either directly on the front quarter or at the band-like element; a ski boot of this type is indicated by the numeral 130 in fig. 16. Fig. 4 illustrates a second embodiment of the invention wherein a first slot 221, a second slot 222 and a third slot 223 are provided on the band-like element 217, all said slots being arranged at the foot instep region approximately parallel to the raised portion provided on the shell.

The ends of the second slot 222 affecting the lateral wings 217a of the band-like element 217, are again approximately parallel to said raised portion, the ends of the first and third slots 221, 223 being instead arranged so as to converge with respect to the second slot 222.

With this solution, greater values of flexibility are achieved, illustrated in the graph of fig. 9, wherein the letter A indicates the curve related to the embodiment of figures 1 to 3, in the condition of fig. 10, and the letter B indicates the curve related to said second embodiment of fig. 4 in the condition of fig. 12.

Fig. 5 illustrates a third embodiment, wherein a first slot 321, a second slot 322 and a third slot 323 are provided on the band-like element 317, all said slots being arranged at the foot instep region, approximately parallel to the raised portions provided on the shell.

The ends of the second slot 322 affecting the lateral wings 317a of the band-like elements 317 are again arranged approximately parallel to said raised portion, the ends of the first and third slots 321, 323 being instead arranged so as to diverge with respect to the second slot 322.

Such an arrangement allows to achieve smaller values of flexibility, illustrated in the graph of fig. 9 wherein the letter C indicates the curve related to the embodiment of figure 5 in the condition of figure 11.

Fig. 6 illustrates a fourth embodiment, wherein a first slot 421, a second slot 422 and a third slot 423 are again provided on the band-like element 417.

All said slots, at the foot instep region, are approximately parallel to the raised portion provided on the shell, said slots being provided, at the ends affecting the flaps 417a of the band-like element 417, with a progressive decrease of the span.

The same are thus V-shaped in such regions.

Fig. 7 illustrates a fifth embodiment, illustrating a front quarter 507 and a band-like element 517 on which a first slot 521, a second slot 522 and a third slot 523 are provided.

Also in this embodiment, said slots, at the foot instep region, are approximately parallel to said raised portion provided on the shell, in this region the span being constant.

Instead, at the wings 517a of the band-like element 517, each of said first, second and third slots has a span which progressively increases in width towards the ends of the wings 517a.

As to said fourth and fifth embodiments, the graph of fig. 9 is respectively similar to the one indicated by the letter C (but with a value for the upper spans) and similar to the one indicated by the letter B, achieving, however, a better distribution of stresses.

Fig. 8 illustrates a sixth embodiment, wherein a first slot 621, a second slot 622 and a third slot 623 are provided on the band-like element 617, rigidly associated with the quarter 607, all said slots being approximately parallel to the raised portion provided on the shell, all having the same span, and

being differentiated in that the longitudinal extension of the slots at the lateral wings 617a of the band-like element are different from one another in length.

In particular, said length increases starting from said first slot up to said third slot.

This embodiment allows to achieve variations in the flexibility characteristics by varying the ideal arm of rotation in flexing.

All the above described embodiments thus allow to achieve a gradual flexibility of the front quarter, wherein the flexing excursion is equal to the sum of the spans of each individual slot.

Naturally, the number of slots may be any according to the specific requirements.

Claims

1. A rear entry ski boot (1) comprising a shell (2), a rear quarter (20), and a front quarter (7, 107, 207, 307, 407, 507, 607), said rear quarter (20) being pivotally connected to said shell (2), characterized in that it comprises at least one band-like element (17, 117, 217, 317, 417, 517, 617) and a plurality of slots (21, 22, 23, 121, 122, 123, 221, 222, 223, 321, 322, 323, 421, 422, 423, 521, 522, 523, 621, 622, 623), said band-like element (17, 117, 217, 317, 417, 517, 617) being rigidly associated with said shell (2) and interconnected to said front quarter (7, 107, 207, 307, 407, 507, 607), said plurality of slots (21, 22, 23, 121, 122, 123, 221, 222, 223, 321, 322, 323, 421, 422, 423, 521, 522, 523, 621, 622, 623) being formed in said band-like element (17, 117, 217, 317, 417, 517, 617).

2. Ski boot according to claim 1, characterized in that it comprises a shell (2) having, at the foot instep region (3), a raised portion (15) for support and abutment of the perimetral edge (16) of said band-like element (17, 117, 217, 317, 417, 517, 617) associable with said shell (2), said band-like element (17, 117, 217, 317, 417, 517, 617) being provided, at the foot instep region (3), with at least two slots (21, 22, 23, 121, 122, 123), identical and arranged parallel to one another and to said raised portion (15) provided on said shell (2).

3. Ski boot according to claim 1 or 2, characterized in that said band-like element (17, 117, 217, 317, 417, 517, 617) is shaped complementarily with respect to the foot instep regions (3) and is provided with at least two lateral wings (17a, 17b, 117a, 117b, 217a, 317a, 417a, 517a, 617a) associated, at their free end, with said shell (2) by means of at least one first stud (118) and at least one second stud (119), said first stud (118) and said second stud (119) being adapted to fix said band-like element (17, 117, 217, 317, 417, 517,

617) to said shell (2), said second stud (119) also acting as hinge point between said shell (2) and the rear quarter (20) of said ski boot (1).

4. Ski boot according to claim 1 or 2, characterized in that said band-like element (117) has rigidly associated therewith at least two lateral wings (117a, 117b) and in that said front quarter (107) has rigidly associated therewith, at least two lateral extensions (107a), said ski boot further comprising at least one first stud (118) and at least one second stud (119), said first stud (118) and said second stud (119) being adapted for fixing said lateral wings (117a, 117b) of said band-like element to said shell (2), said second stud (119) being further adapted for pivotally associating said lateral extensions (107a) of said front quarter (107) with said shell (2).

5. Ski boot according to one or more of the preceding claims, characterized in that said plurality of slots (21, 22, 23, 121, 122, 123, 221, 222, 223, 321, 322, 323, 421, 422, 423, 521, 522, 523, 621, 622, 623) consist of a first (21, 121, 221, 321, 421, 521, 621), a second (22, 122, 222, 322, 422, 522, 622) and a third (23, 123, 223, 323, 423, 523, 623) slot.

6. Ski boot according to one or more of the preceding claims, characterized in that each slot in said plurality of slots (21, 22, 23) defines a span (50) of identical and constant dimensions.

7. Ski boot according to claim 3 or 4, characterized in that said band-like element (17, 117, 217, 317, 417, 517, 617) is slightly convex with the concavity directed towards said first and second studs (118, 119).

8. Ski boot according to one or more of the preceding claims, characterized in that said shell (2) has at a foot instep region (3) thereof, a flap (4) projecting above said shell (2) and embracing the tibial region (5) of the foot, said flap (4) being elastically deformable and having formed therein at least one transverse opening (6) at said foot instep region (3).

9. Ski boot according to claims 1 and 8, characterized in that it comprises at least one sealing element, interposed between said flap (4) and an inner surface of said band-like element (17, 117, 217, 317, 417, 517, 617), said sealing element (12) embracing said flap (4) and said shell (2) at said foot instep region (3) and partially at said tibial region (5).

10. Ski boot according to claims 1 and 9, characterized in that said sealing element (12) is rigidly associated at one end with said flap (4) at the tibial region (5), the other end of the said gasket freely resting on said shell (2).

11. Ski boot according to one or more of the preceding claims, characterized in that at least one slot in said plurality of slots (21, 22, 23) is asso-

ciated with means (24) for graduating the flexibility of the band-like element (17), comprising at least one block (24), essentially T-shaped and having a stem (25) defining a width equal to the span (50) of the slot (21, 22, 23) and a grip element (26) protruding therefrom, said block (24) further comprising fins (27) arranged transversely to said slot (21, 22, 23) and defining a length greater than said span (50).

12. Ski boot according to claims 1 and 11, characterized in that said grip element (26) of said block (24) allows the selective positioning of said block (24) at a desired point of said slot (21, 22, 23), said slot (21, 22, 23) having at least one recessed seat (28) shaped complementarily with respect to said stem (25) of said block (24).

13. Ski boot according to one or more of the preceding claims, characterized in that it comprises a band-like element (217) on which are provided a first (221), a second (222) and a third (223) slot with constant span, which are positioned at the foot instep region (3) parallel to said raised portion (15) provided on said shell (2), the ends of said second slot (222) laterally affecting said band-like element (217) and being arranged approximately parallel to said raised portion (15), said first (221) and third (223) slots being arranged so as to converge with respect to said second slot (222).

14. Ski boot according to one or more of the preceding claims, characterized in that a first (321), a second (322) and a third slot (323) are provided on said band-like element (317) at the foot instep region (3), approximately parallel to the raised portion (15) provided on the shell (2), the ends of said first (321) and third (323) slots affecting said lateral wings (317a) of said band-like element (317), and being arranged so as to diverge with respect to said second slot (322).

15. Ski boot according to one or more of the preceding claims, characterized in that a first (421), a second (422) and a third (423) slot are provided on said band-like element (417), having, only at the foot instep region (3), a constant span and a path approximately parallel to that of the raised portion (15) provided on said shell (2), said first (421), second (422) and third (423) slots having, at the ends affecting said lateral wings (417a) of said band-like element (417), a progressive decrease of the span, thereby imparting to said slots (421, 422, 423) a V-like shape.

16. Ski boot according to claim 3, characterized in that a first (521), a second (522) and a third (523) slot are provided on said band-like element (517), having a constant span and a path, at the foot instep region (3), approximately parallel to that of said raised portion (15) provided on said shell (2), at the lateral wings (517a) of said band-like element (517) each of said first (521), second

(522) and third (523) slots defining a span, the width whereof progressively increases towards the end of the wings (517a).

17. Ski boot according to one or more of the preceding claims, characterized in that a first (621), a second (622) and a third (623) slot with constant span and parallel to said raised portion (15) provided on said shell (2) are provided on said band-like element (617), said first (621), second (622) and third (623) slots being provided, at said lateral wings (617a) of said band-like element (617), with a mutually different length.

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Fig 1

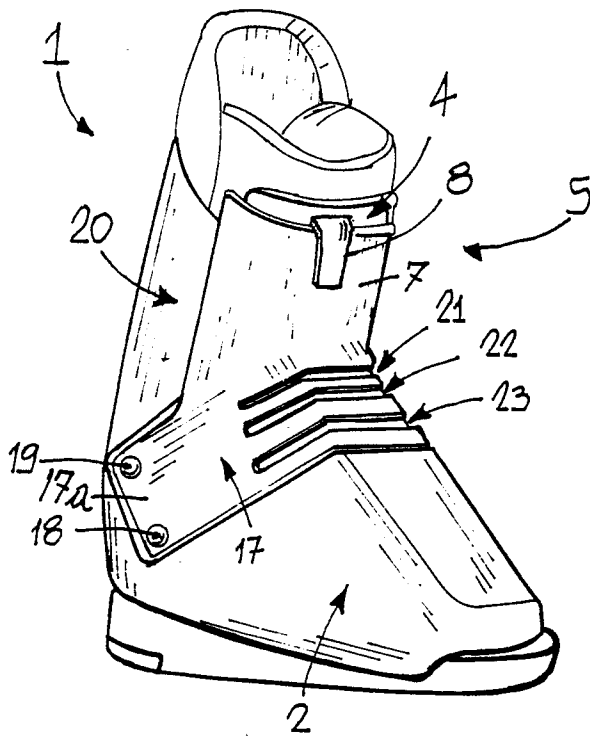


Fig 2

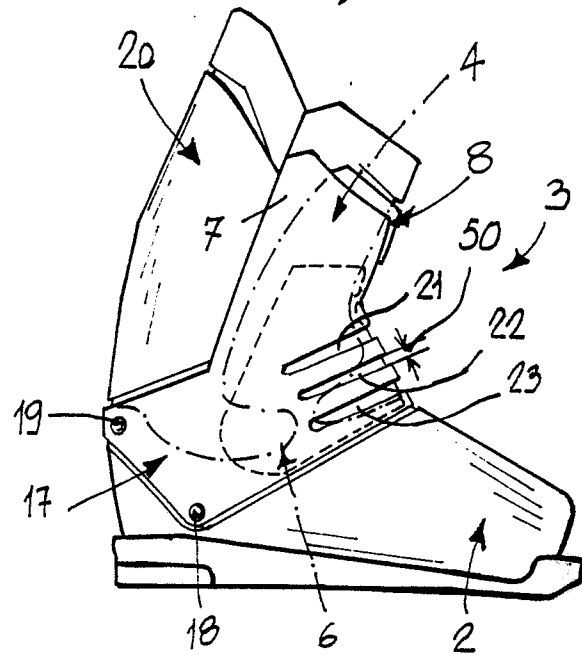


Fig 3

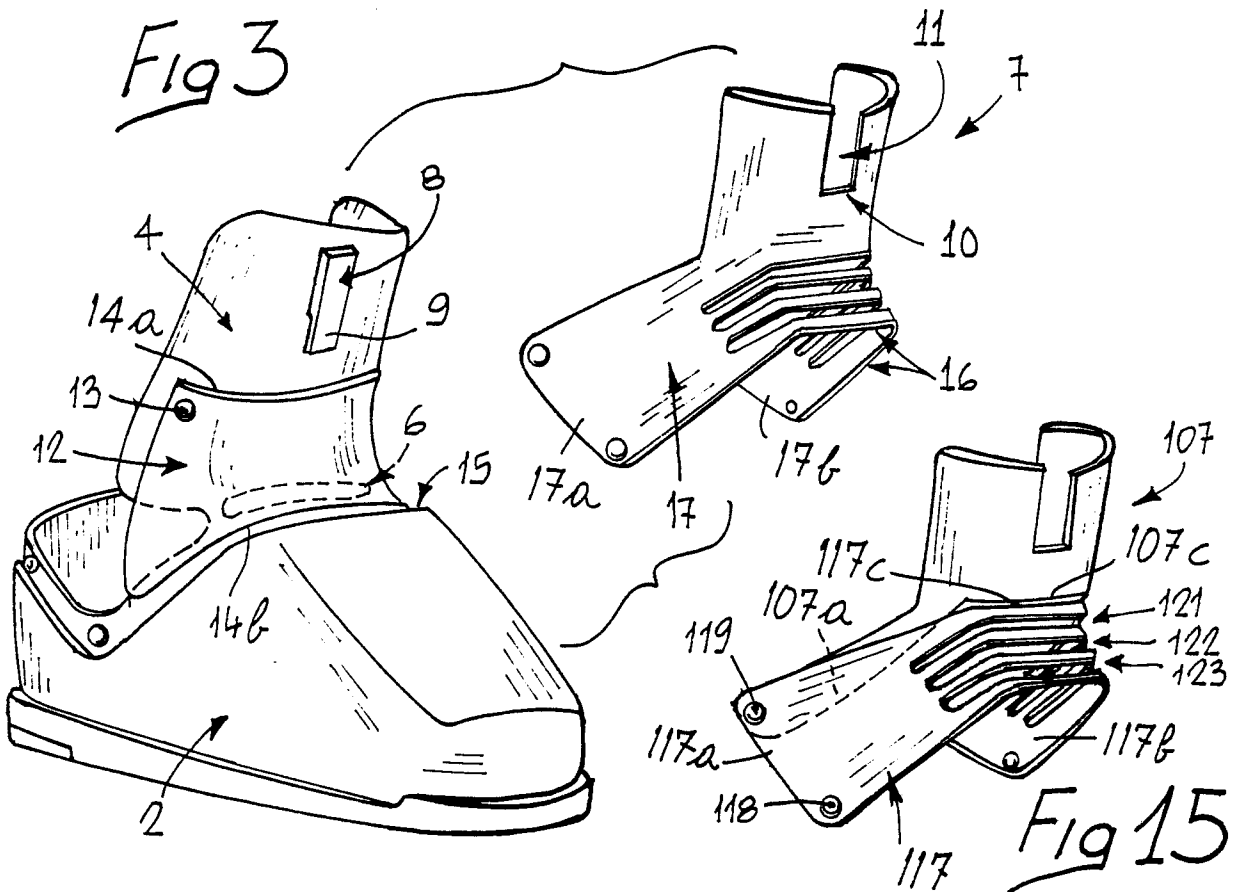


Fig 15

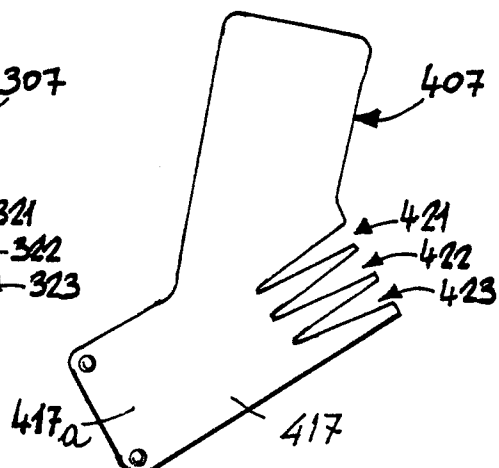
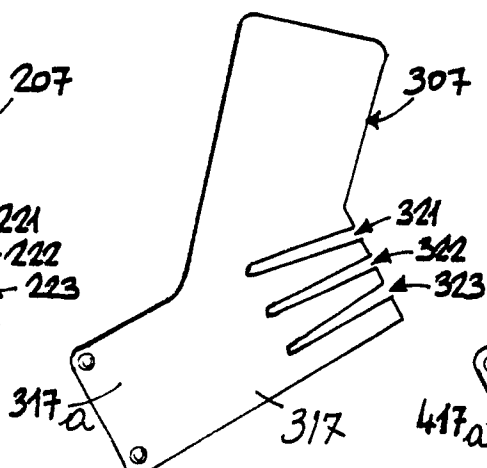
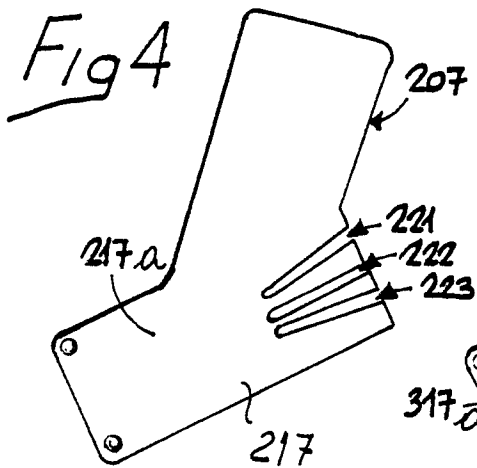


Fig 5

Fig 6

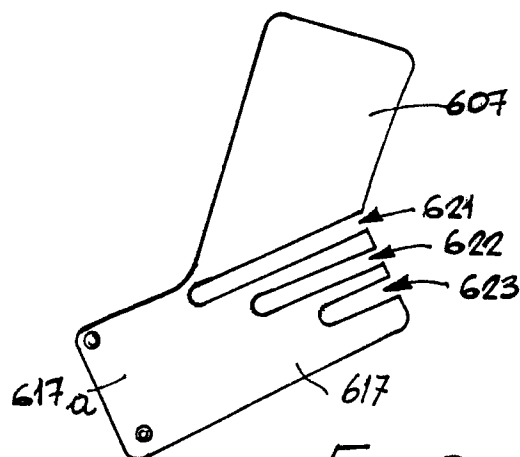
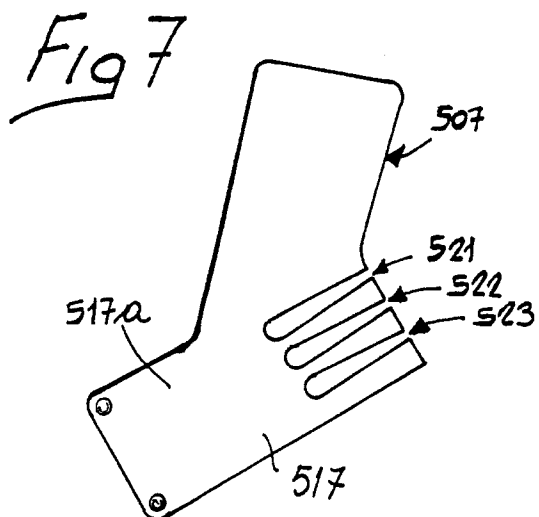


Fig 8

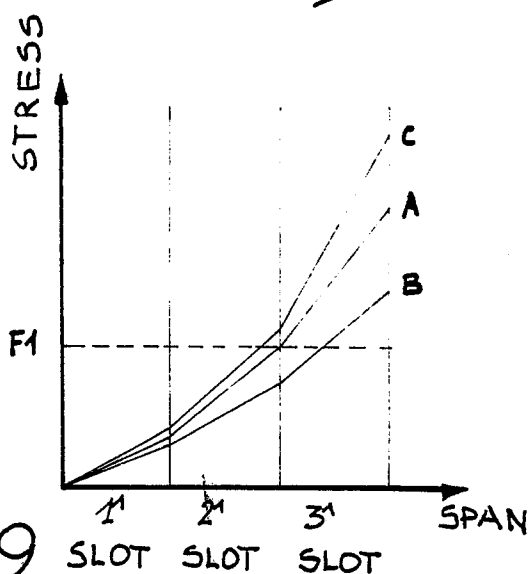
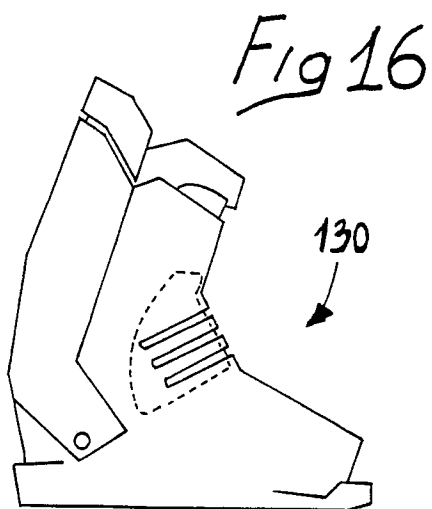


Fig 9

