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Caporicci

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[54] **SKI BOOT**

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[52] **U.S. Cl.** ..... **36/2.5 AL**

[51] **Int. Cl.** **A43b**

[58] **Field of Search** ..... 36/2.5 R, 2.5 AL, 50

[56] **References Cited**

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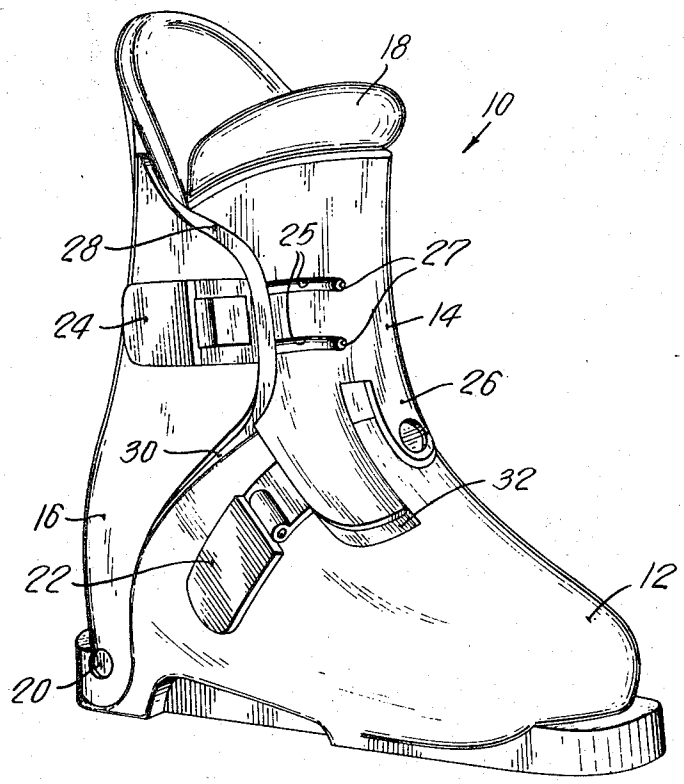
Primary Examiner—Patrick D. Lawson

Attorney, Agent, or Firm—Alan Swabey; Robert E. Mitchell

[57] **ABSTRACT**

This invention relates to a ski boot which is flexible in the area adjacent the instep of a wearer of the boot. The boot is made up in three sections; a back section, a bottom section, and a tongue section. To make the boot flexible, the mating edges of the tongue and back sections comprise portions which are U-shaped in cross section, and the legs of the U-shaped portions are interjoined. The top leg of the tongue section will comprise a part of the top surface of the boot. To interconnect the interjoined legs, a slidable fastener passes through openings in the legs of the tongue section and the leg of the bottom section which extends between the legs of the tongue section. The fastener consists of a cylindrical middle section with flanges at both ends. Each flange is seated in a recess of a respective tongue section leg. A spiral spring surrounds the cylinder, and the ends of the spring abut against protrusions on the opening in the leg of the bottom section which extends between the legs of the tongue section. When the foot is pivoted, the U-shaped portions will move relative to one another against the force of the spring to provide the required flexibility. When the foot is unpivoted, the spring will urge the U-shaped portions back into their original positions. The back section of the boot is made to be pivotable relative to the bottom section so that the back section will follow the back of the leg when the front part of the boot flexes. The pivoting action of the back section is provided by a pivot pin in the heel of the boot.

7 Claims, 8 Drawing Figures



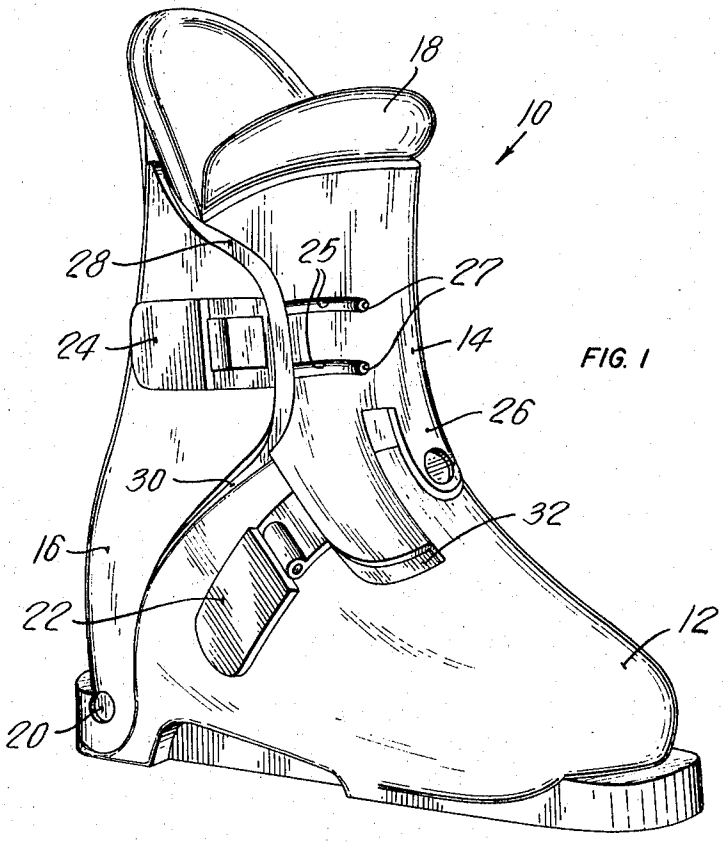

18
10
28
25
27
24
14
26
30
32
16
22
12
20

FIG. 1

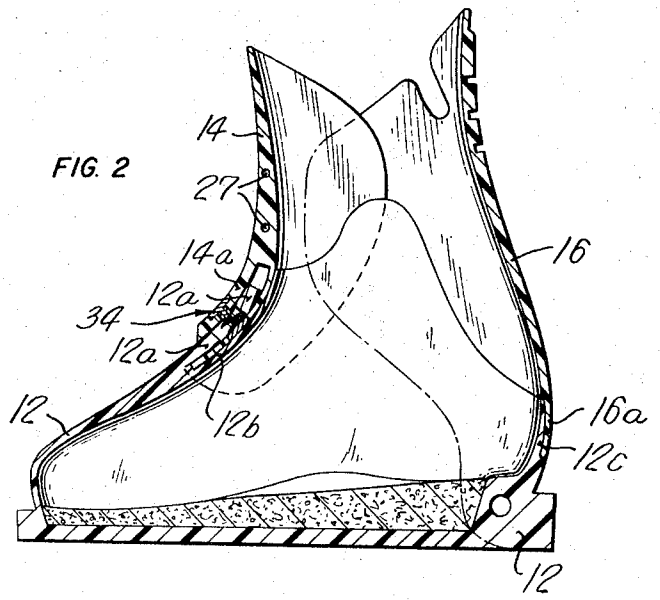
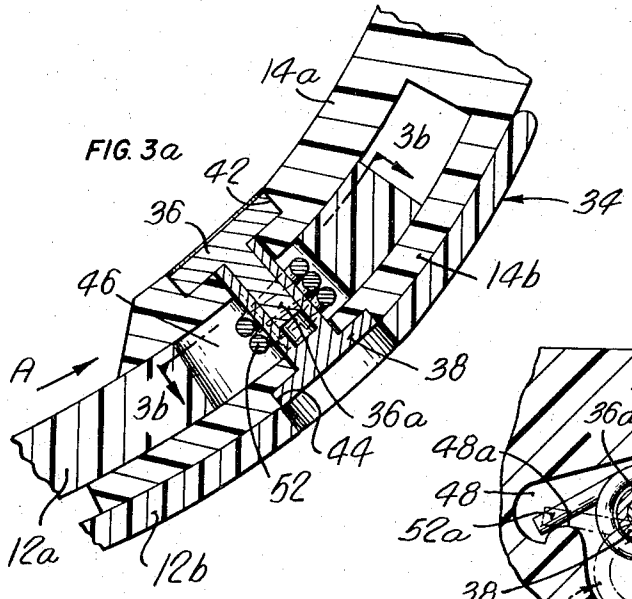

14
27
14a
12a
34
12a
12
12b
16
16a
12c
12

FIG. 2

FIG. 3a



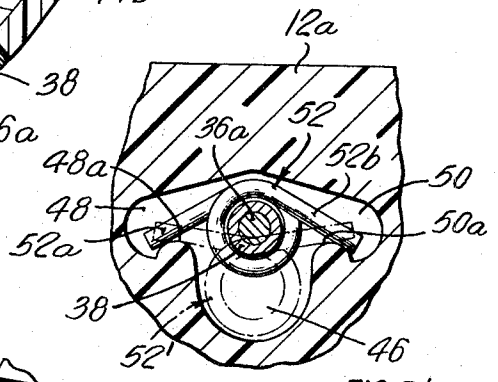
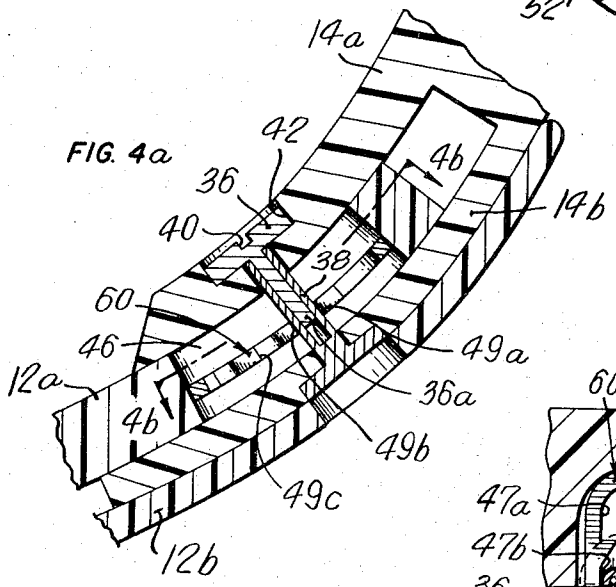


FIG. 3b

FIG. 4a



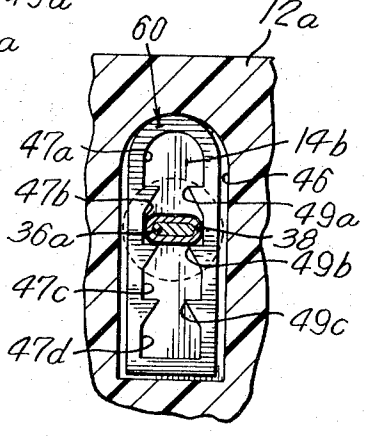


FIG. 4b

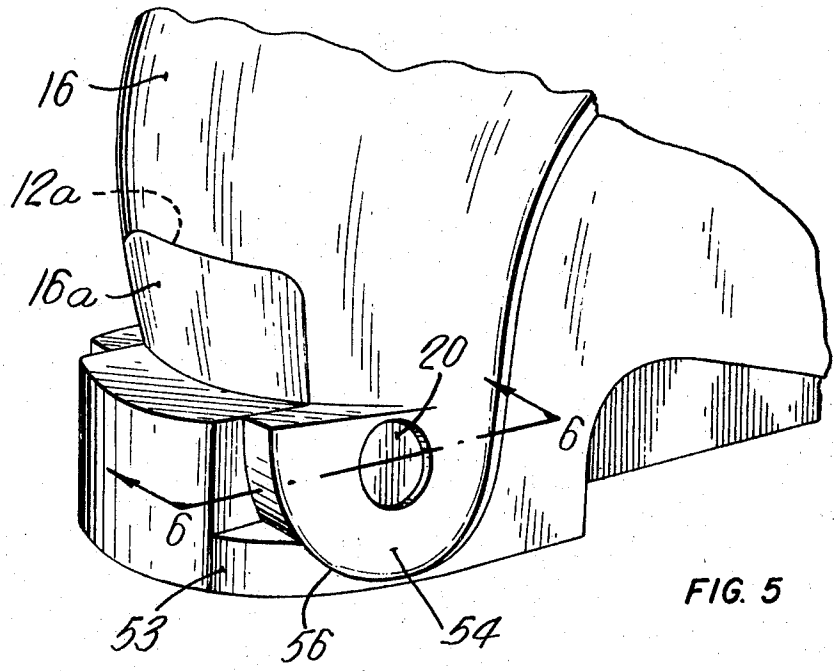


FIG. 5

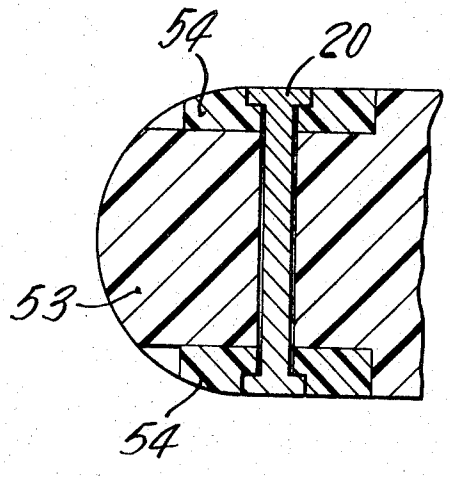


FIG. 6

SKI BOOT

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a novel structure for a ski boot. More specifically, this invention relates to a ski boot which is flexible in the area adjacent the instep of a wearer.

2. Description of the Prior Art

Although for most downhill skiing, a rigid inflexible boot was required, with present day approaches to skiing, and especially the approach where skiers mount a short rise for a jump, a boot which is flexible in that area of the boot adjacent the instep of a wearer of the boot, is desirable. To meet this requirement, boots are supplied which have elastic-like openings at the front of the boot. When a skier pivots his foot upward to mount the rise, the front of the boot stretches open so that the required flexiblity is provided.

However, with this type of boot, the back part of the boot will move away from the back of the leg when the skier's foot is pivoted so that a portion of the back of the leg is left unsupported. Further, the boots have to be adjusted as to the amount of flexibility available. If it is adjusted too flexible, then the remainder of the downhill run could be dangerous. If it is adjusted with little flexibility, then mounting the rises could be difficult.

STATEMENT OF THE INVENTION

In order to overcome the above, and other, disadvantages, a boot is provided with a wide range of flexibility in the front part of the boot adjacent to the instep of the wearer thereof, and the back of the boot is so constructed that it will follow the back of the leg when the skier pivots his foot.

In accordance with the invention, a ski boot comprises;

a bottom section;

a tongue section; and

a back section;

said tongue section comprising a portion which is U-shaped in cross section, at an edge of said tongue section;

said bottom section comprising a portion which is U-shaped in cross section, at an edge of said bottom section;

said U-shaped portion of said tongue section being interjoined with said U-shaped portion of said bottom section at a joint at the front part of the boot, said U-shaped portions being movable relative to one another at said joint;

whereby said boot is flexible at said joint.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood by an examination of the following description, together with the accompanying drawings, in which:

FIG. **1** is a side view of a boot constructed in accordance with the invention;

FIG. **2** is a side section of the boot to illustrate the various elements thereof;

FIGS. **3**, **3***a* and **4**, **4***a*, respectively, illustrate two different embodiments of the slidable insert arrangement of the invention; and

FIGS. **5** and **6** illustrate the pivoting arrangement at the back of the boot.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring now to FIG. **1**, the boot, indicated generally at **10**, comprises a bottom section **12**, a tongue section **14** and a back section **16**. The boot also includes a filling of foam rubber or like material **18**.

The back section is pivoted, at the bottom end thereof, by a pivot means **20** which will be more fully discussed below. The boot also includes buckle and strap arrangements **22** and **24** as is well known in the art. The buckle and strap arrangement **24**, when in the fastened condition, will provide a mechanical connection between the tongue section **14** and the back section **16**.

Preferably the straps **25**, which may be made of a flexible material such as flexible wire, pass through slots **27** in the front of the tongue section. The provision of slots here will provide added flexibility to the boots.

The tongue section includes a shock absorber or flexing means **26** which will be more fully discussed below. The tongue section further includes a recessed portion **28** adjacent the back section, and the bottom portion also includes a recessed portion **30** adjacent the back section. When in operation, the back section can slide into the recessed portions **28** and **30** to thereby follow the leg and provide full support even when the wearer's foot is pivoted. Similarly, the bottom section contains a recessed portion **32** adjacent the bottom edge of the tongue section into which the tongue section can slide when the front part of the boot is flexed.

Referring now to FIG. **2**, the boundary of the tongue section is shown in light dotted lines, the boundary of the bottom section is shown in heavy dotted lines, and the boundary of the back section if shown in dot and dash lines. In addition, the tongue section contains, at the bottom edge thereof, a U-shaped portion having legs **14***a* and **14***b*. Interjoined with the legs **14***a* and **14***b* are legs **12***a* and **12***b* of a U-shaped portion of the bottom section. A slidable insert and spring arrangement **34** interconnects the legs of the U-shaped portions.

At the back of the boot, overlying portion **16***a* of back section **16** overlaps underlying portion **12***c* of bottom section **12**. As can be seen, with this arrangement, when the back section of the boot moves upwardly, water or snow will not be able to enter into the boot because of this overlapping of the back and bottom portions.

One embodiment of the slidable insert arrangement is more fully shown in FIG. **3** in which FIG. **3***a* is a section and FIG. **3***b* is a top view.

Referring now to FIG. **3**, the slidable insert **36** comprises a fastener having a base or female part **38** and a top or male part **40**. The fastener is arranged so that the top part is held fast in the base. For example, the top part could be a screw like member, and the base part would include mating screw threads. The fastener is preferably generally cylindrical in shape.

The top part **40** has a flange which is seated in recess **42** of leg **14***a*, and the bottom part has a flange which is seated in recess **44** of leg **14***b*. The recesses **42** and **44** prevent motion of the fastener relative to the tongue section when the fastener is tightly fastened. The stem part of the fastener passes through the opening **46** of leg **12***a* a of the bottom section. The stem is encircled by a spring means **52** as seen in both FIGS. **3***a* and **3***b*.

Referring now to FIG. 3*b*, which illustrates one embodiment of the slidable insert, the opening **46** contains indentations **48** and **50** with spring retaining protrusions **48***a* and **50***a* respectively. The ends **52***a* and **52***b* abut with the protrusions **48***a* and **50***a* respectively so that the spring is retained in position by these protrusions.

FIG. **4** illustrates a second embodiment of the insert. In this embodiment, it is possible to restrain flexing of the boot is one position of the insert. The position of restraint is made adjustable.

In FIG. **4***b*, the opening **46** comprises a plurality of circular openings **47***a* to **47***d* and a plurality of elongated openings **49***a* to **49***c*. The insert **36** is elongated in cross section and contains a slot **37** in the top surface thereof. When the insert is in the position shown in solid lines in FIG. **4***b*, it will not be able to slide in the opening **46** so that the flexing of the boot is restrained. When **36** is turned through 90°, it will be able to move in the elongated openings **49** and the boot is flexible. As can be seen, the position of restraint is adjustable.

It will be appreciated that the diameter of the circular openings **47** will have to be greater than the length of **36,** and that the width of the elongated openings will have to be greater than the width of **36,** while the length of **36** will have to be greater than the width of the elongated openings.

In FIG. **4***a*, the relative positions of **47** and **49** are shown.

In operation, the slidable insert works as follows: When the foot of a boot wearer is unpivoted relative to the leg, the insert will not move because it is restrained by the action of the protrusions **48***a* and **50***a* on the ends **52***a* and **52***b* respectively of the spring member **52.** Thus, under these conditions, the boot will remain firm and supply the support needed in a ski boot.

However, when the foot is pivoted relative to the leg, the bottom section will tend to move relative to the tongue section and the force of the foot movement will be transferred to the bottom section of the boot. It will, of course, be appreciated that, in order for the relative movement to occur, for force will have to be great enough to overcome the retaining action of the spring **52.** Specifically, the bottom will tend to move in the direction of the arrow A in FIG. **3** relative to the tongue section. The opening **46** will move back so that the fastener will occupy the forward part of the opening **46** as shown in dotted lines in FIG. **4.** When the fastener is in this position, the spring, referenced **52'** in the forward position, will be under tension. Thus, the fastener will remain in this forward position only so long as the force urging it in the forward position is great enough to overcome the spring tension. As soon as the foot is pivoted back to its normal position, the forward urging force will be removed, and the tension in the spring will force the fastener back to its original position as shown in FIG. **3** and in solid lines in FIG. **4.** It can thus be seen that this arrangement permits the boot to be flexible to the degree required at any moment while still providing firm support when it is not flexed.

It will also be appreciated that, if the leg is pivoted relative to the foot, the same flexibility is provided. However, in this case, it is the tongue which moves relative to the bottom section.

In order to insure that the back section of the boot will provide support for the back of the leg when the front of the boot is flexed, the back section is adapted to pivot about the heel as is shown in FIG. **5.** In FIG. **5,** the heel **53** comprises a ball and socket like arrangement with arcuate member **54** in socket **56.** A pivoting pin **20** pivotingly connects the back section **16** to the bottom section **12** and provides the pivot point. The pin **20,** will, of course, go right through the heel as is shown in FIG. **6.** With this arrangement, the back section can pivot relative to the heel so that the back section can follow the back of a wearer's leg.

It can also be seen that the back section can pivot in the backward direction. The boot will be opened in this way when it is to be put on.

For a full description of the operation of the boot, reference is had once again to FIG. **1.** When the foot of a wearer is pivoted relative to his leg, as, for example, by lifting the toe in the upward direction, the boot will flex in the area **26,** as was explained with reference to FIG. **4.** When the boot flexes, the tongue section **14** will move downward, and the front edge of the tongue section will slide into recess **32** of the bottom section.

Because of the connection between tongue section **14** and back section **16,** through the buckle and strap arrangement **24,** the back section will be drawn forward, and the front edge of the back section will slide into recesses **28** and **30** of the tongue and bottom sections respectively. Thus, the back section will follow the back of the leg and provide support therefore at all times.

When the foot is unpivoted, the front of the boot will unflex as explained with reference to FIG. **4.** The back section will not be free to move back into its original position, and it will there be forced due to the back of the leg pushing against it.

Although a preferred embodiment was described, this was for the purpose of illustrating, but not limiting, the invention. Various modifications, which will come readily to the mind of one skilled in the art, are within the scope of the invention as defined in the appended claims. I claim:

1. A ski boot comprising;
a bottom section;
a tongue section; and
a back section;
said tongue section comprising a portion which is U-shaped in cross section, at an edge of said tongue section;
said bottom section comprising a portion which is U-shaped in cross section, at an edge of said bottom section;
said U-shaped portion of said tongue section being interjoined with said U-shaped portion of said bottom section at a joint at the front part of the boot, said U-shaped portions being movable relative to one another at said joint;
whereby said boot is flexible at said joint;
wherein the legs of the U-shaped portions are interconnected by a slidable fastener.

2. A ski boot as defined in claim **1** wherein the back section of the boot is pivotable relative to the bottom section thereof.

3. A ski boot as defined in claim **2** wherein a top leg of the U-shaped portion of said tongue section comprises a part of the top surface of the boot;
one leg of the U-shaped portion of said bottom section extending between the legs of the U-shaped portion of the tongue section;

said slidable fastener being mounted to slide on a surface of the other leg of the U-shaped portion of the bottom section.

4. A ski boot as defined in claim **3** wherein said fastener comprises a base member comprising a generally cylindrical upstanding part with a cavity in the interior thereof;

a flange member attached at one end of said upstanding cylindrical part, said flange being seated in a recess in the bottom leg of the U-shaped portion of the tongue section;

said upstanding cylindrical part passing through openings in both legs of the U-shaped portion of the tongue section and an opening in the one leg of the U-shaped portion of the bottom section;

said fastener further comprising a top member having a second flange member seated in a recess in the top leg of the U-shaped portion of the tongue section, and a projection extending from said second flange member and being retainably insertable into said cavity in said upstanding cylindrical part;

whereby the legs of said U-shaped portions are interconnected.

5. A ski boot as defined in claim **4** and further comprising a spiral spring member, having two ends, surrounding said upstanding cylindrical part;

said two ends of said spring member abutting protrusions in the opening in said one leg of said U-shaped portion of said bottom section.

6. A ski boot as defined in claim **2** wherein said bottom section comprises a heel at the back end thereof;

said heel having semi-circular socket-like openings at the both sides of the boot;

said back section comprising two mating semi-circular portions extending into said openings and being in slidable engagement with said openings;

and a pivoting pin extending through said mating portions and said heel;

whereby said back section is pivotable relative to said bottom section about the pivoting pin in said heel.

7. A ski boot as defined in claim **3** wherein said slidable fastener passes through openings in both legs of the U-shaped portion of the tongue section and an opening in the one leg of the U-shaped portion of the bottom section;

said openings comprising at least one circular opening and at least one elongated opening extending from said circular opening;

said slidable fastener being elongate in cross section, the length of the fastener being greater than the width of the elongated opening but less than the diameter of the circular opening, the width of the fastener being less than the width of the elongated opening;

whereby, when the fastener extends transversely to the elongated opening in the circular opening, it will be restrained from sliding, and, when the fastener extends parallel to the elongated opening, it will be permitted to slide.

* * * * *