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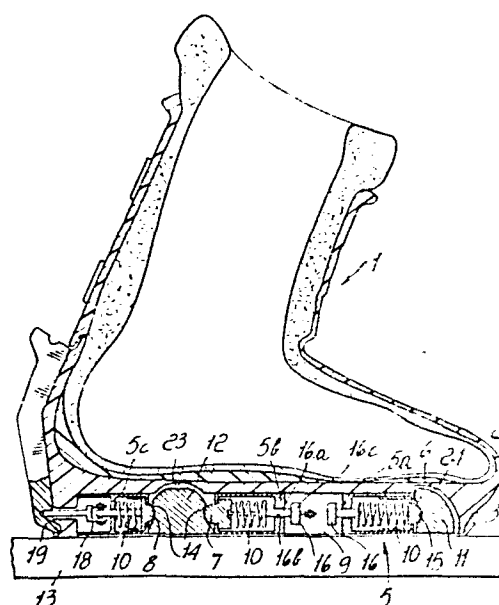
71 Applicant: **NORDICA S.p.A**  
**Via Piave, 33**  
**I-31044 Montebelluna (Province of Treviso)(IT)**

72 Inventor: **de Mattheis, Filippo**  
**Via Fonte Baiano 14**  
**I-64100 Teramo(IT)**

74 Representative: **Modiano, Guido et al,**  
**MODIANO, JOSIF, PISANTY & STAUB Modiano &**  
**Associati Via Meravigli, 16**  
**I-20123 Milan(IT)**

54 **Ski boot structure particularly for downhill skiing.**

57 The invention is concerned with a ski boot structure particularly intended for downhill skiing, which comprises a boot shell (2), a boot sole (3), and an inclinable boot quarter (4) oscillably associated with the shell (2) for oscillation relatively thereto; the sole (3) has members (5) for binding the ski boot (1) to the body of a ski (13), which include at least three small plungers (6,7,8) arranged to move coaxially within a guide (9) internally of the sole (3) against and by the action of a spring (10) for snap engagement with binding blocks (11,12) associated with the ski body (13).



*Fig. 1*

"SKI BOOT STRUCTURE PARTICULARLY FOR DOWNHILL SKIING"

The present invention relates to a ski boot structure particularly for downhill skiing.

Known are ski boots which incorporate, internally of their soles or externally thereof,  
5 devices adapted for engagement with one or two binding members provided on the ski body.

Such prior devices usually comprise movable elements which engage with a snap action in recesses formed in the binding members owing to a pressure force  
10 exerted on said elements by elastic means, and specifically by spring means.

More in detail, the binding member's recesses wherein such movable elements engage, are provided on two opposed faces or areas of the binding member,  
15 and consequently, the movable members are located on opposed sides with respect to each other on the binding member itself.

With that binding structure, the binding member usually engages at a substantially central region of the  
20 boot and creates inherent problems due to the fact that all of the stresses resulting from the movements imparted to the ski by the skier while skiing are transferred through a single member, which makes it very difficult to calibrate the springs according to the skier's weight and  
25 skiing style or action, and according to the force required to release the ski from the boot in an optimum fashion in the event of the skier falling.

To compensate for these problems, bindings have been developed which have two binding members rigidly

attached to the ski body, wherein the recesses to be engaged by the movable elements are arranged to confront one another in spaced apart relationship such that the forces brought about to control the skis directionally are divided between both binding members and the moment of force which resists the force tending to release the ski from the boot can be made greater, thereby the springs of the movable elements do not require to be calibrated for maximum values, which reflects favourably on the reliable release of the ski from the boot in the event of a fall.

However, the latter binding types, while improving considerably the possibility of meeting at one time both of the primary prerequisites of a ski binding for downhill skiing, namely a reliable release combined with a good ability to transfer the commands imparted to the skis by the skier, have the drawback that they cannot differentiate the forces imparted by the skier while skiing between the binding member which is closest to the boot toe end and the binding member closest to the boot heel region.

The aim underlying this invention is to obviate such prior drawbacks by providing a ski boot structure particularly for downhill skiing which can split the forces involved in securing the boot on a ski body in a different fashion.

Within the above aim, it is an important object of the invention to provide a ski boot structure whose members for hooking to a ski body provide an

increased binding force close to the heel and a lesser one close to the boot toe.

Another object of the invention is to provide a ski boot structure which affords reliable releasing from  
5 a ski body in the event of the skier falling.

A not least object of the invention is to provide a ski boot structure having a sole which can be made shorter than the longitudinal extension of the boot shell in order to afford an improved ease of walking for the wearer.

10 The above aim, and these and other objects are achieved by a ski boot structure particularly for downhill skiing, comprising a boot shell, a boot sole, and a quarter associated oscillably with said shell, said sole having binding members for binding the boot  
15 on a ski body, characterized in that said binding members include at least three small plungers arranged to move coaxially within a guide internally of said sole against and by the action of elastic means for snap engagement with binding blocks associated with  
20 said ski body.

Further features and advantages of the invention will become apparent from the following description of a preferred though not exclusive embodiment of the boot structure according to this invention, to be  
25 read in conjunction with the accompanying illustrative and not limitative drawings, where:

Figure 1 is a partly sectional side elevation view of the boot structure showing the binding members of this invention inside the sole;

Figure 2 is a partly sectional plan view of the

sole of the boot structure according to the invention showing the inventive binding members;

Figure 3 is a bottom plan view of the cover element for the sole of the boot structure according to the invention; and

Figure 4 is a plan view of the binding blocks associated with a ski body, according to the invention.

With reference to the drawing figures, a boot structure according to the invention, as generally designated with the reference numeral 1, comprises a shell 2 whereto a sole 3 is rigidly attached and an inclinable quarter 4 associated oscillably with the shell 2.

Advantageously, the sole 3 has internally mounted binding members, generally indicated at 5, which comprise at least three small plungers 6, 7 and 8 arranged to move coaxially with respect to each other within a guide 9 against and by the action of elastic means, specifically springs 10, accommodated in housings 5a, 5b, 5c.

The heads of the plungers are adapted for snap engagement with first and second binding blocks 11 and 12 respectively which are conveniently associated with the body of a ski 13.

The first plunger 7 and second plunger 8 are arranged such that their end heads confront each other and have a rounded shape to snap engage in seats 14 provided in the binding element 12.

Likewise, the third plunger 6 has a rounded terminating head adapted to engage in a seat 15

provided in the binding element 11.

It should be also pointed out that said small plungers 6,7 and 8 each have a tubular adjustment element 16, comprising an externally threaded stem 16a,  
5 threadably engaging a correspondingly threaded seat 16b, provided in the housings 5a-c, and having an enlarged extremity or thumb-wheel 16c, the rotation whereof causes the threaded portion to move the end of the spring 10  
10 towards or away from the plunger 5,6,7 and is thus effective to calibrate the force exerted by the springs 10 according to the skier's requirements.

The binding members 5 also have associated therewith a lever system for moving the plungers 6,7 and 8 manually, and which specifically comprises a first rod 17 passing  
15 through a tubular adjustment element 16 and being rigidly associated with the first plunger 7 and a second rod 18, rigidly associated with the second plunger 8, passing through an adjustment element 16 and having the opposed end thereof pivotally associated with a release lever 19  
20 connected pivotally to the sole 2 proximately to the skier's heel.

Obviously, calibration of the force exerted by the springs 10 in the housings 5b,5c could also be achieved by providing a thread engagement relationship between the  
25 rods 17,18 and the interior of the stem 16a of the adjustment element 16, and permitting the latter to slide in the seat 16b provided in the housings.

The first rod 17 has its free end journalled to one end of a small plate or link 20, in turn journalled to the  
30 sole 3, the opposed end of said plate being journalled to

a first end of a bar 21 the other end whereof is pivotally connected to said release lever 19, so as to produce, on turning the release lever 19, simultaneous displacements of the plungers 7 and 8 in opposite directions and hence disengage the heads of the plungers from the binding element 12 and allow, therefore, the boot and accordingly the binding members associated therewith, to be separated from the ski body.

In order to prevent the binding members from suffering damage due to dirt or foreign matter as the skier walks over snow-covered or clear ground, the sole 2 is advantageously provided with a cover element 22 having a circular opening 23 at the heads of the plungers 7 and 8 and a semicircular opening 24 at the plunger 6, adapted to define areas wherein the binding elements 11 and 12 are insertable.

Merely by way of example, it is further pointed out that the seats 14 of the binding element 12 are located diametrically opposed to each other and coaxial with the seat 15 in the binding element 11.

In order then that any snow deposits may not hinder hooking on the binding blocks 11 and 12, the latter have on their surfaces small channels 25 effective to eject such deposits during their insertion through the respective circular and semicircular openings, since the latter have substantially the same size as the binding block 11 and 12.

Conveniently, the binding block 12 is slideably movable along a guide 30, such that it can be moved towards and away from the binding block 11 according to the boot's size and therefore, the sizes of the hooking members provided in the sole.

It has been ascertained in practice that the ski boot structure according to the invention is particularly advantageous in that it provides the skier with hooking members which have three small plungers, two of which,  
5 namely the plunger 7 and plunger 8, are in practice located close to the heel region of the skier's foot, in which region the greatest stresses are transferred between the boot and ski body, while providing on the binding block 11, i.e. close to the toe of the boot where stresses are  
10 much lower, a lower binding force effective to facilitate a possible release of the boot from the ski body in the event of the skier falling.

The invention herein is susceptible to many modifications and changes without departing from the scope of  
15 the inventive concept; furthermore, all of the details are replaceable with technically equivalent elements. In practicing the invention, any suitable materials and dimensions may be used contingent on requirements and the state of the art.

CLAIMS

1           1. A ski boot structure particularly for downhill  
2 skiing, comprising a boot shell (2), a boot sole (3),  
3 and a quarter (4) associated oscillably with said shell  
4 (2), said sole having binding members (5) for binding  
5 the boot on a ski body (13), characterized in that said  
6 binding members (5) include at least three plungers (6,7,8)  
7 arranged to move coaxially within a guide (9) internally  
8 of said sole (3) against and by the action of elastic  
9 means for snap engagement with binding blocks (11,12)  
10 associated with said ski body (13).

1           2. A boot structure according to Claim 1, charac-  
2 terized in that it comprises at least first and second  
3 plungers (7,8) of said at least three plungers (6,7,8)  
4 having heads thereof confronting each other.

1           3. A boot structure according to Claim 1, charac-  
2 terized in that said at least three plungers (6,7,8)  
3 each have an adjusting element (16) for calibrating said  
4 elastic means (10).

1           4. A boot structure according to Claim 1, charac-  
2 terized in that said binding members (5) comprise a  
3 lever system (17-20) for manually moving at least said  
4 first and second plungers (7,8).

1           5. A boot structure according to Claim 4, charac-  
2 terized in that said lever system comprises a first  
3 rod (17) associated with said first plunger (7) and a  
4 second rod (18) associated with said second plunger (8)  
5 and having the opposed end associated with a release lever  
6 (19) mounted pivotally to said sole (3), said first rod  
7 (17) having its free end journaled to one end of a

8 plate (20) journalled to said sole (3), the opposed  
9 end of said plate (20) being journalled to a first end  
10 of a bar (21) the second end whereof is connected to  
11 said release lever (19).

1 6. A boot structure according to Claim 2, charac-  
2 terized in that said sole (3) has a covering element  
3 (22) comprising a circular opening (23) at said heads  
4 of said first (7) and second (8) plungers and a semi-  
5 circular opening (24) at a third plunger (6) of said at  
6 least three plungers (6,7,8).

1 7. A boot structure according to Claim 1, charac-  
2 terized in that said binding members comprise first and  
3 second binding blocks (11,12) each formed with seats (14)  
4 for the snap-action retention of heads of said at least  
5 three plungers (6,7,8).

1 8. A boot structure according to Claim 7, charac-  
2 terized in that said seats in said second block (12)  
3 are located diametrically opposedly each other.

1 9. A boot structure according to Claim 7, charac-  
2 terized in that said first and second blocks (11,12)  
3 have surface channels (25) formed thereon to eject snow.

1 10. A boot structure according to Claim 7, charac-  
2 terized in that said first and second blocks (11,12)  
3 have substantially the same size as said circular opening  
4 (23) and semicircular opening (24), respectively.

1 11. A boot structure according to Claim 7, charac-  
2 terized in that said first block (12) is slideably  
3 movable on a guide (30) rigidly associated with said  
4 body (13) of said ski to and away from said second block  
5 (11).

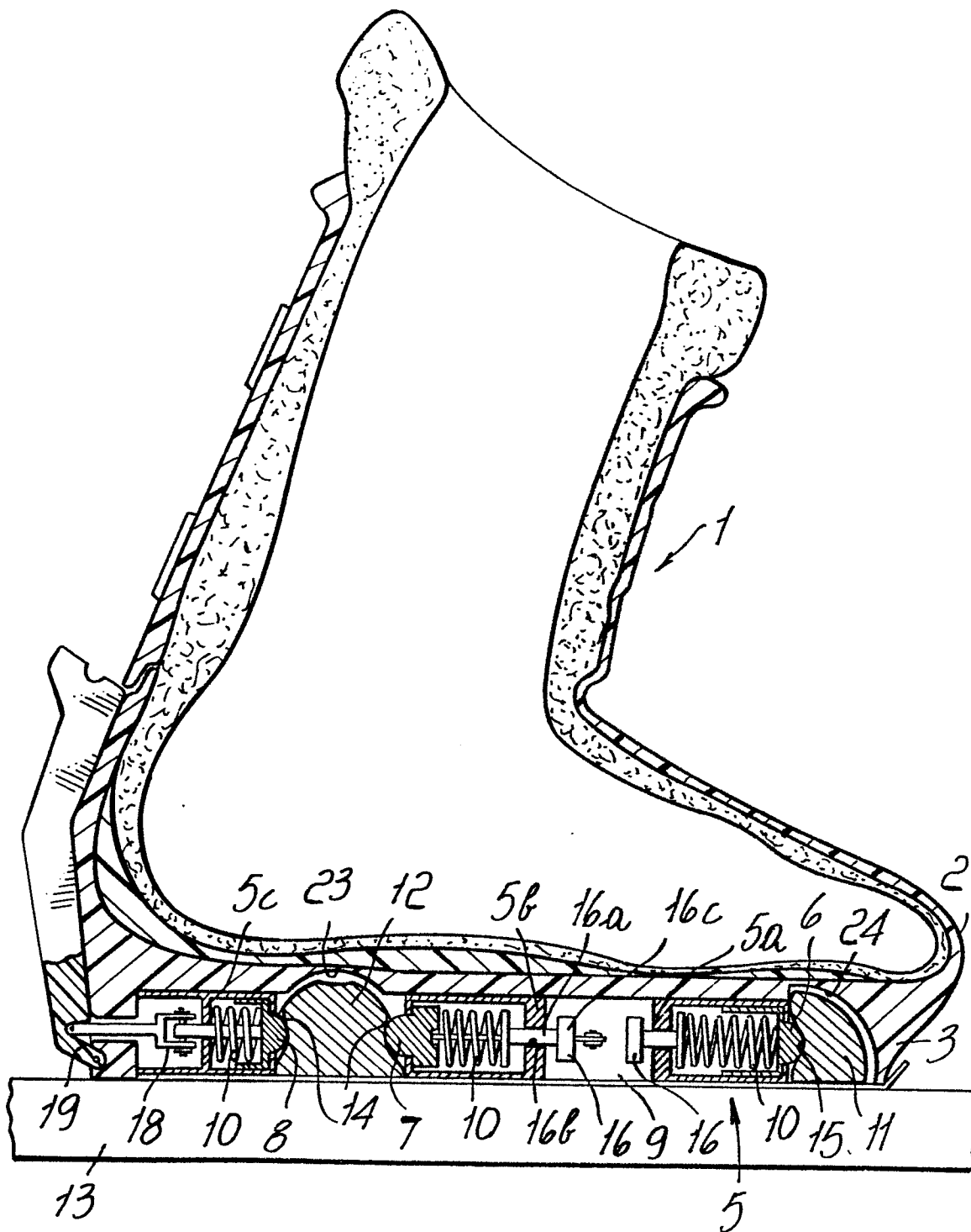
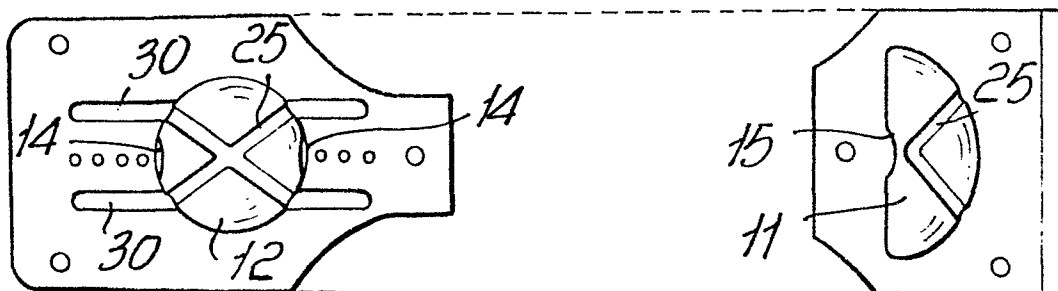
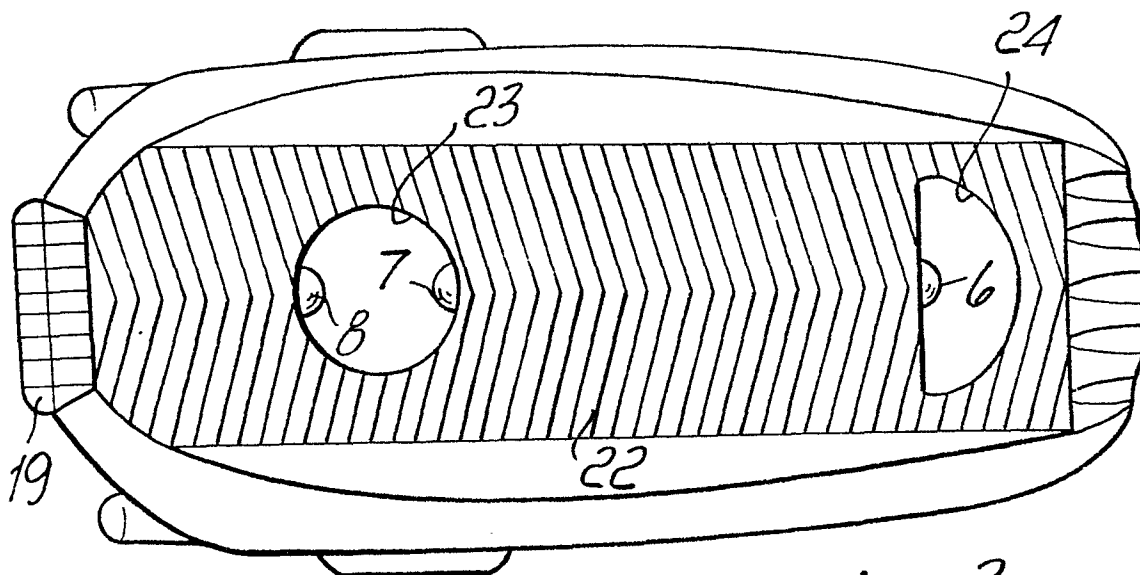
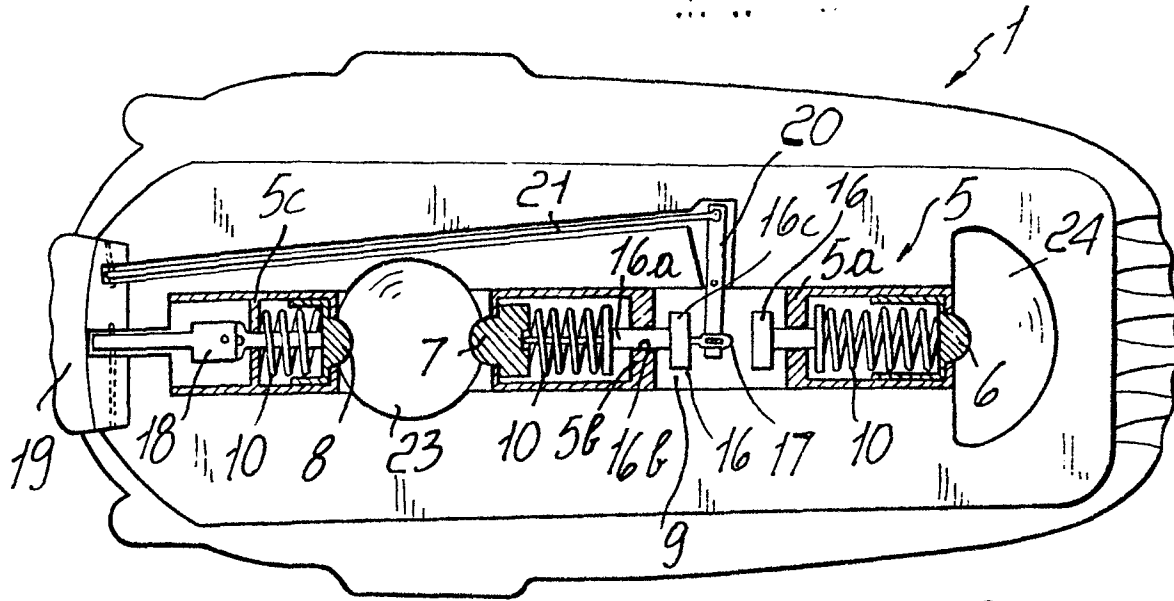


Fig. 1

**0183055**





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	DE-A-2 329 880 (GERTSCH A.G.)  * Page 2, paragraph 7 - page 3, paragraph 2; figures *	1-3,7, 8	A 63 C 9/086
A		6,10	
A	FR-A-2 091 429 (MARKER) * Page 11, line 35 - page 12, line 14; page 14, line 34 - page 15, line 37; figures 4,11-14 *	1-8,10	
A	FR-A-2 051 109 (WITTING) * Page 8, line 24 - page 9, line 17; figures 1-4C *	1,2,7, 8,11	
A	DE-A-2 162 336 (SPIELDIENER) * Page 4, paragraphs 2,3; page 6, paragraph 2; figures *	1,7,8	<div>TECHNICAL FIELDS SEARCHED (Int. Cl.4)</div> A 63 C A 45 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 07-03-1986	Examiner GERMANO A.G.
<div>CATEGORY OF CITED DOCUMENTS</div> <div> X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document </div> <div> T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding document </div>			