

[54] SKI BOOT WITH LATCHABLE GUIDED HEEL HOLDER

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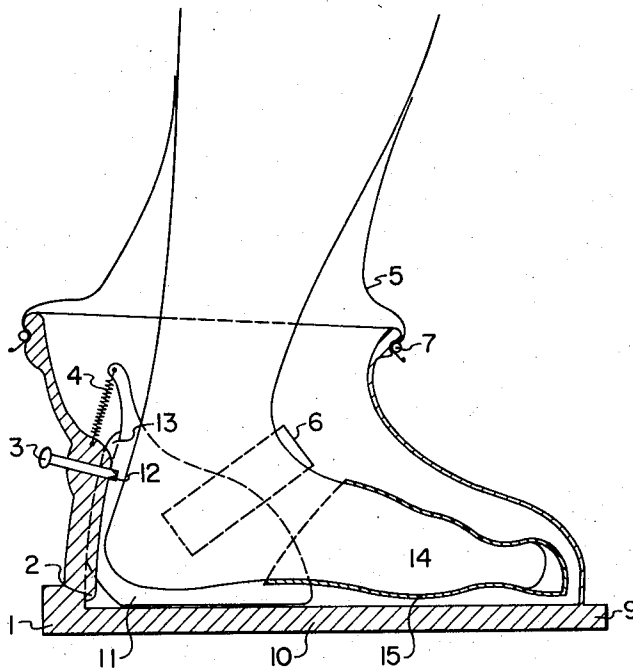
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ABSTRACT

A ski boot with a heel-holding shell that can be latched or unlatched to slide up and down in a guided path within the boot.

9 Claims, 1 Drawing Figure



SKI BOOT WITH LATCHABLE GUIDED HEEL HOLDER

CROSS REFERENCE

See the accompanying application entitled "Ski Boot with Latchable Articulated Leg Holder."

FIELD OF INVENTION

This invention deals with a ski boot adapted to facilitate a cross-country style of skiing using the skis and safety release bindings most commonly used for downhill skiing, giving the skier greater control and safety than the special cross-country skis, boots and bindings offer for downhill skiing.

BACKGROUND

Ski boots of the rigid type now commonly used for downhill skiing, with a rigid sole attached both front and back by safety release bindings to the ski, do not permit the heel to be raised for comfortable walking or horizontal skiing. Ski boots of the soft pliable type used for cross-country skiing generally are attached only at the toe end in order that the heel can be raised. These special boots cannot be used with the safety release bindings and skis commonly used for downhill skiing. The skier with special cross-country boots, bindings and skis cannot approach a downhill run with the same techniques as a skier with high-performance safety release bindings. Devastating consequences can follow when a skier attempts to turn his skis and finds that his heel has shifted to the side, leaving his foot pointed in a different direction than his ski.

It is evident that for good ski response to any slight motion of the skier's foot, the foot must not slide around in the boot and the boot must not move relative to the ski. For a skier to apply a horizontal turning torque to the ski, he must transmit two horizontal forces in opposite directions. For instance, to swing a ski to the right his heel must press to the left while the toe of the boot presses to the right.

It is an object of this invention to make a ski boot that permits the skier to raise his heel relative to his ski without sacrificing control for turning his ski.

It is a further object to make the type of skis and safety release bindings that are commonly used for downhill skiing more useful for cross-country skiing.

It is a further object to make a boot that is used for cross-country skiing also better suited for downhill skiing.

It is a further object to make a boot that will be inexpensive to manufacture and distribute.

It is a further object to make a boot that is easy to put on and take off, and more comfortable to wear.

DESCRIPTION OF THE INVENTION

In accordance with the present invention, there is provided a ski boot with a sole and an enlarged upper shell that can contain a guided heel-holding shell in addition to the skier's foot, wherein the heel-holding shell can be latched into a substantially fixed position or unlatched to permit the skier's heel to be raised or lowered relative to the sole.

FIG. 1 shows a sectional view of one example of such a ski boot. There is a sole 10 with an attached upper shell. A sliding heel-holding shell 11 has an adjustable strap 6 which is attached to both the left and right sides of the heel-holding shell. This strap can be fastened

over the skier's instep to hold the heel-holding shell firmly in place relative to the skier's foot. The heel-holding shell also has a guidance means, with matching projections such as 13 from the heel-holding shell, and grooves 2 in the upper shell which limit the motion of the heel-holding shell to the path so defined. A single "dove-tail" type of projection and matching groove can prevent the heel-holding shell from sliding forward or sideways, but additional matching projections and grooves on both the right and left sides of the heel-holding shell and upper are preferred. Preferably, the guidance path should follow the arc of a circle, where the center of the circle is the principal joint 14 in the ball of the foot.

The heel-holding shell can be latched down by a variety of means including a sliding pin 3 that fits into receiving hole 12. When the latch pin is disengaged, a spring 4 is a secondary constraint to keep the guidance means from becoming disengaged. A flexible member that resists elongation, like a cord, can serve the same purpose. When it is desired to take off the boot, the secondary constraint is disconnected at one end.

For purposes of keeping snow and cold air out of the boot, a flexible cover 5 can be attached to the boot by an elastic ring 7. The flexible cover can be an integral part of the ski pants or a special piece held by elastic or other means to the skier's leg.

The toe projection 9 and the heel projection 1 preferably are of the conventional type to fit conventional safety release bindings.

The boot as illustrated can be molded inexpensively in a single piece with an integral sole and a fixed opening large enough to receive the skier's foot. The outside of the heel-holding shell obviously must be engineered to conform to the guidance grooves in the boot, and the inside width of the heel-holding shell should be adjustable with padding to make a tight but comfortable fit to the skier's heel.

Means to transmit forces from the front of the skier's foot to the ski are not the subject of this patent; but obviously means must be provided. Conventional known means include fitted or foamed padding within a rigid upper, and buckles or laces on a more or less pliable upper.

A number of known ski boots utilize a soft inner boot within a fitted rigid boot, giving some extra advantage when the inner boot can be worn indoors. The heel-holding shell of the present invention similarly can be extended to become an inner boot with a flexible sole 15. If this is done, the present invention still differs from the known systems in that the known systems fit the outer shell tightly over the inner boot or, at a minimum, constrain the sole from moving, whereas in the present invention it is essential that some vertical motion be allowed.

Many variations and modifications not specifically illustrated are possible, but it is not intended that FIG. 1 or the foregoing disclosure should define the invention.

What is claimed is:

1. A ski boot including a sole, an upper shell, a guided heel-holding shell wherein the guidance means permits the heel to be raised relative to the sole but substantially prevents forward, backward, or sideways motion of the heel relative to the sole, means for latching the heel-holding shell in a substantially fixed posi-

tion relative to the sole, and means for unlatching the heel-holding shell.

2. A ski boot as in claim 1 where the heel-holding shell is part of an inner boot, this inner boot having a flexible sole under the ball of the foot, and the outer boot upper has inside dimensions large enough to allow the inner boot to rise in back, starting at the ball of the foot.

3. A ski boot as in claim 1 with secondary constraint means provided to limit the vertical motion of the heel-holding shell to a greater or lesser degree.

4. A ski boot as in claim 1 with a guidance means and a secondary constraint that permits the heel-holding shell to be raised four inches, or more or less, without becoming disengaged from the guidance means, and means for disengaging the secondary constraint when desired.

5. A ski boot as in claim 1 where the vertical motion of the heel-holding shell is constrained by elastic means requiring greater force for greater vertical motion.

6. A ski boot as in claim 1 where the upper shell has a fixed opening large enough to permit the skier to insert or withdraw his foot from the upper shell while the heel-holding shell is attached to his heel.

7. A ski boot as in claim 6 with a flexible cover having means to fit over the fixed opening and around the ski-

er's leg.

8. A ski boot as in claim 1 where the sole is adapted to the conventional safety release bindings such as are used for down-hill skiing.

9. A ski boot with a rigid sole and an enlarged upper shell attached to the sole, said upper shell having an opening large enough to permit the skier to insert or withdraw his foot, a sliding heel-holding shell with means of holding the skier's heel substantially fixed relative to this heel-holding shell, a guidance system with means to restrict the motion of the heel-holding shell to a vertical arc relative to the sole, the center of the circle defining this arc coinciding approximately with the principal joint in the ball of the skier's foot, a means to latch the heel-holding shell in a fixed position relative to the sole, a means to unlatch the heel-holding shell from its fixed position, secondary constraining means to keep the heel-holding shell attached to the guidance system, means of releasing the said secondary constraining means when it is desired to separate the heel-holding shell from the boot upper, suitable available means for preventing the ball of the skier's foot from excessively shifting sideways or vertically relative to the sole, and suitable available means for attaching the sole of the boot to the ski.

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