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(54) Foot Securing device, particularly for ski boots.

(57) A foot securing device for ski boots composed of a shell (3), a front quarter (1), a rear quarter (2) and a rear presser (17). The presser (17) is rearwardly provided with an inclined surface (16) engaging an inclined plane (15) of a pawl (14) which is rotatably associated with a threaded rod (4) which can be rotated directly by the skier. At least one traction element (18) is associated with the pawl (14) and, by embracing the foot instep region, creates a clamp-like locking effect on the skier's leg when the threaded rod is rotated.

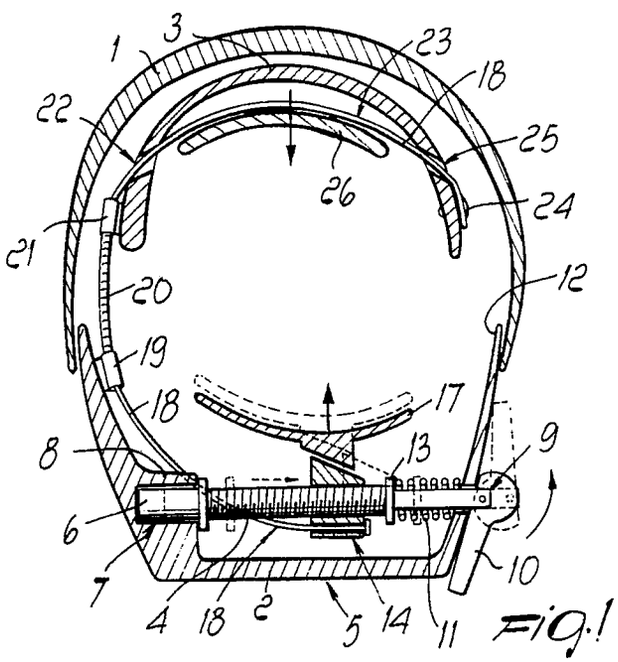

Fig.1

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FOOT SECURING DEVICE, PARTICULARLY FOR SKI BOOTS

The present application relates to a foot securing device, particularly for ski boots having a shell, a rear quarter and a front quarter.

It is currently very important in modern ski boots to provide devices which correctly secure the skier's foot, and in particular the heel, inside the shell so as to allow the optimum transmission of forces from the foot to the ski.

Several devices adapted for this purpose are known; some comprise a knob which is rotatably associated at the back of the rear quarter of the boot and has, at the end of its threaded stem which is internal to the quarter, a presser which interacts with a flap protruding from the shell.

In this known type of device, the actuation of the knob creates a point of pressure which is concentrated in a very small region of the flap, and therefore this device is not adaptable to the various anatomical configurations of the heel and causes pain at the heel when the boot is used for a long time.

As a partial solution to these disadvantages, the same Applicant filed, on July 23, 1985, an Italian Patent Application, No. 22576 B/85, disclosing a ski boot which has the peculiarity of comprising an elongated element extending transversely to the longitudinai extension of the rear quarter of the boot; the elongated element is provided inside the rear quarter and substantially at the heel of the user's foot and is connected to the opposite longitudinal edges of the rear quarter.

This undoubtedly valid device also has a disadvantage though, due to the fact that under stress it deforms the edges of the rear quarter, decreasing the degree of securing, especially during the flexing step in which securing is most needed.

Devices are also known which are constituted by a threaded rod which can be actuated by the skier and with which a pawl is rotatably associated; said pawl has an inclined plane which interacts with a complementarily shaped inclined surface of a presser or flap arranged rearward with respect to the heel.

For example, the Italian Patent Application No. 22769 B/81, filed on August 31, 1981 by this same Applicant, and the French Patent Application Publication No. 2547206 filed on June 10,1983, disclose ski boots having devices of this type.

These known devices also, however, have disadvantages, since they allow to secure the heel but however do not allow to optimally secure the foot inside the boot.

The aim of the present invention is therefore to eliminate the disadvantages described above in known types by providing a device which allows to achieve the optimum securing of the heel and of the foot inside the boot.

Within the scope of the above described aim, a further important object is to provide a device which allows to achieve the optimum securing of the heel of the foot by means of a single actuation.

Another important object is to provide a device which is structurally simple as well as reliable and safe in use.

Still another object is to provide a securing device which associates with the preceding characteristics that of allowing the removal of the foot from the boot while nonetheless keeping unchanged the degree of securing to be achieved when the boot is again worn.

This aim, the objects mentioned and others which will become apparent hereinafter are achieved by a foot securing device particularly for ski boots having a shell, a front quarter and a rear quarter, comprising a threaded rod, a threaded pawl engaging said rod, and a first presser, said pawl having an inclined plane adapted to engage an inclined surface provided at said first presser, said rod having a longitudinal axis, said pawl being movable along said longitudinal axis upon rotation of said rod, to displace said first presser along a direction substantially perpendicular to said longitudinal axis, characterized in that it comprises at least one traction element having one end connected to said pawl, said traction element being adapted to embrace the foot instep region.

Said presser is advantageously constituted by a rear flap associated with the shell or with an inner shoe.

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 drawings, wherein:

figure 1 is a top view of a ski boot sectioned horizontally at the region of the foot instep, with the securing device in the released position;

figure 2 is a schematic isometric view of a ski boot, of the type shown in figure 1, in which the device according to the invention is not shown.

With reference to the figures, the reference numeral 1 indicates the front quarter of a ski boot which is associated, together with a rear quarter 2, with a shell 3.

The device comprises a threaded rod 4 which is associated with the rear quarter 2 and is arranged transversely thereto proximate to the rear surface 5.

Said threaded rod 4 has a first end 6 freely rotatably associated at an adapted seat 7 provided

at a lug 8 which protrudes inside the rear quarter 2.

The second end 9 of the threaded rod 4 furthermore protrudes laterally and externally to the rear quarter 2, and an eccentric lever 10 actuatable by the skier is rotatably associated with said second end.

The threaded rod 4 can therefore move along its axis upon the actuation of the eccentric lever, while its first end 6 is biased within the seat 7 by a spring 11, preferably arranged coaxially to the second end 9 between the internal surface 12 of the rear quarter 2 and an annular flange 13 provided on the threaded rod 4 proximate to the second end 9.

The eccentric lever 10 thus defines two positions: a released position, shown in figure 1, wherein the end 6 of rod 4 is completely inserted in the seat 7; and a securing position, shown with dashed lines in figure 1, wherein the rod 4 is moved towards the right, with reference to the figure, of a length corresponding to the eccentricity of the lever 10.

A threaded pawl 14 is associated with the threaded rod 4 and has an inclined plane 15 at its side facing the foot.

The pawl 14 cannot rotate and only moves along the axis of the threaded rod 4, upon rotation of the same rod 4.

Said inclined plane 15 engages an inclined surface 16 provided at the rear presser or flap 17 which is associated with the shell 3 or with an inner shoe, at the heel region of the foot.

On the opposite side with respect to the inclined plane 15, the end of at least one traction element is associated with the pawl 14; said traction element comprises a cable 18 which extends on the opposite side with respect to the eccentric lever 10 and is guided by a first guide 19 rigidly associated with the internal surface 12 of the rear quarter 2 and is then partially contained within a sheath 20 up to a second guide 21 associated with the shell 3.

After the second guide 21, the cable 18 passes through a first opening 22 which is provided laterally to the shell 3, then has a portion 23 which embraces a foot presser 26 at the foot instep region exits outside the shell through a second opening 25 provided laterally to said shell and is locked by means of an adapted rivet 24.

The use of the device is therefore as follows: once the eccentric lever 10 has been actuated, a movement is imparted to the pawl 14 which causes both the tensioning of the cable 18 and the movement of the flap 17 toward the heel because of the interaction between the inclined plane 15 of the pawl 14 and the inclined surface 16 of said flap.

A clamp-like securing of the skier's foot is thus obtained and can be adjusted by rotating the eccentric lever 10 so as to achieve the best possible securing.

The sheath 20, between the guide 19 associated with the rear quarter 2 and the guide 21 associated with the shell 3, allows to open the quarter, and in particular the rear quarter 3, which otherwise would be locked by the tensioned cable 18.

Figure 1 shows in dashed lines the securing position of the lever 10; to release the foot, it is simply necessary to flip the lever in the released position, shown in full lines in figure 1 without rotating the rod 4 to move the pawl 14 with respect to the rod. In this manner the selected securing strength is "stored" by the device: it is in fact necessary to simply flip back the lever 10 in the securing position (shown in dashed lines) to obtain the previously selected degree of securing.

It has thus been observed that the invention has achieved the intended aim and objects, a device having been provided which allows to achieve an optimum securing of the foot inside the boot by virtue of a combination of the tensioning of a cable and the movement of a flap to lock said foot in a clamp-like manner.

The device is furthermore simple and rapid to adjust according to each skier's specific requirements and is structurally very simple.

The configuration of the device furthermore allows, by moving the rear quarter backward, an easy extraction of the foot, releasing the heel; the device furthermore "stores" the selected degree of securing, allowing to open and close the quarter with no need to perform the securing adjusting each time.

The device according to the invention is naturally susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept.

The dimensions, as well as the materials which constitute the individual components of the device, may also be the most pertinent according to the specific requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Foot securing device particularly for ski boots having a shell (3), a front quarter (1) and a rear quarter (2), comprising a threaded rod (4), a

threaded pawl (14) engaging said rod, and a first presser (17), said pawl having an inclined plane (15) adapted to engage an inclined surface (16) provided at said first presser, said rod having a longitudinal axis, said pawl being movable along said longitudinal axis, upon rotation of said rod, to displace said first presser along a direction substantially perpendicular to said longitudinal axis, characterized in that it comprises at least one traction element (18) having one end connected to said pawl, said traction element being adapted to embrace the foot instep region.

2. Device according to claim 1, characterized in that said threaded rod (4) is arranged transversely to said rear quarter (2) proximate to its rear surface, said threaded rod having a first end (6) rotatably associated and slidable at a seat (7) provided on a lug (8) which protrudes inside said rear quarter, said threaded rod (4) having a second end (9) which protrudes externally and laterally to said rear quarter (2), an eccentric lever (10) being rotatably associated with said second end, said threaded rod further comprising, inside said rear quarter and proximate to said second end, an annular abutment flange (13) for a spring (11) arranged coaxially to said second end and interacting with the internal surface of said rear quarter.

3. Device, according to claim 1, characterized in that said first presser is constituted by a flap (17) provided on said shell at the rear, said first presser being a rear presser substantially acting on the heel of the foot.

4. Device, according to claim 1, characterized in that said first presser is constituted by a flap (17) provided on an inner shoe inside said shell, said first presser being a rear presser substantially acting on the heel of the foot.

5. Device according to claim 2, characterized in that said end of said at least one traction element, constituted by a cable (18) which extends in the opposite direction with respect to said second end (9) of said threaded rod (4), is associated with said pawl (14) on an opposite side with respect to said inclined plane (15).

6. Device according to claim 1, characterized in that at least one traction element is constituted by a cable (18) affecting a first guide (19) which protrudes internally and laterally to said rear quarter (2), said cable being subsequently embraced by an adapted sheath (20) and protruding laterally and externally to said shell (3) at a second guide (21).

7. Device according to claim 6, characterized in that said cable (18) affects, after said second guide (21), a first opening (22) which is provided laterally to said shell (3), said cable having a portion (23) which embraces the instep region of the foot and then protrudes from said shell through an adapted second opening (25), said cable being fastened to said shell, at a rivet (24).

8. Device, according to one or more of the preceding claims, characterized in that it comprises a second presser, said traction element (18) acting on said second presser.

9. Device, according to claim 7, characterized in that a second presser, constituted by a foot instep presser (26), is provided at said portion (23) of said cable (18) which embraces the instep region of the foot.

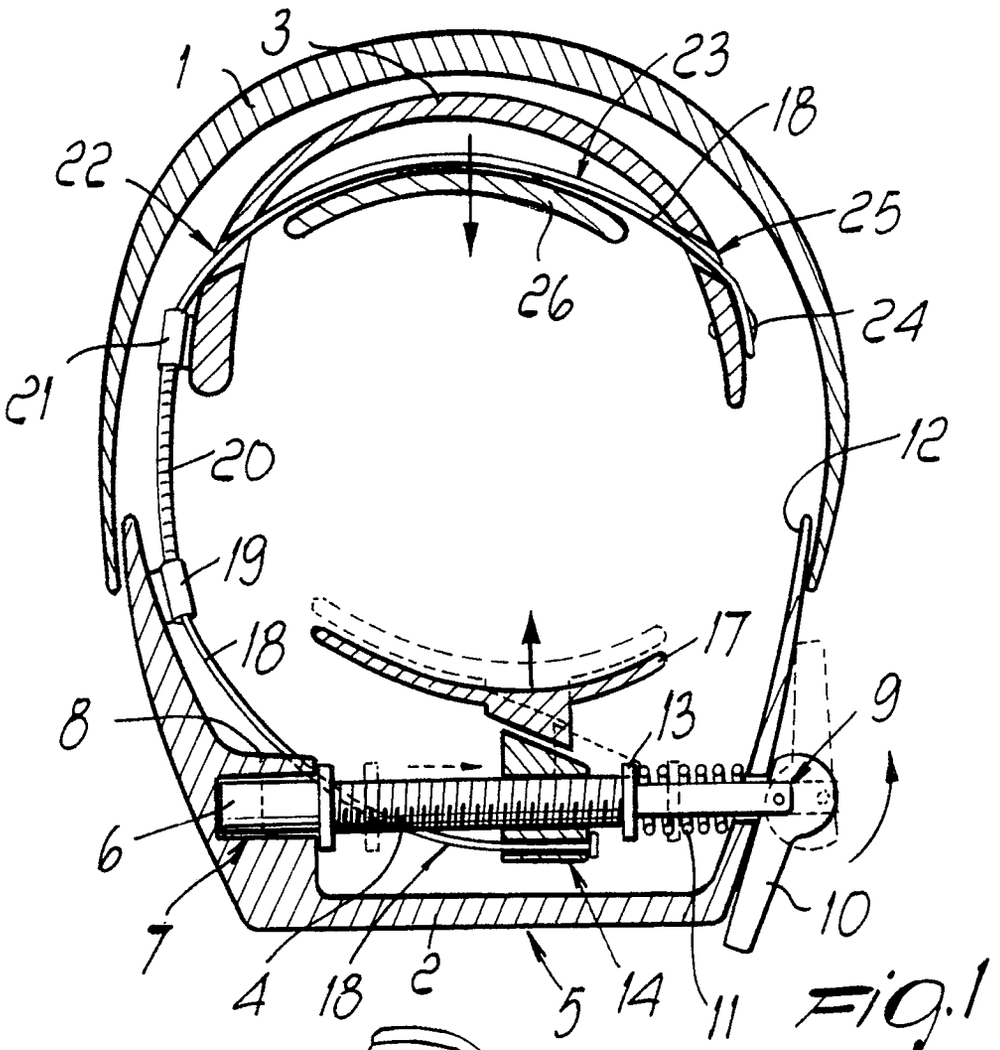
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Fig.1

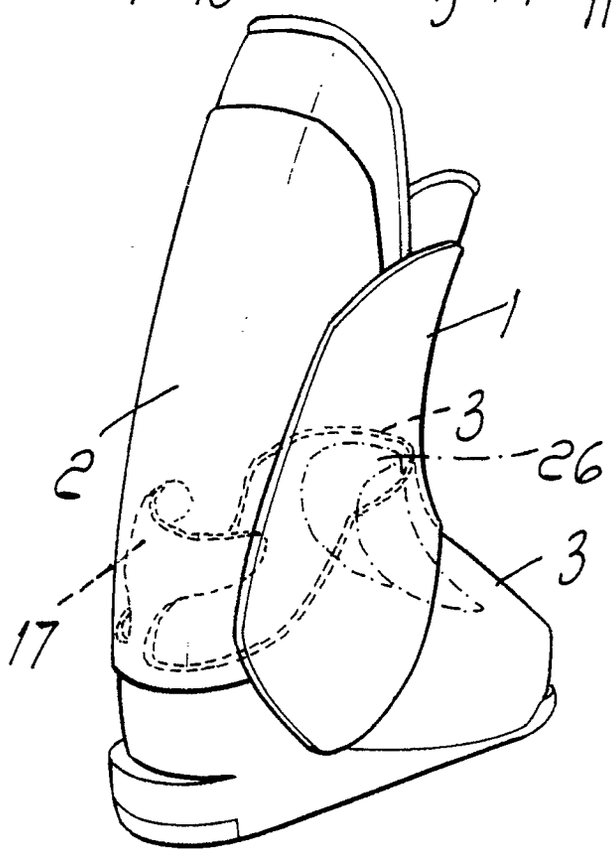
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Fig.2