

[54] **CHILDREN'S SKI BOOT**

3,798,799 3/1974 Hanson et al. 36/2.5 AL

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[57] **ABSTRACT**

[21] Appl. No.: **493,504**

A ski boot comprising a semi-rigid outer shell having a rear opening and enclosing a removable resilient liner. The liner is provided with a tongue portion spanning the rear opening which can be pivoted through the rear opening of the boot to provide access to the interior. Closure of the rear opening compresses the shell against the liner sufficiently to form an effective seal against the entry of snow. The removable liner can be replaced to permit the use of a single shell with a range of foot sizes.

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

[51] **Int. Cl.** A43b 00/00

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

[56] **References Cited**

UNITED STATES PATENTS

3,228,122	1/1966	Ludwig.....	36/2.5 AL
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6 Claims, 5 Drawing Figures

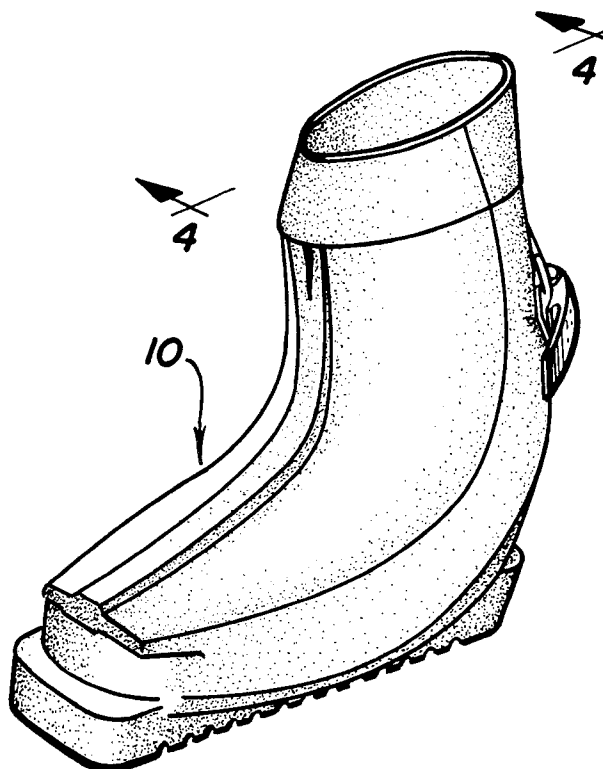


FIG. 1

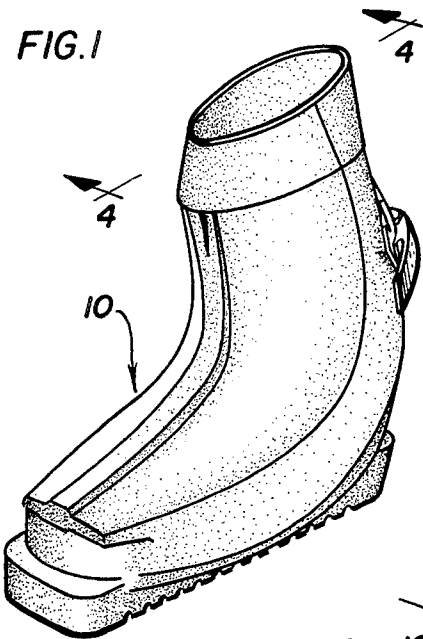


FIG. 3

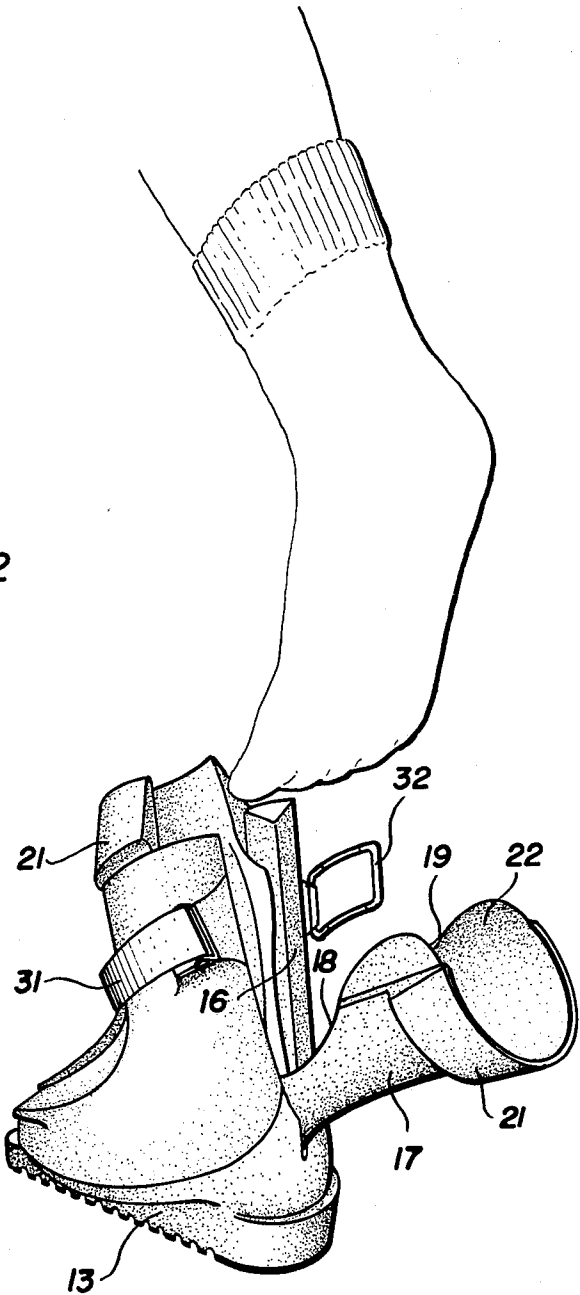


FIG. 2

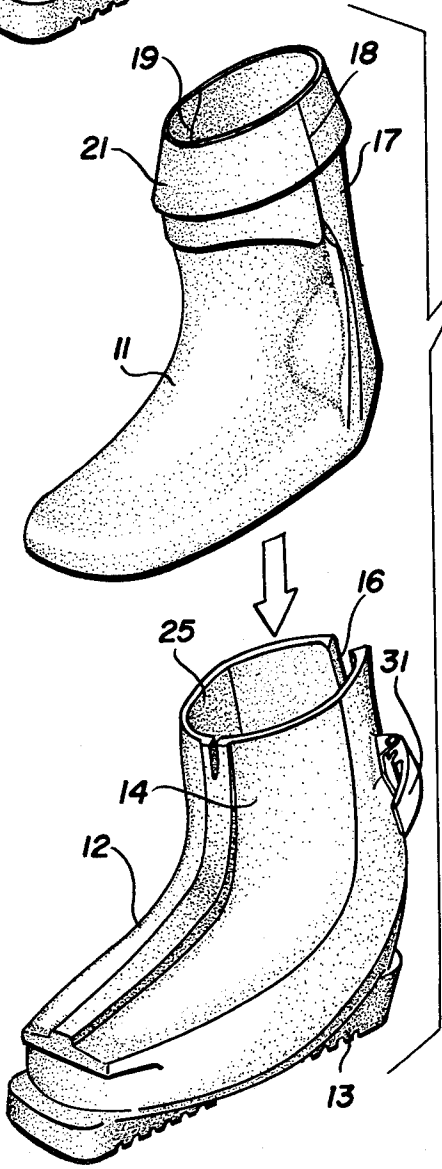


FIG. 4

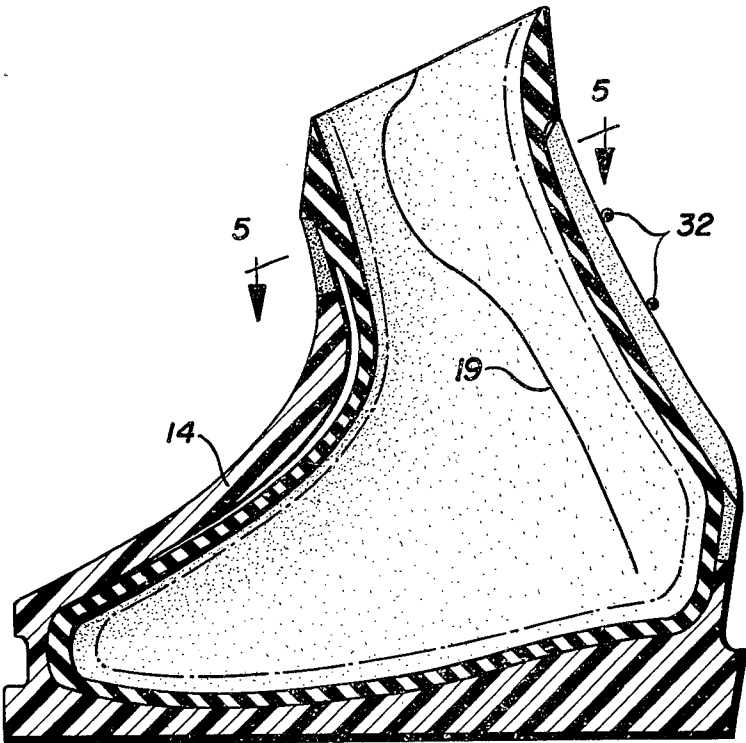
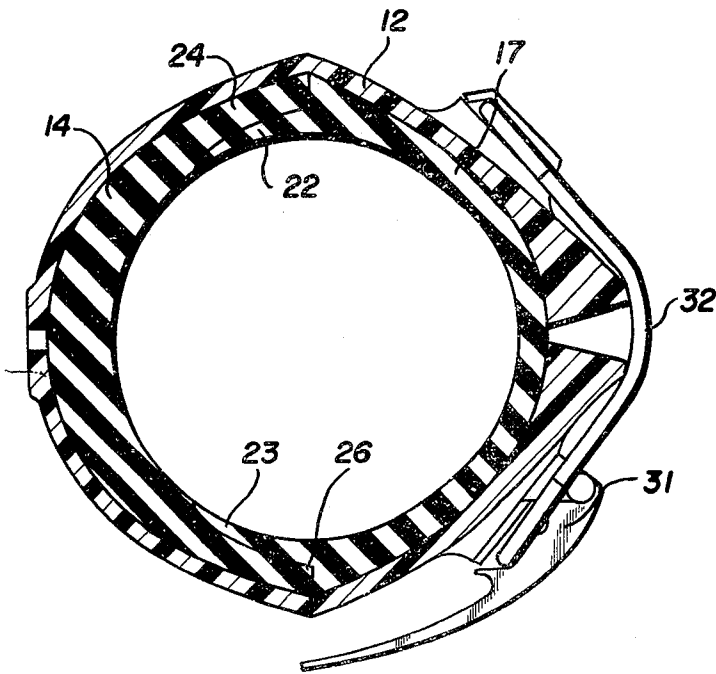


FIG. 5



CHILDREN'S SKI BOOT

This invention relates to an improved ski boot and more particularly to a ski boot comprising a semi-rigid outer shell with a removable resilient liner which cooperates with a rear opening in the boot to form a simple, relatively inexpensive, efficient seal against the entry of snow. The removable liner permits a single shell to be used to accommodate a number of different foot sizes, by appropriate selection of the liner. This feature, together with the simple closure, which permits the boot to be inexpensively produced, makes the boot of the invention particularly suitable for use by children during their growing years.

BACKGROUND OF THE INVENTION

It is well known that for proper control of the skis and for the comfort of the skier, the fit of ski boots is a matter of critical importance. For proper control, the shell of the boots must be relatively rigid in order to transmit the skier's leg movements to the edges of the skis. For the same reason, the skier's foot must be held firmly within the boot, particularly in the area of the ankle and instep. To meet these requirements, the fit of the skier's boots must be precise, so that if for any reason the size or shape of a skier's feet were to change significantly, the boots would no longer be suitable for use by that skier.

The requirement that the shell of the boot be made of a relatively rigid material has generally necessitated the use of relatively complex arrangements for providing an entry into the boot to permit a skier to insert his foot and thereafter to close the opening while maintaining a relatively rigid, nonyielding boot structure.

The above requirements have been met in the past by boots which, while achieving the desired objective, did so by means of designs which were complicated and hence expensive to manufacture. An additional expense was encountered in the case of children, whose feet grew substantially between skiing seasons, thereby requiring the purchase of a new pair of boots every year.

The present invention provides an improved ski boot of a design which provides a simple yet effective rear entry which can be closed to achieve the desired rigid structure while forming an effective seal against the entry of snow and which at the same time is adaptable for use with several different foot sizes, so that the same pair of boots can be used by a growing child over several skiing seasons with a minimum of expense.

The boot of the invention comprises a relatively rigid outer shell provided with a rear opening which in its preferred form comprises a vertical split in the vamp from the top thereof to a point near the attachment of the sole. Enclosed within the outer shell is a removable, resilient, one piece padding liner having an inner surface sized to fit the skier's foot and an outer surface which follows the contour of the inner surface of the shell. The liner is provided with a vertical tongue portion in the heel area which is joined to the liner in the vicinity of its sole. Because of the flexible nature of the liner material, the tongue portion can be pulled back through the split in the outer shell, which itself is sufficiently flexible to permit the entry of the skier's foot into the boot. After the foot is in place, the tongue portion is repositioned within the shell, and the rear entry is closed by a clamp or similar closure means which se-

cures the opposed edges of the split with sufficient force to form a seal between the abutting surfaces of the liner tongue and the outer shell.

DESCRIPTION OF THE DRAWINGS

The invention will be further described with reference to the accompanying drawings, in which:

FIG. 1 is an isometric view of a typical ski boot of the invention;

FIG. 2 is an isometric exploded view showing at the top the removable liner which is to be inserted within the semi-rigid shell disposed therebelow;

FIG. 3 is a perspective view of the rear portion of the boot with the liner in place, the tongue portion being pulled back preparatory to the insertion of a skier's foot;

FIG. 4 is a vertical sectional view along the line 4—4 through the boot shown in FIG. 1; and

FIG. 5 is a sectional view along the line 5—5 of FIG. 4.

DESCRIPTION OF A PREFERRED EMBODIMENT

As shown in the drawings, in a preferred embodiment the invention comprises a boot 10 consisting of a removable, resilient inner padding liner 11 and an outer semi-rigid shell 12, which includes a stiff sole 13 adapted to engage ski bindings and having integrally attached thereto a closed front vamp 14. As shown in FIGS. 2 and 3, the back of vamp 14 is provided with a vertical split 16 which extends from the top of a liner to a point near the attachment of the vamp 14 to sole 13. Vamp 14 is preferably made of a semi-rigid plastic material which provides adequate support for the skier's foot while being sufficiently deformable to permit entry of the skier's foot into the boot through the rear opening provided by split 16.

As shown in FIGS. 2 and 4, liner 11 has a general configuration approximating that of a sock, the inner contour of the liner following the surface of the skier's foot, and the outer surface of the liner having a contour to match that of the inner surface of outer shell 12. Liner 11 is formed of a material which is sufficiently resilient to provide firm support for the skier's foot yet sufficiently flexible to conform to the contours thereof so as to avoid localized pressure areas which might cause discomfort. Suitable materials for the construction of the liner will be apparent to those skilled in the art and include polyurethane elastomers, polybutadiene polymers, foam rubber, polyvinyl chloride, and the like.

Liner 11 is provided with a rear tongue portion 17 adapted to span split 16 in shell 12. The tongue portion is defined in part by side edges 18, 19 and at its bottom is joined integrally with the remainder of the liner in the vicinity of the sole thereof. Because liner 11 is formed of flexible material, tongue portion 17 can be bent or pivoted back through split 16 in shell 12 to the position shown in FIG. 3, whereby access to the interior of the boot is obtained.

At the top of liner 11 there is provided a cuff portion 21 which extends above and over the top edge 25 of shell 12 to cushion the wearer's leg against contact with the shell. It is preferred that in the vicinity of the cuff portion and for a short distance below, the mating edges 22, 24 and 23, 26 (FIG. 5) of tongue portion 17 and the remainder of liner 11 overlap, so as to provide an effective seal against the entry of moisture irrespec-

tive of minor variations in the size of the wearer's leg and/or the thickness of his clothing. While liner 11 alone can provide both a padding and a fitting function for the wearer's foot, the liner can also be provided with a cavity to be filled with a thermoplastic material for final fitting, as described in applicants' U.S. Pat. No. 3,798,799, issued Mar. 26, 1974.

The material of which the outer shell 12 is made should be sufficiently rigid to impart the desired rigidity to the composite boot assembly when in use. At the same time, the shell should be sufficiently deformable to permit separation of the edges of split 16 to permit withdrawal of the tongue portion 17 of the liner for insertion and removal of the skier's foot. For use in the invention, conventional ski boot shell materials can be used, such as polyurethane elastomers, fiber glass reinforced resins, including polyesters, epoxy resins, phenolics, and others which will be known to those skilled in the art.

The boot of the invention is provided with suitable clamping means for securing the edges of split 16 after the skier's foot is in position within the boot. A preferred clamp arrangement is shown in FIG. 3. A clamp member 31 is attached to one edge of split 16 and cable 32 is attached opposite clamp 31 on the other side of the split. As shown in FIG. 5, the adjacent edges 33, 34 of the split are thickened relative to the wall thickness of the remainder of the liner. Accordingly, when the clamp is closed, cable 32 produces an inward force on the edges of the split, causing the shell 12 to bear against the adjacent liner 11 with sufficient force to form a seal against the entry of snow during use of the boot.

Because liner 11 used in the boot of the invention is an integral unit, it can be designed to permit the use of a single shell with a range of foot sizes. Thus, for example, by increasing the thickness of the liner a relatively small foot can be properly fitted in a given shell. A liner having a thinner wall could then be used to fit the same shell to a larger foot and a still thinner liner would accommodate a still larger foot. In this way, a single shell could be used to accommodate a child's growing foot over a number of skiing seasons. Since the shell represents a major portion of the cost of the boots, the econ-

omy resulting from the reuse of the shell in this manner is obvious.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

What is claimed is:

1. A ski boot comprising a sole and a closed front semi-rigid vamp attached to said sole, said vamp having a rear opening through which a foot can be inserted; a removable inner resilient padding liner having an inner surface contoured substantially to the surface of a wearer's foot and an outer surface contoured to fit in said outer shell;

said liner having a tongue portion spanning said rear opening in said vamp and being adapted to be pivoted through said rear opening for permitting entry of a wearer's foot to the interior of said liner; and closure means for securing said rear opening in a closed position.

2. The ski boot of claim 1 wherein said rear opening is a vertical split extending from the top of said vamp to a point near said sole, the edges of said split being deformable sufficiently to create an opening for the insertion of a wearer's foot.

3. The ski boot of claim 2 in which the edges of said split are thickened and are forced by said closure means into contact with said liner to form a seal against the entry of snow into said boot through said rear opening.

4. The ski boot of claim 1 wherein the tongue portion of said liner extends vertically in the heel area of a wearer's foot and is pivotally joined to the remainder of said liner at a point near the sole of said boot, said tongue portion having a width greater than that of said rear opening in a closed position.

5. The boot of claim 3 in which said liner has a cuff portion attached to its upper edge, said cuff extending above and over the top edge of said shell.

6. The boot of claim 5 in which the abutting edges of said cuff attached to said tongue portion and to the remainder of said liner are tapered and overlap, thereby creating a seal against the entry of snow.

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