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(54) **Flex adjusting device particularly for rear entrance ski boots.**

(57) A device for adjusting the degree of flex, particularly in rear entrance ski boots, comprises a friction element (1,20,54,55) associated with the inner surface of the front quarter (2) of a ski boot and acting in rubbing contact with a backplate (10,30,50) attached to the ski boot shell (6).

Also provided are adjustable calibration elastic means (12,40,60) for controlling the contact pressure between the friction element (1,20,54,55) and backplate (10,30,50).

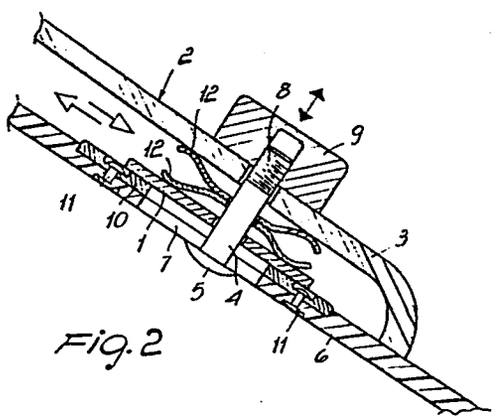

Fig. 2

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"FLEX ADJUSTING DEVICE PARTICULARLY FOR REAR ENTRANCE SKI BOOTS"

This invention relates to a flex adjusting device particularly for rear entrance ski boots.

As is known, rear entrance ski boots are finding ever increasing popularity comprising, in their commonest form, a shell having front and rear quarters connected thereto.

Such ski boots pose, however, considerable problems as regards the incorporation of suitable devices for adjusting the amount of flex, flex referring herein to the bias force opposed by a ski boot to the flexing movement of the quarter about a substantially horizontal axis lying perpendicularly to the ski length direction.

Prior devices tend to be excessively bulky, difficult to adjust, and unable to provide for continuous and quick control of the amount of flex.

It is a primary object of this invention to obviate such prior shortcomings by providing a flex adjusting device which is easily incorporated to a ski boot without involving any major structural alterations and is quite convenient to use.

A further object of the invention is to provide such a device which can also be adjusted in adverse environmental conditions, such as are normally encountered in the skiing field, even by a person donning mittens.

It is another object of the invention to provide a device as indicated, wherein the flex-opposing bias force from the ski boot can be adjusted continuously

over a wide range so as to comfortably meet any contingent requirements by the user.

These and other objects, such as will be apparent hereinafter, are achieved by a flex adjusting device particularly for rear entrance ski boots, according to the invention, characterized in that it comprises a friction element associated with the bottom surface of the front quarter of a ski boot and acting in rubbing contact with a backplate attached to the shell of said ski boot, adjustable calibration elastic means being also provided to control the contact pressure between said friction element and said backplate.

Further features and advantages will be more readily understood from the following detailed description of a flex adjusting device particularly for rear entrance ski boots, with reference to the accompanying illustrative and not limitative drawings, where:

Figure 1 is a schematical perspective view of a ski boot incorporating a flex adjusting device according to the invention, mounted on the front thereof;

Figure 2 is a sectional view of the device of Figure 1;

Figure 3 is a perspective view showing schematically a ski boot with this flex adjusting device mounted laterally thereof;

Figure 4 is a sectional view of the device of Figure 3; and

Figure 5 shows this device as comprising a variable thickness friction plate.

With reference to the drawing views, and in particular to Figures 1 and 2, a flex adjusting device particularly for rear entrance ski boots, according to the invention, comprises a friction element comprising a friction plate 1 which is located below the toe portion of the front quarter 2 of a ski boot. More in detail, in the embodiment shown in Figures 1 and 2, the friction plate 1 is located at the front upper portion of the boot, at a front projection 3 defined by the quarter itself.

The cited friction plate 1 is associated with the shank 4 of a throughgoing pin which has its enlarged head 5 located inside the shell 6. The shank 4 is passed slidably through an elongate slot 7 defined in the front upper portion of the shell 6.

The shank 4 has, at its other end, a threaded portion 8 wherewith a control knob 9 engages rotatably which acts at the top of said front quarter 2, at the projection or protuberance 3 thereof.

The cited friction plate is in rubbing contact with a backplate 10 located on the shell 6 and being connected to the shell by fastening means comprising rivets 11 or the like elements.

The backplate 10 is also formed with the throughgoing slot 7 to allow for the sliding movement of the shank 4.

Between the friction plate 1 and inner surface

of the quarter 2, elastic means are active which comprise a pair of juxtaposed disk springs 12 applying an elastic thrust which in practice controls the contact pressure between the friction plate 7 and backplate 10, thus practically adjusting the braking action applied between the front quarter 2 and shell 6 during the flexing movement.

It may be appreciated that the more compressed are the springs 12, the greater becomes said braking action, thereby disfavouring flexing, whereas by attenuating the compression of the springs 12 flexing is facilitated.

With reference to Figures 3 and 4, the flex adjusting device is positioned laterally of the front quarter, and has a friction element comprising a friction plate 20 connected to a small supporting plate 21 attached, as by means of rivets 22 or the like elements, to a protuberance 23 defined on the quarter.

Through the friction plate 20, there extends the shank 24 of a pin which is formed at one end with an enlarged portion 25 adapted to engage with the inner face of a friction backplate 30 attached to the shell 6 and formed with an elongate slot 31 to permit sliding of the shank 24.

At the region occupied by the elongate slot 31, the shell 6 is advantageously formed with a cutout 32 to avoid interference with the enlarged portion.

The shank 24 has, at its other end, a threaded portion 35 wherewith an adjustment ring nut 36 engages

which is accessable from the outside of the protuberance 23 and acts against elastic means comprising a bell-like spring 40 carried directly on the supporting plate 21.

Here again, by adjusting the ring nut 36, the spring 40 is compressed to a greater or lesser extent, thus varying the pressure exerted by the friction plate 20 on the friction backplate 30.

With reference to Figure 5, associated with the shell is a friction plate 50, defining a varying thickness along the direction of longitudinal development, which preferably increases in thickness toward the shell toe end. The plate 50 defines an elongate slot 51 wherethrough a threaded stem 52 is passed which has an enlarged end portion 53.

The stem 52 is passed through a lower friction disk 54 and upper friction disk 55, which are in rubbing contact relationship with the plate 50 and supported on the quarter 2. Further, the stem 52 engages in a threaded receptacle 56 defined in a gripping element 57 carried rotatably on the quarter 2.

Between the enlarged portion 53 and disk 54, with the optional interposition of a washer 58, there are arranged to act elastic means comprising an adjustable calibration spring 60 which can be calibrated by operating the grip 57 to cause the stem 52 to translate, thereby varying the frictional force applicable between the plate 50 and disks 54,55.

Advantageously, the plate 50 has at least one inclined surface, and the contacting disk correspondingly presents a matching juxtaposed inclined surface.

With this arrangement, the flex adjusting effect is enhanced.

The use of the device according to the invention is quite simple. In fact, the user is simply required to adjust the knob 9 or ring nut 36 or grip 57 in conformity with his/her own requirements by applying a desired compression of the elastic means and hence adjusting the frictional pressure between the friction plate 1 and backplate 10 or between the friction plate 20 and friction backplate 30 or between the plate 50 and disks 54 and 55, thus changing flexure as required with an action which practically varies the frictional pressure between parts in mutual rubbing contact.

It may be appreciated from the foregoing description that the invention achieves its objects, and in particular the fact should be pointed out that a device has been provided whereby the flexibility can be adjusted in an extremely simple and quick manner through the utilization of the friction differential, occurring as the applied pressure is varied, between a friction plate and respective backplate attached to the boot shell.

In practicing the invention,any materials, dimensions and contingent shapes, may be any selected ones and used to meet individual requirements, providing that they are compatible with the specific intended application.

CLAIMS

1. A flex adjusting device particularly for rear entrance ski boots, characterized in that it comprises at least one friction element (1,20,54,55) associated with the bottom surface of the front quarter (2) of a ski boot and acting in rubbing contact with a backplate (10,30,50) attached to the shell (6) of said ski boot, adjustable calibration elastic means (12, 40,60) being also provided to control the contact pressure between said friction element (11,20,54,55) and said backplate (10,30,50).

2. A flex adjusting device, according to Claim 1, characterized in that said friction element comprises a friction plate in rubbing contact with a backplate (10) attached to said shell (6), passed through said backplate (10) being the shank (4) of a pin having its head (5) received inside said shell (6) and slidable in an elongate slot (7) defined by said shell (6) and said backplate (10), said elastic means (12) acting between said friction plate (1) and the inner surface of said front quarter (2).

3. A flex adjusting device, according to the preceding claims, characterized in that said pin (4,5) has a thread (8) formed at its outward end, wherewith there engages a control knob (9) acting on the outer surface of said quarter (2).

4. A flex adjusting device, according to one or more of the preceding claims, characterized in that said elastic means (12) comprise a pair of springs (12) oppositely positioned around said pin and acting

respectively on said friction plate (1) and the inner face of said quarter (2).

5. A flex adjusting device, according to one or more of the preceding claims, characterized in that said friction element comprises a friction plate (20) carried on a small supporting plate (21) connected to the inner face of said front quarter (2).

6. A flex adjusting device, according to one or more of the preceding claims, characterized in that it comprises a shank (24) passed through said friction plate (20) and through an elongate slot (31) defined by said friction backplate (30), internally of said shell (6) said shank (24) having an enlarged portion (25) adapted to engage with the inner face of a friction backplate (30), said shank (24) having at its other end a threaded portion (35) wherewith there engages rotatably a ring nut (36) acting on said elastic means (40) interposed between said ring nut (36) and said friction plate (20).

7. A flex adjusting device, according to one or more of the preceding claims, characterized in that said at least one friction element comprises a lower friction disk (54) and an upper friction disk (55) engaging with the juxtaposed faces of a backplate formed by a friction plate (50), defining a varying thickness in the direction of longitudinal development.

8. A flex adjusting device, according to Claim 7, characterized in that said friction plate (50) has at least one inclined surface, the contacting friction disk (54 or 55) having a matching inclined surface.

9. A flex adjusting device, according to one or

more of the preceding claims, characterized in that it is located at the toe portion of said front quarter (2).

10. A flex adjusting device, according to any of the preceding claims, characterized in that it is located laterally of said front quarter (2).

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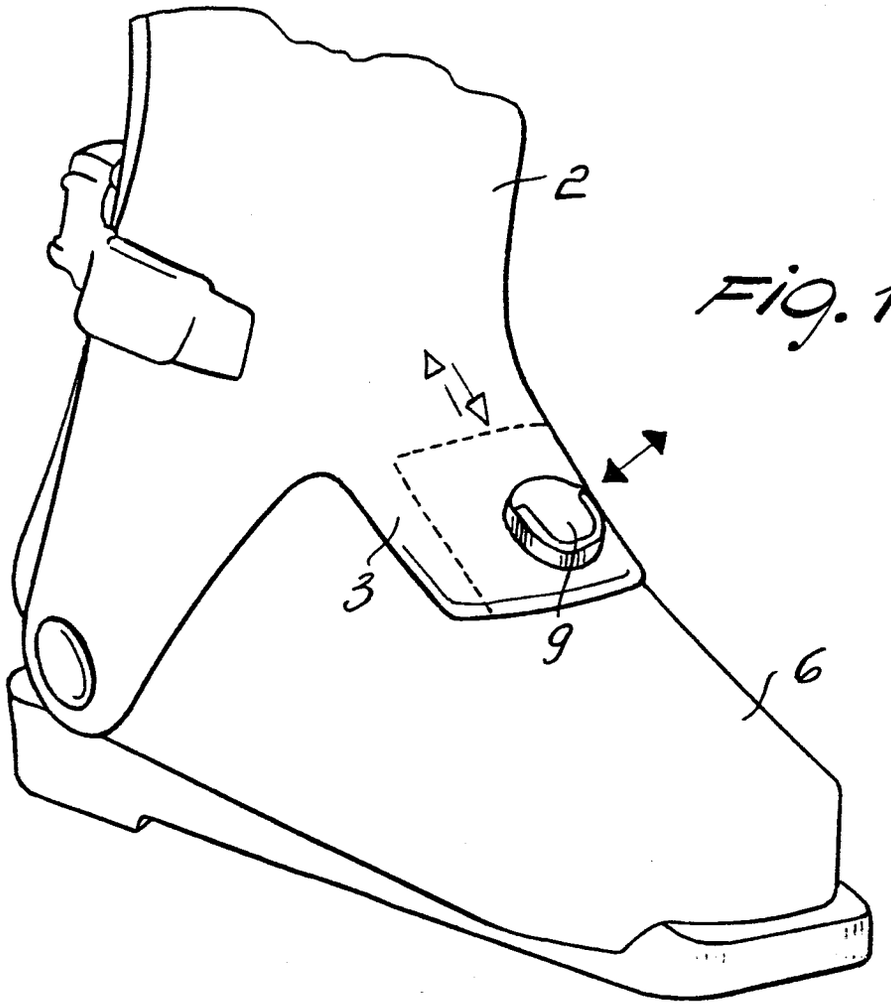

Fig. 1

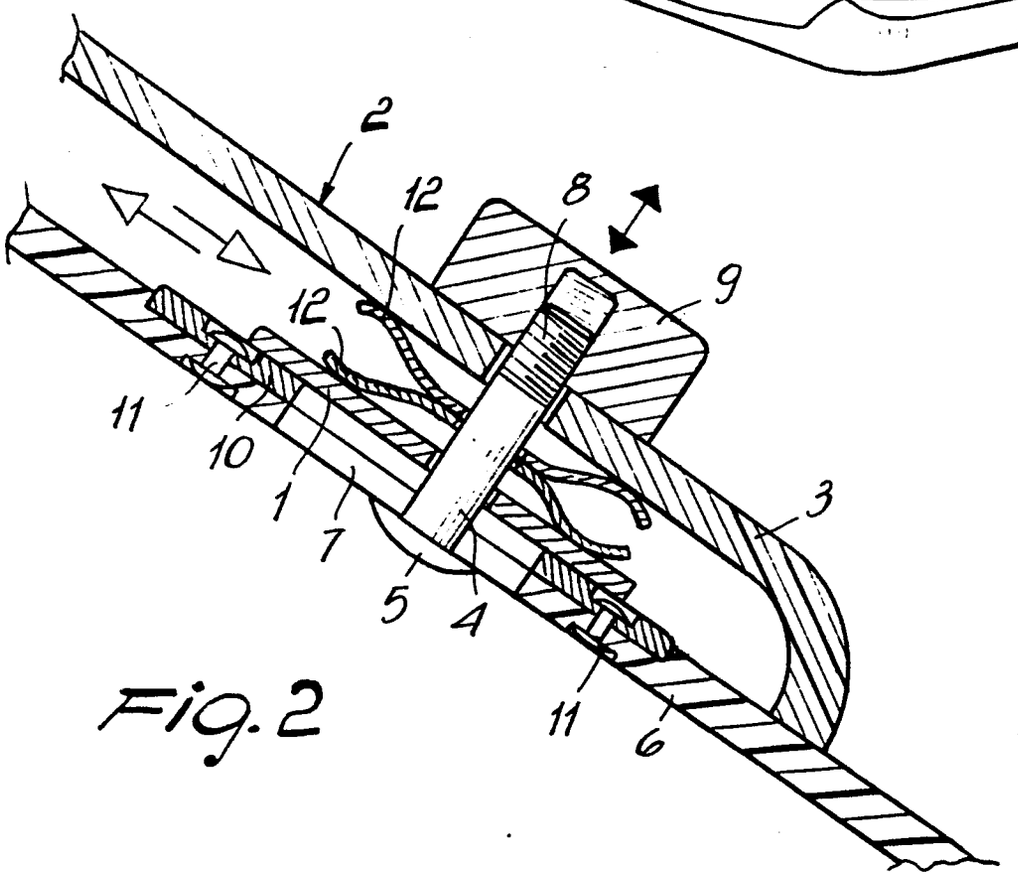

Fig. 2

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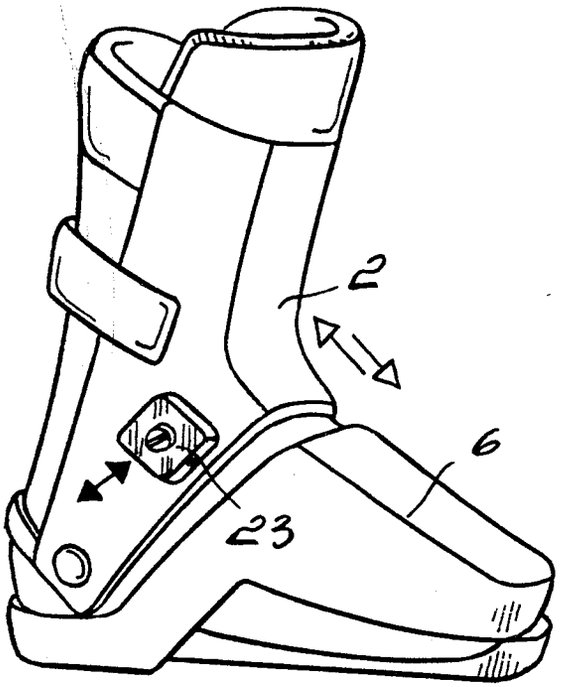
Fig. 3



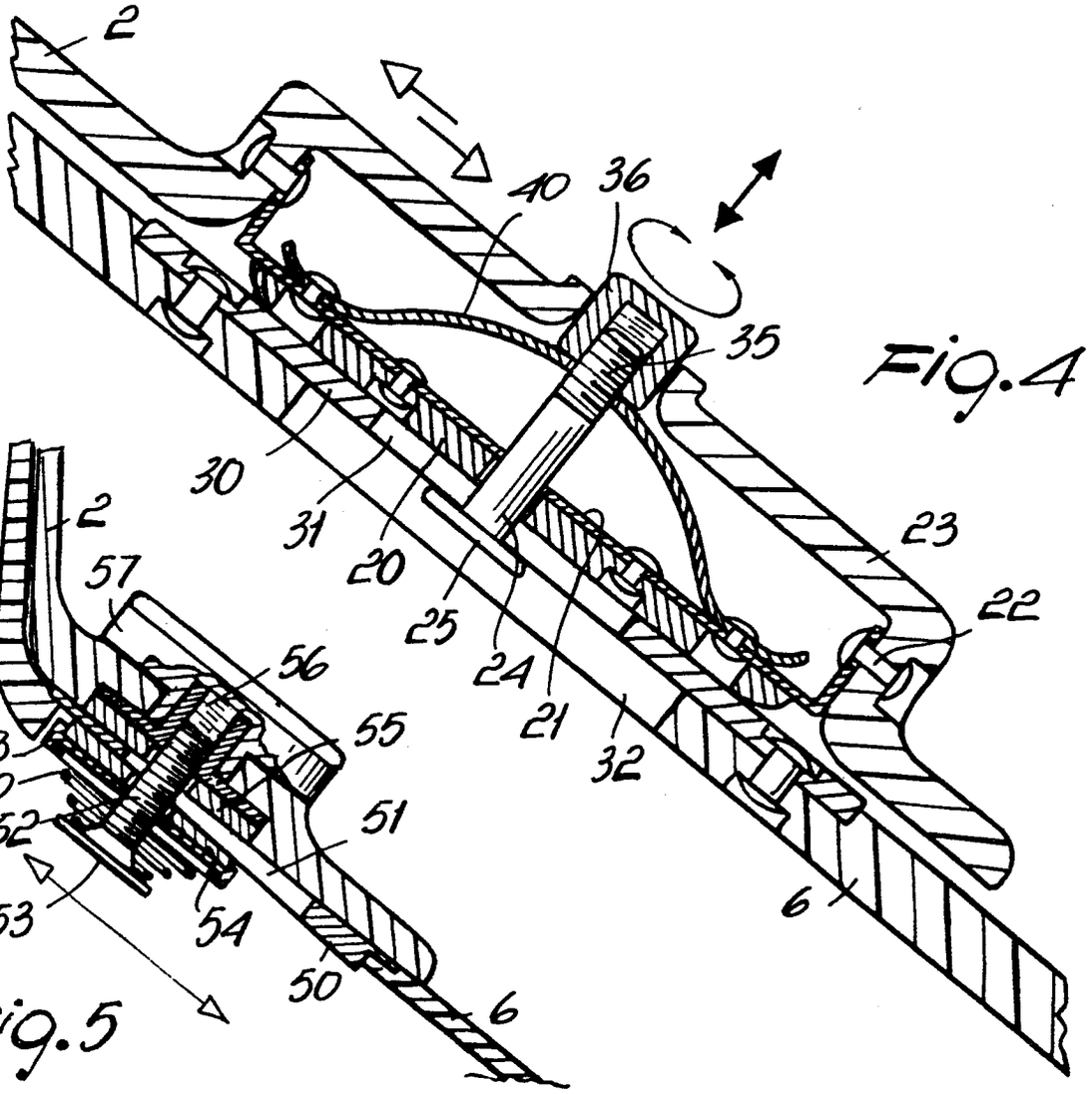


Fig. 4

Fig. 5

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EUROPEAN SEARCH REPORT

0 085 184

Application number

EP 84 11 0741

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	CH-A- 512 204 (J. RIEKER) * column 6, lines 5-55; figures 6-8 *	1,10	A 43 B 5/04
A	US-A-4 186 501 (G.P.J. SALOMON) * column 4; figures 1-11 *	1-10	
A	US-A-4 334 368 (E.L. CHALMERS) * abstract; figures 1-4 *	1-10	
A	AT-B- 296 820 ("HUMANIC" HEINISCH & MAYER) * claims 1-8; figures 1-12 *	1-10	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			A 43 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18-10-1984	MALIC K.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
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