# United States Patent [19]

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[54] **SKIER S BRACE**


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[52] **U.S. Cl.** .....**36/1.5,** 36/2.5 AL, 2/22

[51] **Int. Cl.** .....**A43b 3/00,** A41d 13/00

[58] **Field of Search**.....2/22: 36/1.5, 2 R, 2.5 R, 2.5 AG, 36/2.5 G, 2.5 H, 1



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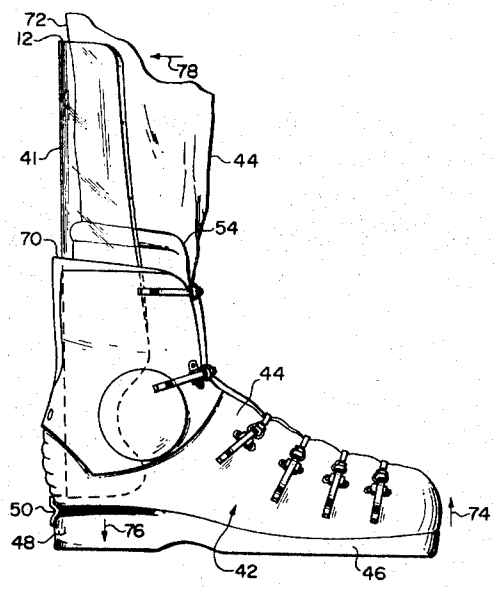
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[57] **ABSTRACT**

A simply constructed skiing aid device is disclosed comprising a molded form-fitting brace or insert which fits between the skier's foot and back part of the ski boot and extends upwardly to embrace the back or calf part of the legs. The device is contoured to fit the calf muscle comfortably and the lower portion is narrow to fit and move about the Achilles heel so that by leaning backward thereagainst the weight upon the front of the ski is lessened for better control of the tip of the ski in maneuvering and reduction of snow penetration.


**7 Claims, 4 Drawing Figures**



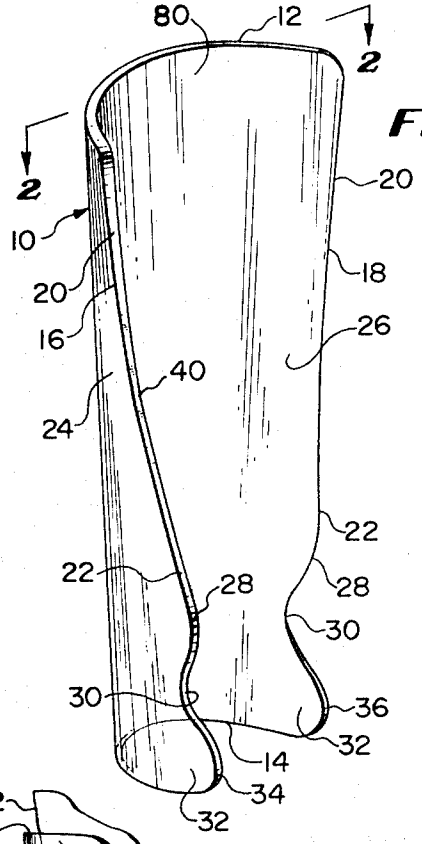



FIG. 1

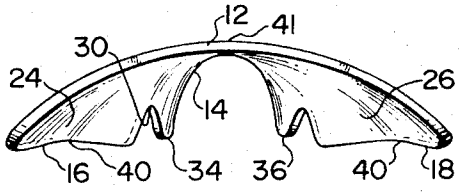



FIG. 2

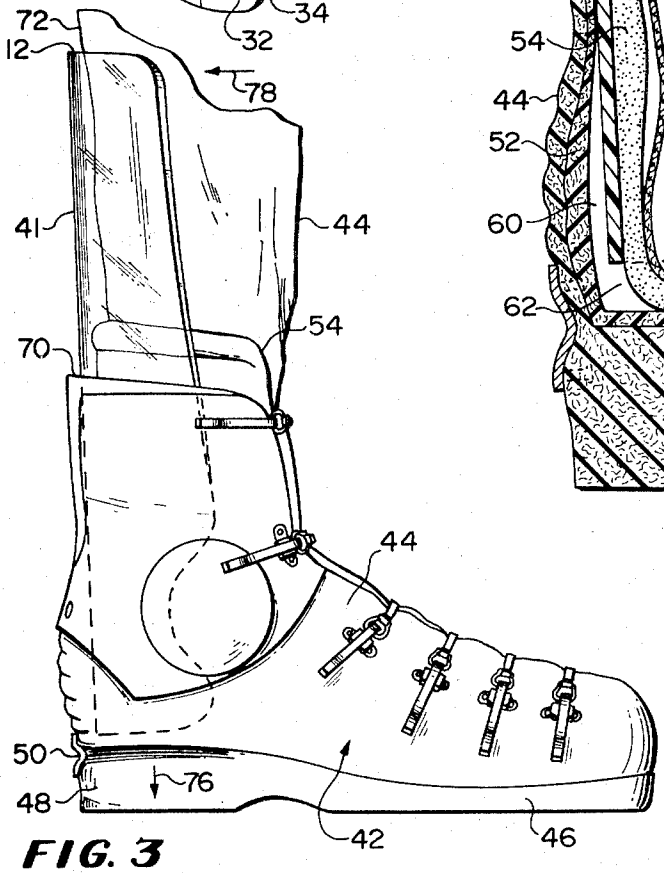



FIG. 3

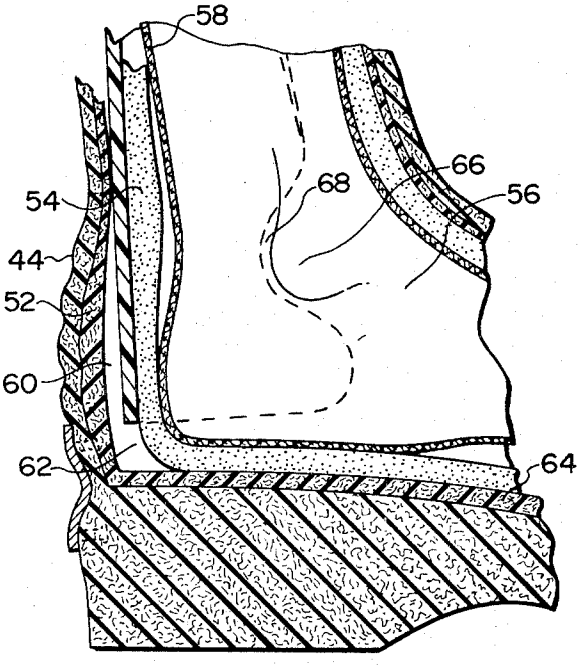



FIG. 4

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# SKIER S BRACE

## BACKGROUND OF THE INVENTION

In sport shoes such as skating shoes and the like, it is common to use a tendon guard which is a part of the shoe and extends upwardly a short distance at the back of the leg of the wearer. Such devices are not intended to cause any lifting of the front of the skate. Similar devices are used between the toe and instep of football shoes for place kickers. Some of these devices are mere extensions of the top leather portion of the shoe or boot. Ski boots are available with various types of stiffeners to keep the leather from wrinkling and also provide ankle support and protection. Other ski boots have inserts to support the front or shin portion of the wearer's leg.

## SUMMARY OF THE INVENTION

The invention concerns a device to be inserted into the back part of a ski boot to strengthen the region around the ankle without interferring with its flexure on a universal axis and also provide a lever whereby the skier can raise his toes and place his weight more on the heels and lift the front ends of either or both skis slightly for better control and balance.

## DESCRIPTION OF THE DRAWINGS

An embodiment of this invention is shown in the drawings wherein:

FIG. i is an isometric view of the device of this invention;

FIG. 2 is an edge plane view of the device as seen along lines 2—2 of FIG. 1;

FIG. 3 is a side of a ski boot on a wearer's foot showing the device of this invention inserted behind the foot within the boot and extending upwardly about the calf of the leg; and

FIG. 4 is a cross-sectional view taken along the lines 4—4 of FIG. 3.

## DESCRIPTION OF THE PREFERRED EMBODIMENT:

Referring to the drawings, FIG. 1 shows the device or brace **10** of this invention as it appears in the form of a molded, plastic piece having a curved top edge **12** and a curved bottom edge **14**. The top edge **12** is longer than the bottom edge **14** by a ratio of about 5 to 4. The curved edge **12** has a general radius about 2¼ inches while the bottom edge **14** has a general radius of about 1 4/16 inch in one embodiment. The bottom edge is generally elliptical in shape as shown in FIG. **2**. The total length is about **12** inches from the top edge **12** to the bottom edge **14** in the preferred embodiment. The opposing edges **16** and **18** are generally straight, though the plane surfaces thereof at the top portions **20** are not coplanar while the lower sections **22** are almost coplanar due to the gradually sharper curvature of the side walls **24** and **26** from top to bottom.

The edges **16** and **18** terminate in an inwardly curved portion **28** on each side which blends into the curved notches **30**, defining at the bottom the curved lobes **32** and **34**, and the rounded points or edges **34** and **36** extend outwardly to a position about in the plane of the edges **16** and **18**. As shown in FIG. **2** there is a slight break in the curved edges **16** and **18** as indicated at **40**.



FIG. **2** also emphasizes the differences in the curvatures at the top and bottom edges **12** and **14**. The back center line **41** is substantially straight from edge **12** to edge **14**.

Referring to FIG. **3**, the relative position of the device **10** to the ski boot **42** is shown, with the bottom portion thereof inside the boot and surrounding the Achilles heel of the wearer, whose leg is shown at **44**.

The boot **42**, which does not form a part of this invention, comprises the soft leather upper **44** and the heavy sole **46** having the heel portion **48** with the rear notch **50** to receive the ski clamp (not illustrated). The boot **42** has the internal stiffener **52** and a separable soft liner **54** which is formed of expanded plastic or similar material conforming to the shape of the wearer's foot which is indicated at **56**. The liner **54** is of known construction and is attached to the boot at selected points in a known manner. The layer **58** represents the heavy woolen sock worn by the user.

It is to be observed that the device of this invention fits down into the space **60** between the stiffener **52** and the liner **54** and is spaced as at **62** from the bottom or last portion **64** of the stiffener layer of the boot. In this position the ankle bone, indicated at **66**, is encompassed by and spaced from the curved notch **30** on each side of the foot **56**. This spacing is generally indicated at **68**.

The top edge **12** of the brace **10** extends above the top edge **70** of the boot **42** where it encompasses the calf **72** of the wearer's leg **44** and may or may not be spaced therefrom, depending on the attitude of the skier. An uplifting of the toes in the direction of the arrow **74** and resulting additional weight on the heel, as shown by the arrow **76**, due to leaning backward by the skier in the direction indicated by the arrow **78**, places the calf against the top inside portion **80** (FIG. **1**) of the brace **10** and raises the tip or toe end of the ski slightly. This lightens the load thereon so that the ski rides higher on the snow and planes over obstructions and can be steered more easily and with greater response and balance.

The skier's leg brace of this invention is formed of a single sheet of material such as plastic. The plastic sheet can be cut to the desired shape from a planar piece of plastic sheet and then drape molded over a heated rounded mold to the shape disclosed. All corner edges are rounded and smoothed as desired. A suitable rigid thermoplastic can be used for this purpose such as an acrylic resin. The ski brace can be used with any type of ski boot, but is preferably used with one having a separable lining behind which the lower portion is inserted.

It is apparent from the foregoing description that the leg brace can be formed in a single dimension or in different sizes to fit a number of skiers whether children or adults. Once in place, the leg brace is held by the encompassing shoe and the lacings thereof. Because of the manner in which the brace conforms with the heel portion of the wearer's foot, it remains in place during flexure of the skier's ankle without discomfort and gives the skier a feeling of being a part of his skis. The lobes **32** fit closely to the side of the skier's heel and the bottom edge **14** is carried in part by the rounded sides of the heel. A given size planar sheet of material can be molded to various curvatures to fit a number of leg

sizes. The length along the back surface **41** can be varied if desired. The presence of the soft layer **54** prevents any discomforture. The space **60** into which the brace is inserted will be larger than that indicated where the brace is inserted and smaller than that indicated when the shoe is laced. A tab, not illustrated, can be provided at the middle or back portion of the edge **14** to rest on the insole **64**, if desired, to maintain the space **62** during use. In general, the ratio of the radii of the top and bottom wall sections is about 1.8 to 1.0. The rounded notches **30** can be larger or smaller than that illustrated in relation to the other dimensions of the brace.

What is claimed is:

**1**. A skier's leg brace formed of sheet plastic material for insertion between the inner liner and counter of a ski boot behind the heel of the wearer comprising:

an elongated arcuate shaped walled body with a generally straight back surface, inwardly curved side walls and squared off top and bottom edges;

the top edge of said body having a greater radius of curvature than that of the bottom edge whereby the top portion is adapted to receive the calf of the leg of the wearer and the bottom portion is adapted to receive the back of the heel of the wearer; and

a rounded notch in edges of the side walls of said body spaced above the bottom edge adapted to border in spaced relationship about the ankle bones on each side of the wearer's foot.

**2**. A skier's leg brace in accordance with claim **1** in which:

the ratio of the radii of the top and bottom wall sections is about 1.8 to 1.0.

**3**. A skier's leg brace in accordance with claim **1** in which:

the top corners of the rounded notches are wider than the bottom corners thereof.

**4**. A skier's leg brace in accordance with claim **1** in which:

the top edge of said body defines an arcuate segment and the bottom edge defines a portion of an ellipse.

**5**. A skier's leg brace in accordance with claim **1** in which:

the side edges are bent inwardly to a substantially coplanar relation in the region of said rounded notches.

**6**. A skier's leg brace formed of stiff sheet material for insertion into the counter of a ski boot behind the heel of the wearer comprising:

an elongated arcuate walled body having a top curved section to encompass behind the calf of the leg of the wearer;

a bottom curved section of lesser radius than said top curved section to encompass behind the Achilles heel of the wearer;

said walled body having spaced generally straight side edges extending between the top and bottom edges thereof;

a rounded notch in each of said straight edges spaced from the bottom edge sufficiently to border in spaced relationship behind the curve of the ankle bone on each side of the wearer's foot within said boot; and

the bottom edge of said bottom curved section being spaced above the insole of said boot.

**7**. A skier's leg brace formed of sheet material for insertion between the inner liner and counter of a ski boot behind the heel of the wearer comprising:

an elongated arcuate shaped walled body with a generally straight back surface, inwardly curved side walls and transverse off top and bottom edges;

the top edge of said body having a greater radius of curvature than that of the bottom edge whereby the top portion is adapted to receive the calf of the leg of the wearer and the bottom portion is adapted to receive the back of the heel of the wearer;

a contoured edge in the side walls of said body spaced above the bottom edge adapted to border in spaced relationship about the ankle bones on each side of the wearer's foot; and

a tab member along the bottom edge engageable with the insole of a ski boot to limit the height thereof in relation to the leg of the wearer.

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