United States Patent

Dalebout

[15] **3,701,208**

[45] **Oct. 31, 1972**

[54] **SKI BOOT**

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[22] Filed: **July 16, 1970**

[21] Appl. No.: **55,435**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 726,094, May 2, 1968, Pat. No. 3,521,385, Continuation-in-part of Ser. No. 8,547, Feb. 4, 1970.

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

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

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

[56] **References Cited**

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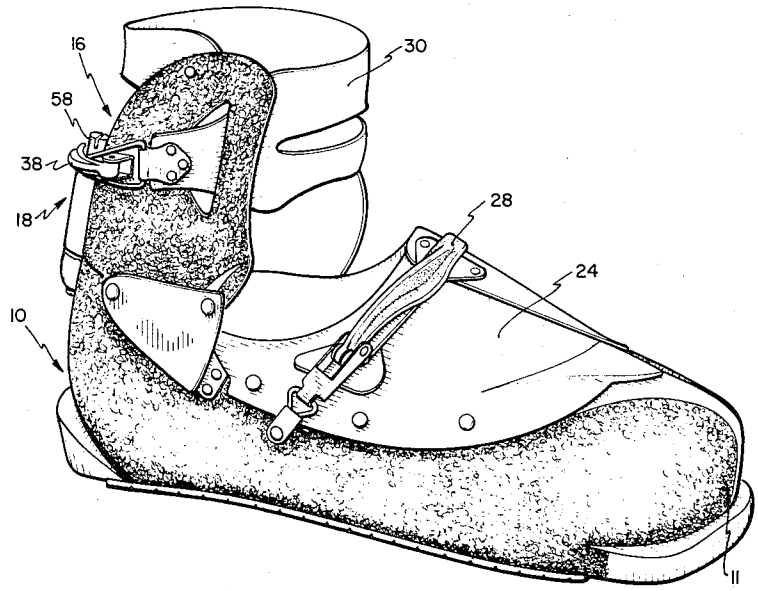
Primary Examiner—Patrick D. Lawson

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[57] **ABSTRACT**

A ski boot which includes a low cut rigid oxford type lower shell having spaced sidewalls affixed to a sole, a rigid ankle cuff having sidewalls connected together in a spaced relationship with a rear connecting wall and secured to the sidewalls of the lower boot wherein the ankle of the individual using the boot passes through the open front portion of the ankle cuff when the boot is placed onto and removed from the individual's foot, and strap means connected to the opposite sidewalls of the ankle cuff across its open front end for securing the individual's ankle within the cuff. The sidewalls of the ankle cuff can be connected to the lower boot to pivot back and forth thereon in a direction substantially parallel with the longitudinal axis of the boot and at the natural pivot point of the individual's ankle.

9 Claims, 14 Drawing Figures



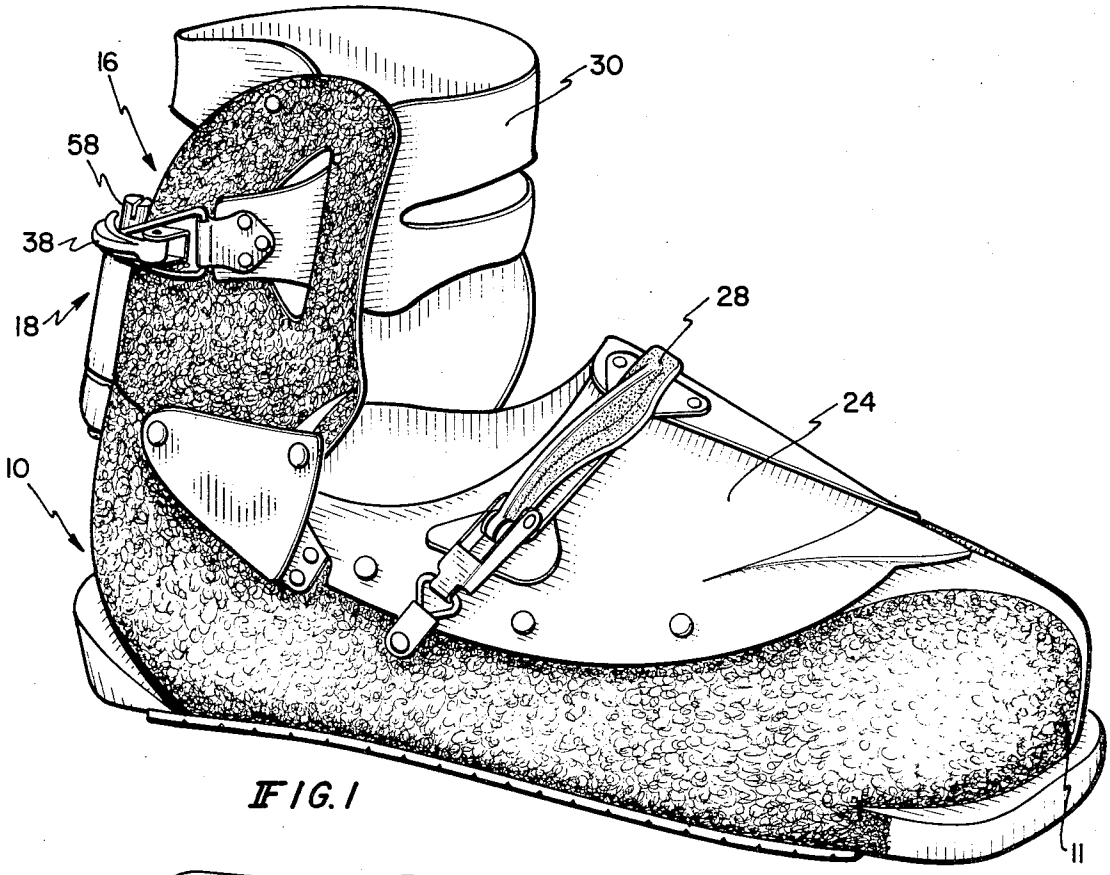


FIG. 1

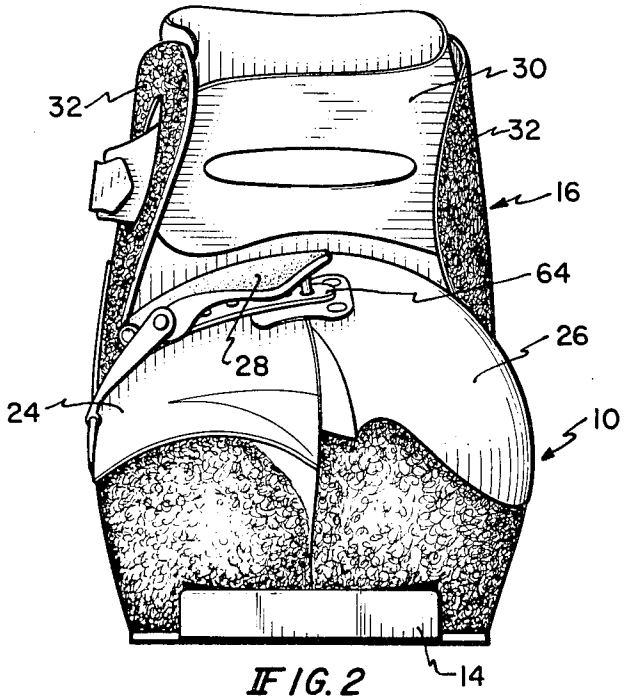


FIG. 2

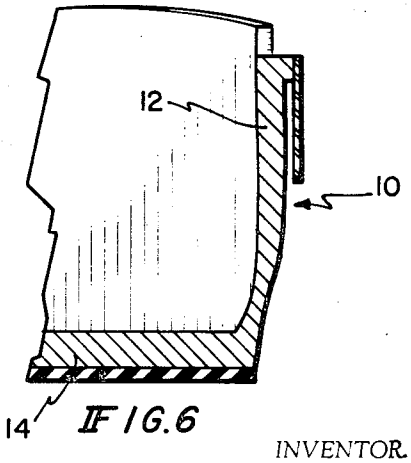


FIG. 6

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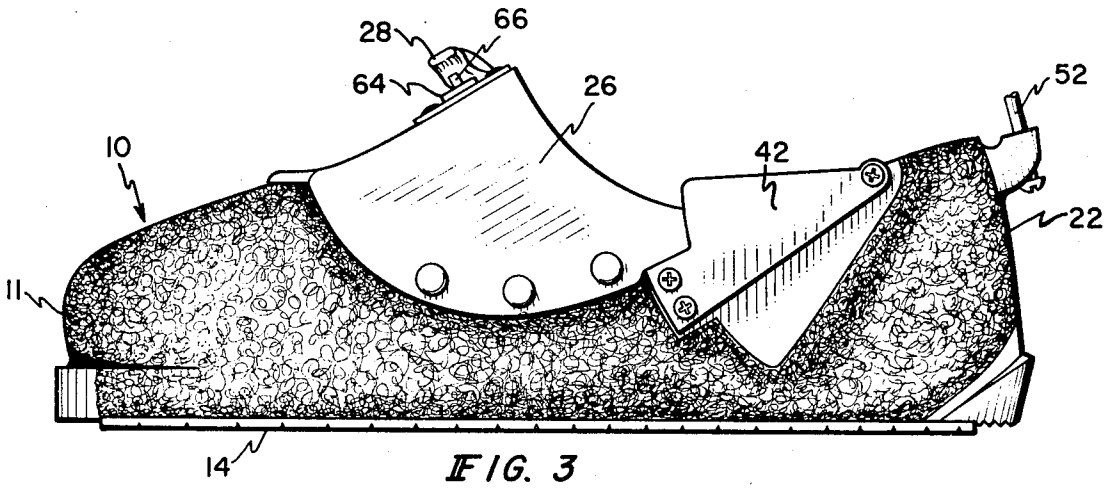


FIG. 3

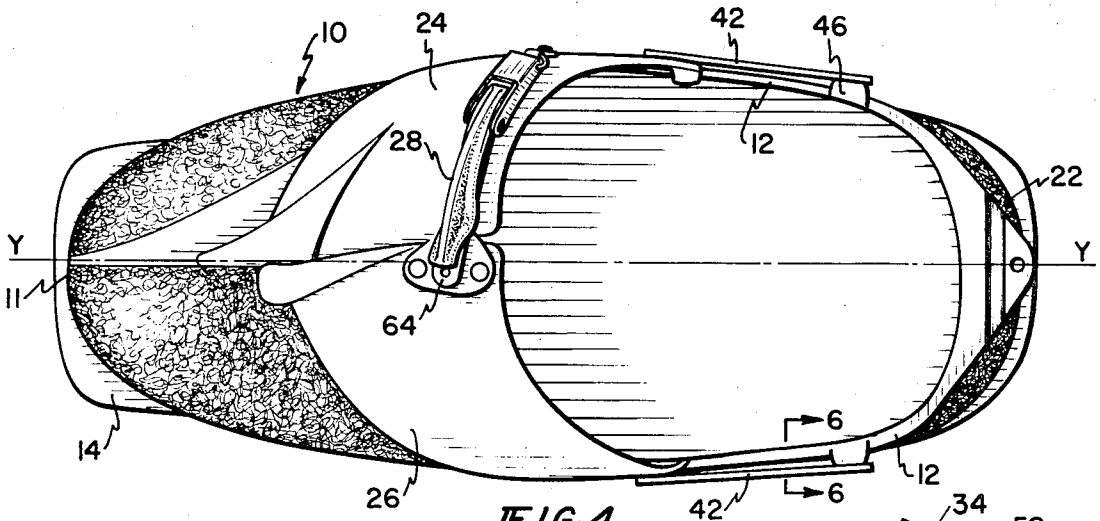


FIG. 4

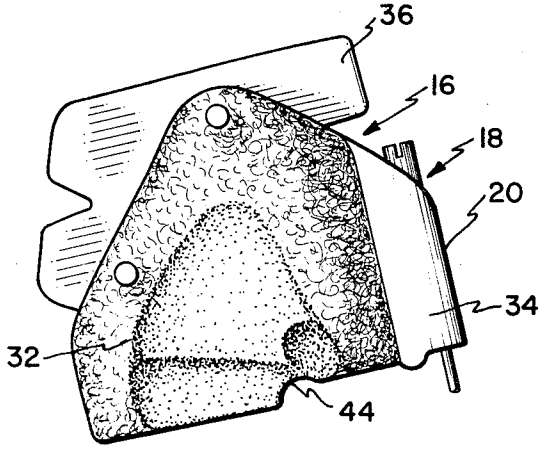


FIG. 5

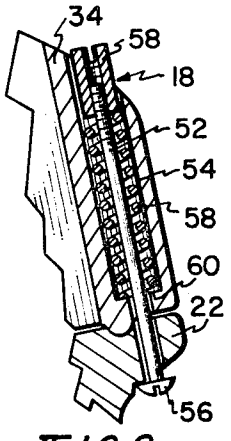


FIG. 8

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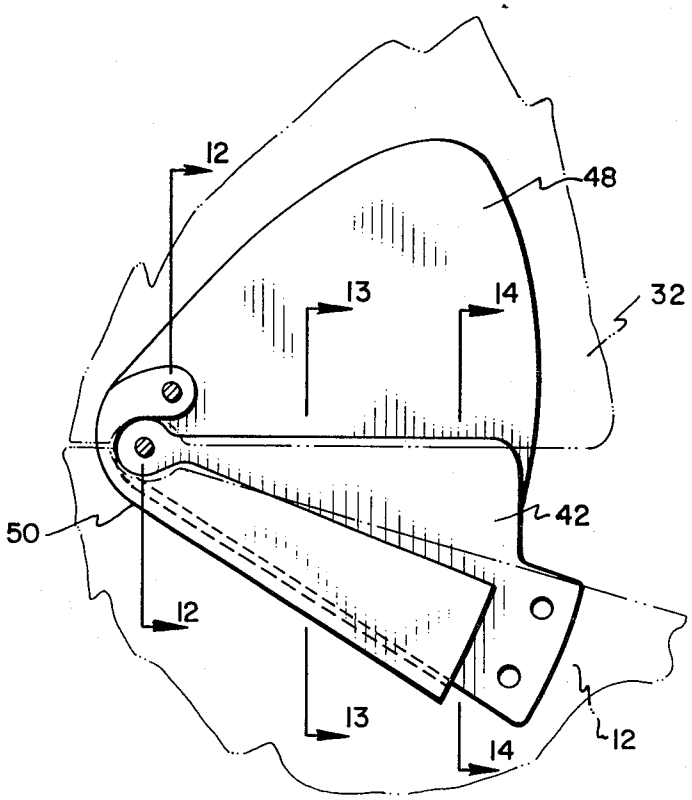


FIG. 7

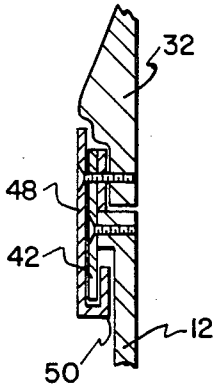


FIG. 12

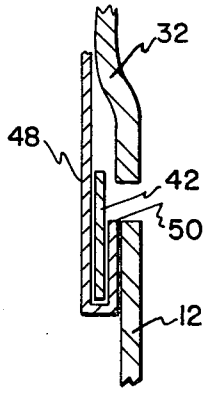


FIG. 13

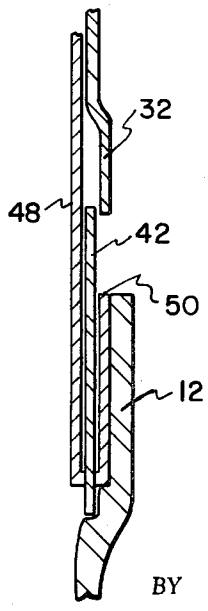


FIG. 14

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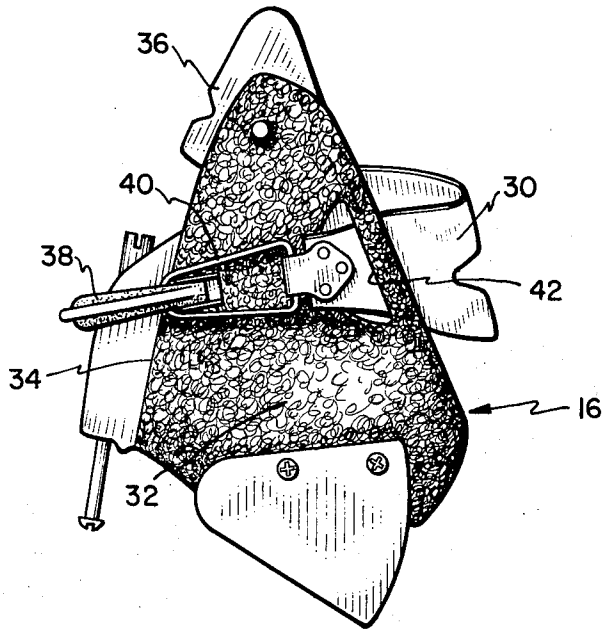


FIG. 9

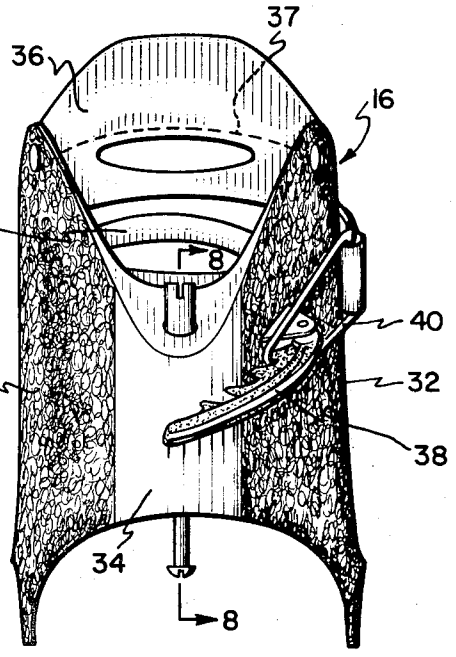


FIG. 10

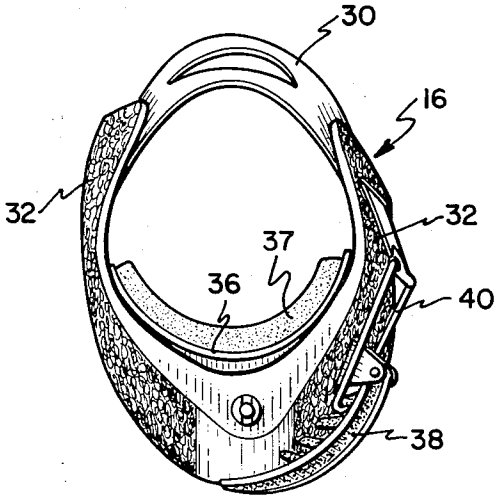


FIG. 11

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SKI BOOT

RELATED PATENT APPLICATIONS

This application is a continuation in part of my copending U.S. Pat. Application, Ser. No. 726,094, filed May 2, 1968, now U.S. Pat. No. 3,521,385 and my copending U.S. Pat. Application, Ser. No. 8,547, filed Feb. 4, 1970.

BACKGROUND OF THE INVENTION

A boot which is used for skiing is generally designed to support the user's foot and ankle against undesirable movement. To accomplish this the boot is generally constructed from a heavy leather or resin material. However, because of the boot's heavy construction some desirable foot movement is restricted. Attempts have been made to overcome this problem by constructing the boot with a pivotally mounted ankle cuff which allows its user to easily tilt his ankle forward and backwards. For example, in my U.S. Pat. No. 3,521,385, a ski boot is described which includes a low cut oxford type lower boot having an ankle cuff affixed thereon to pivot back and forth in a direction substantially parallel with the longitudinal axis of the lower boot. However, in order to obtain access to the boot the ankle cuff must be broken apart by releasing at least a portion of the pivoting structure from its connection to the lower boot. It is desirable to provide a rigid ski boot with a pivoted ankle cuff which does not require a portion of the cuff to be detached from its operative position when the boot is positioned on or removed from an individual's foot.

SUMMARY OF THE INVENTION

In its broadest form, the invention relates to a boot for supporting the foot and ankle of an individual which comprises a substantially rigid lower boot shell having first and second spaced sidewalls each connected to a boot sole; a substantially rigid ankle cuff having first and second sidewalls connected together in a fixed spaced relationship with a rear connecting wall, said first and second sidewalls of the ankle cuff being connected to the first and second sidewalls respectively of the lower boot shell such that the front portion of the ankle cuff is open to receive the ankle of said individual when the individual's foot is passed into and out of the lower boot shell; and strap means connected to the opposite sidewalls of the ankle cuff across the open front end of the cuff for securing the individual's ankle within the ankle cuff.

In a preferred embodiment of the invention, the sidewalls of the ankle cuff are connected to the sidewalls of the lower boot to pivot back and forth at the natural pivot point of the individual's ankle in a direction substantially parallel with the longitudinal axis of the lower boot shell.

In another embodiment of the invention biasing means are affixed to the rear connecting wall of the ankle cuff and to the heel end of the lower shell for urging the ankle cuff to a predetermined static position on the sidewalls of the lower boot.

In another embodiment of the invention the instep portion of the lower boot shell is open for placement of the foot therethrough.

In still another embodiment of the invention an inner boot is provided within the lower boot and the ankle cuff for retaining the individual's foot snugly therein.

In still yet another embodiment of the invention, flaps are secured on the lower shell for covering the open instep portion of the shell and for controlling the pressure of the inner boot on the individual's foot.

BRIEF DESCRIPTION OF THE DRAWINGS

So that the invention may be more readily understood and carried into effect, reference is made to the accompanying drawings which are offered by way of example only and are not to be taken as limiting the invention, the scope of which is defined by the appended claims which are intended to embrace equivalent structures.

FIG. **1** is a perspective view of the ski boot of the invention.

FIG. **2** is a front view of the ski boot showing the front retention strap in a closed position.

FIG. **3** is a plan elevation view of the low cut oxford type lower boot shell.

FIG. **4** is a top view of the lower boot shell.

FIG. **5** is a side view of the preferred ankle cuff of the invention.

FIG. **6** is a partial sectional view taken in the plane of line **6—6** of FIG. **4** looking in the direction of the arrows.

FIG. **7** is a plan elevation interior view of the preferred ankle cuff connecting means of the invention.

FIG. **8** is a sectional view taken along the plane of line **8—8** of FIG. **10** looking in the direction of the arrows and also a portion of a sectional view of the heel end of the lower shell.

FIG. **9** is a side view of a modified ankle cuff of the invention.

FIG. **10** is a rear view of the ankle cuff shown in FIG. **9**.

FIG. **11** is a top view of a modified ankle cuff.

FIG. **12** is a sectional view taken in the plane of line **12—12** of FIG. **7** looking in the direction of the arrows.

FIG. **13** is a sectional view taken in the plane of line **13—13** of FIG. **7** looking in the direction of the arrows.

FIG. **14** is a sectional view taken in the plane of line **14—14** of FIG. **7** looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings there is shown a ski boot which includes a low cut oxford type lower shell **10** having upwardly extending sidewalls **12** attached to the boot's bottom sole **14** and an upper shell in the form of an ankle cuff **16** sized to fit around and support the sides and rear portion of the ankle of an individual using the boot. The oxford shell **10** and ankle cuff **16** are constructed from a substantially rigid material such as metal, e.g., steel, aluminum, magnesium, etc., resin, fiber glass, etc. The ankle cuff **16** is preferably secured to the sidewalls of the oxford boot **10** with connecting means, hereinafter described, which allow the cuff to pivot back and forth on the top edge of lower shell sidewalls **12** in a direction substantially parallel with the longitudinal axis of said lower shell. In addition the ankle cuff preferably pivots at the

natural pivot point of the individual's ankle which is back and below the ankle bone protrusion of the foot. Biasing means **18**, also further described herein, are attached to the rear end **20** of the ankle cuff **16** and to the heel end **22** of the oxford shell **10** for urging the cuff to a predetermined static position on said shell **10**.

An inner boot of the type described in my co-pending application, Ser. No. 8,547, filed Feb. 4, 1970, is preferably positioned within the lower shell **10** and in the ankle cuff **16** for fitting the boot of this invention to the foot and ankle of an individual and for preventing water leakage between the lower shell and the ankle cuff. Flaps **24** and **26** with buckle connector **28**, and adjustable strap **30**, all hereinafter described, are used to secure the foot within the boot and to control the pressure of the inner boot on the individual foot.

In the drawings, FIGS. **1**, **2** and **5** illustrate one preferred from the ankle cuff **16** of this invention, and FIGS. **9**, **10** and **11** illustrate a modified form of the cuff particularly suited for racing purposes. As shown, the ankle cuff is a substantially rigid U-shaped member secured to the lower boot shell **10** such that the opening in the cuff is proximately facing the front toe **11** of lower shell **10**, and is sized to pass an individual's ankle therethrough when the boot is placed on and removed from said individual's foot. The encircling sidewalls **32** and rear connecting wall **34** of the ankle cuff are upwardly extending members used to support the ankle. The height of the side and rear walls **32** and **34** determines the amount of support obtained from the ankle cuff. For example, when the boot is used for racing purposes the sidewalls and rear wall can extend to a position proximate the lower calf of the individual's leg. This enables the skier to sit back on his skis while still being supported by the ankle cuff. Preferably, a rear support strap **36**, constructed from a material more flexible than the rigid ankle cuff material such as leather, rubber, a flexible resin, etc., is affixed to the opposite sidewalls **32** of the cuff **16** above rear wall **34** such that strap **36** contacts the skier's leg proximate his lower calf.

When an individual's foot and ankle are properly positioned within the boot's lower shell **10** and ankle cuff **16** the foot and ankle are secured within the boot with front strap **30** which is fixedly secured proximate one end to one of the cuff's sidewalls **32** and adjustably secured proximate its other end to the opposite sidewall of the cuff with suitable connecting means such as buckle **38** which coacts with a retention loop **40** secured to the free end of said strap **30**. Preferably, front strap **30** is constructed from a flexible material similar to rear strap **36** so that it can be easily swung away from the front opening of the ankle cuff **16**. As best shown in FIGS. **1** and **9**, a port **42** is preferably provided in the cuff sidewall **32** to which buckle **38** is connected which is sized to receive the free end of strap **30** so that the said strap can be tightened across the open interior of ankle cuff **16**.

As indicated, it is preferred that the ankle cuff be connected to lower boot shell **10** so that said cuff will pivot or rock back and forth on the lower shell in a direction substantially parallel with the longitudinal axis Y—Y of the shell. While any type of pivot connection means can be used for this purpose, it is preferred to use connection means which minimize lateral cuff movement as it pivots back and forth on the lower shell. One structure particularly suited for accomplishing this purpose is best illustrated in FIGS. **7**, **12**, **13** and **14**. As shown, a mating flange **42** is secured to sidewall **12** of lower shell **10** at a position spaced apart therefrom a sufficient distance to receive the locking end **50** of mating flange **48** which in turn is attached to cuff sidewall **32** to mate with the outside face of flange **42**. Cuff sidewall **32** is shaped to receive flange **42** between it and flange **48**. Each of the top edges of the lower shell's sidewalls **12** have an integrally formed pin **46** that acts as the pivot point of the cuff **16** on lower shell **10**. Pin **46** is positioned so that the pivoting movement of cuff **16** approximates the natural pivoting movement of the ankle, i.e., the pivot point of the ankle which is back and below the ankle bone protrusion of the individual's foot. A detent opening **44** is formed in the bottom edge of cuff sidewall **32** to ride on pin **46** and hold cuff **16** in a longitudinally fixed position on lower shell **10**. Accordingly, the lower edge of cuff **16** is supported on each of the pins **46** as it rocks back and forth thereon and lateral movement is prevented by the coaction between flanges **42**, flanges **48**, locking ends **50**, cuff sidewalls **32**, and lower shell sidewalls **12**. It is to be noted that the connecting structure herein described equally prevents lateral ankle cuff movement at any cuff angle with respect to lower shell **10** because of mating flange construction of the structure. In actual operation, as shown in FIGS. **7**, **12**, **13** and **14**, flanges **42** are connected to lower shell sidewalls **12** and mate with the inside faces flanges **48**, connected to ankle cuff sidewalls **32**, and also with the outside faces of said sidewall **32**. Additionally, locking ends **50** of flanges **48** mate with the inside faces of flanges **42** and the outside faces of sidewalls **12**.

Preferably, the ankle cuff **16** is held in a predetermined upright position on lower shell **10** except when a pivoting force is applied to the cuff by the skier by bending his ankles forward. For this reason the end wall **34** of the cuff **16** is connected with biasing means to the lower shell's heel end **22**. As shown in FIG. **8**, threaded rod **52** is spring loaded in housing **54** for this purpose. An enlarged head end **56** is connected to one end of rod **52** to coact with the heel end **22** of lower shell **10**. A nut **58** is attached to the opposite end of said rod **52** for adjusting the pressure on spring **58** which coacts between said nut **58** and a lip **60** formed at the bottom end of housing **54**. When the cuff is pivoted forward spring **58** is compressed which urges the cuff back to its normal upright position when the pivoting force is withdrawn. The force required to pivot the cuff can, as indicated, be modified by adjusting the position of nut **58** on rod **52**.

Flexible flaps **24** and **26** are secured to the sidewalls of lower shell **10** which cover the instep portion of the shell so that access can be obtained to the interior of lower boot **10**. The flaps overlap each other and are interconnected together with buckle **28**, connected to flap **24**, and loop connector **64** which coacts with pin **66** attached to flap **26**. In addition to allowing access to the interior of the boot, flaps **24** and **26** are used to adjust the pressure of the inner boot on the instep portion of the foot. Preferably, flaps **24** and **26** are constructed from a flexible material such as leather, rubber, plastic, or the like.

The boot of this invention is fitted to an individual's foot by first releasing buckle **38** so that the strap **30** can be pulled away from the ankle cuff's open front end and buckle **28** so that flaps **24** and **26** can be opened. An inner boot of the type herein described is positioned within the lower shell **10** and ankle cuff **16** and the person being fitted places his foot within the inner boot. When thus positioned, strap **30** is wrapped around the front portion of the individual's ankle, passed through port **32**, and fixedly secured with buckle **38** so that a desired pressure is applied to the individual's ankle. Finally, flaps **24** and **26** are secured together with buckle **28** as herein described.

What is claimed is:

1. A boot for supporting the foot and ankle of an individual which comprises:

a substantially rigid lower boot shell having first and second spaced sidewalls each connected to a boot sole;

a substantially rigid ankle cuff having corresponding first and second sidewalls fixedly connected together in a spaced relationship with a rear connecting wall and pivotally connected to the first and second sidewalls, respectively, of said lower boot shell by means including at least one boot flange connected to each of the said sidewalls of said lower boot shell and at least one cuff flange connected to each of the said sidewalls of the said ankle cuff to mate with one face of the corresponding boot flange, each of the named cuff flanges including a locking end which mates with the face of the corresponding boot flange opposite the said one face.

2. The boot of claim **1** wherein the lower edge of each of the sidewalls of said ankle cuff pivots back and forth at a predetermined fixed pivot point on the upper edge of the sidewalls of said lower boot shell.

3. The boot of claim **2** wherein said fixed pivot point is positioned at the natural pivot point of said individual's ankle.

4. A boot for supporting the foot and ankle of an individual which comprises:

a substantially rigid lower boot shell having first and second spaced sidewalls each connected to a boot sole;

a substantially rigid ankle cuff having corresponding first and second sidewalls fixedly connected together in a spaced relationship with a rear connecting wall and pivotally connected to the first and second sidewalls respectively of said lower boot shell such that said individual's ankle passes through the open front portion of said ankle cuff when the boot is placed onto and removed from said individual's foot; and

an elongated flexible strap fixedly connected at one end to one of said sidewalls of said ankle cuff and adjustably connected through an opening in the opposite sidewall of said ankle cuff to said opposite sidewall for securing said individual's ankle within said ankle cuff.

5. The boot of claim **4** wherein the sidewalls of said ankle cuff extend upwardly to a position proximate the lower calf of the individual's leg and rear support means are connected to said sidewalls of said ankle cuff proximate the lower calf of said individual's leg for supporting said leg.

6. The boot of claim **4** wherein biasing means are affixed to the rear connecting wall of said ankle cuff and to the heel end of said lower boot shell for urging said ankle cuff to a predetermined position on said lower boot shell.

7. In a boot for supporting the foot and ankle of an individual, including a lower boot shell having first and second spaced sidewalls and an ankle cuff having corresponding first and second sidewalls, the improvement comprising means including at least one boot flange connected to each of the said sidewalls of said lower boot shell and at least one cuff flange connected to each of the said sidewalls of the said ankle cuff to mate with one face of the corresponding boot flange, each of the named cuff flanges including a locking end which mates with the face of the corresponding boot flange opposite the said one face.

8. The improvement of claim **7**, wherein the lower edge of each of the sidewalls of said ankle cuff pivots back and forth at a predetermined fixed point on the upper edge of the corresponding sidewall of said lower boot shell.

9. The boot of claim **8** wherein said fixed pivot point is positioned at the natural pivot point of said individual's ankle.

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