

- [54] **SKI BOOT WITH CANTABLE UPPER**
[75] Inventor: **Charles S. French**, Sun Valley, Idaho
[73] Assignee: **Scott USA**, Sun Valley, Idaho
[22] Filed: **May 15, 1974**
[21] Appl. No.: **470,208**

- [52] U.S. Cl. 36/2.5 AL
[51] Int. Cl. A43b 00/00
[58] Field of Search..... 36/2.5 R, 2.5 AL

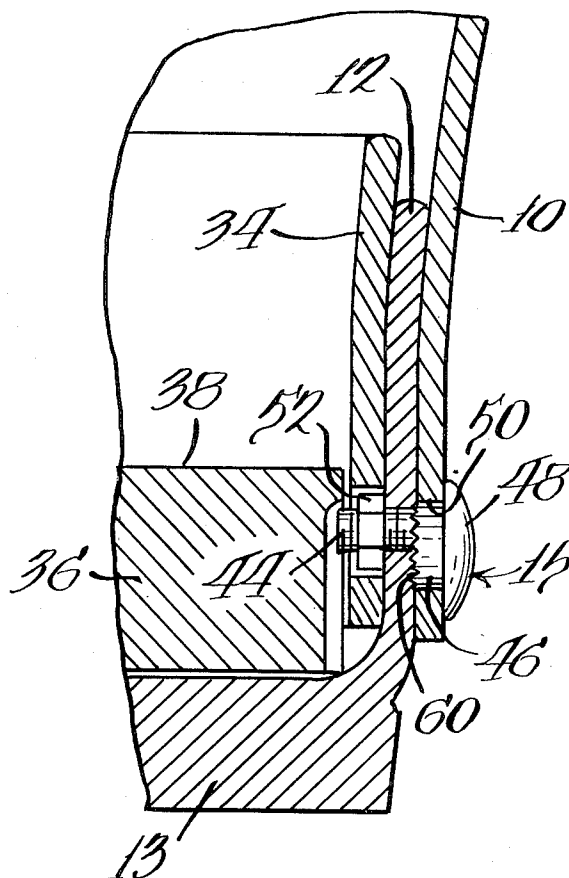
- [56] **References Cited**
UNITED STATES PATENTS
3,067,531 12/1962 Scott et al. 36/2.5 AL
3,545,103 12/1970 Bloomfield et al. 36/2.5 AL
3,721,023 3/1973 Kastinger..... 36/2.5 AL

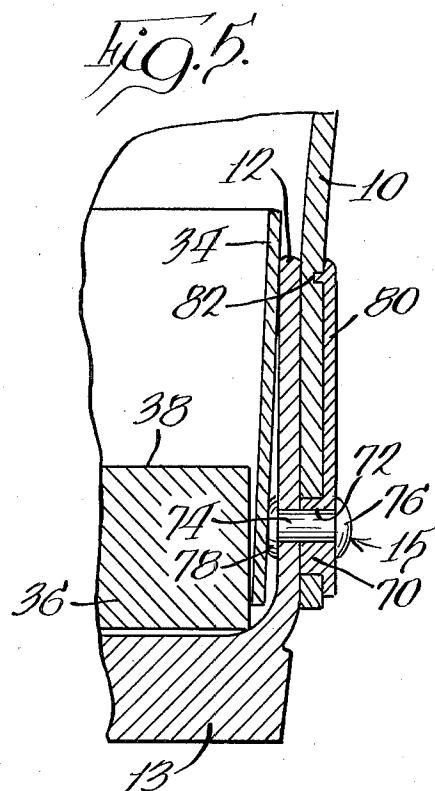
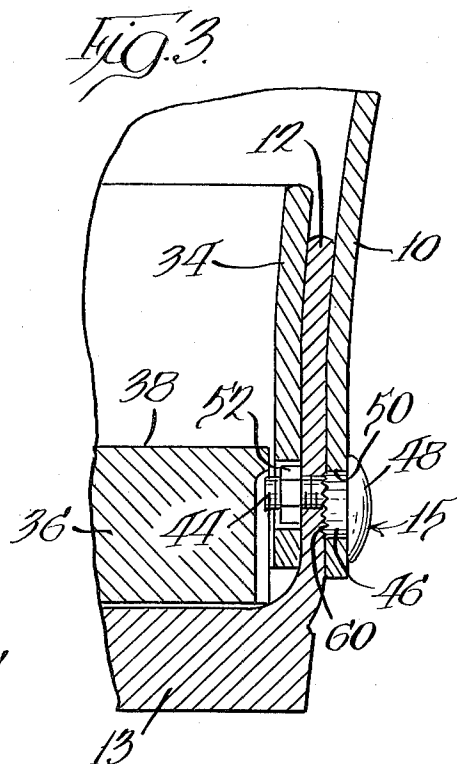
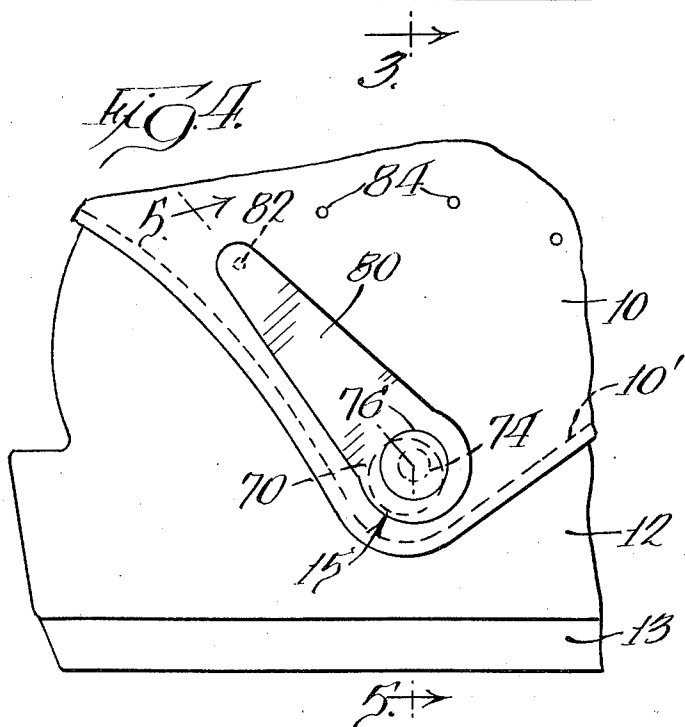
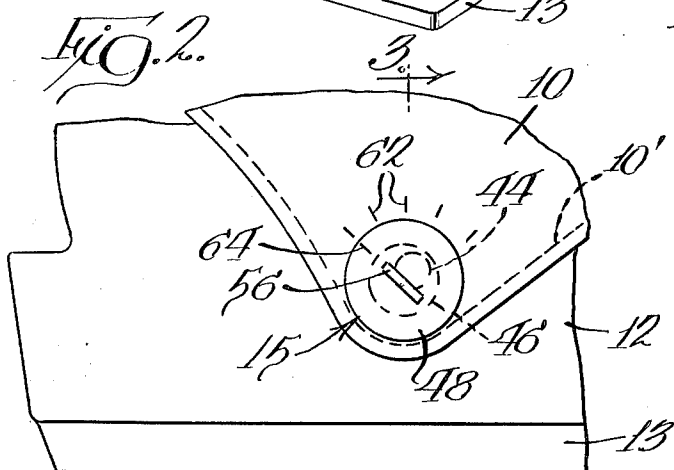
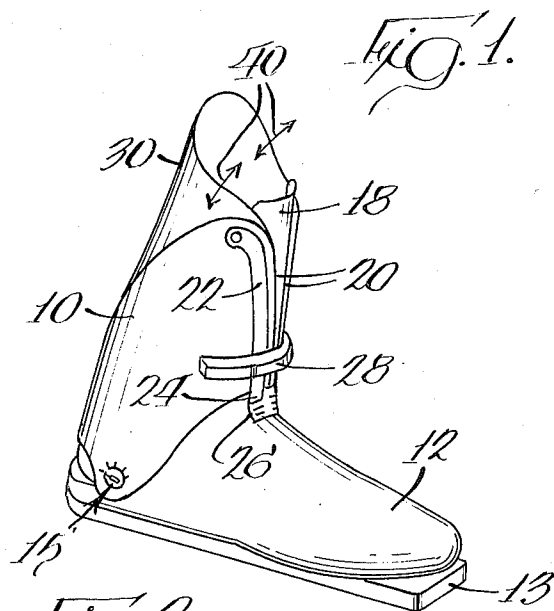
Primary Examiner—Patrick D. Lawson
Attorney, Agent, or Firm—Wegner, Stellman, McCord, Wiles & Wood

[57] **ABSTRACT**

A ski boot has an upper shell mounted to a lower shell by an eccentric member which can be rotated to cant the upper shell relative to the lower shell. In one embodiment, the eccentric member is a pivot pin having a pivot shank with an intermediate eccentric neck journaled within a circular aperture in the upper shell. By rotating a slotted head to different lockable positions, the eccentric neck cants the upper by different angles. In another embodiment, the eccentric member is a sleeve having an external, extending arm, movable between a plurality of detent apertures to cant the upper shell by different discreet angles. A fastener extends through the sleeve to attach the upper shell to the lower shell.

21 Claims, 5 Drawing Figures





SKI BOOT WITH CANTABLE UPPER

BACKGROUND OF THE INVENTION

This invention relates to a ski boot having an upper which can be canted by rotation of an eccentric member.

Cant as used with reference to ski boots and ski bindings refers to a lateral offset or tilt in a skier's upper leg with respect to the skier's foot or sole. Normally, the sole of a ski boot would not be perfectly flat when the skier is in a normal skiing posture, should the leg of a skier have a tilt or lateral offset due to bowleggedness or knock-kneed condition. This type of condition is quite common. In fact, many ski boots incorporate a slight cant in the upper shaft, such as 3° but such a fixed cant angle is an unsatisfactory compromise. While most custom canting is accomplished by placing a wedge between the ski binding and the ski, it is considered more desirable to cant the boot itself.

Prior ski boots have included a separate upper connected by metal stays with a lower vamp. The upper has been cantable by bending the metal stays or, by vertically sliding a bracket on the metal stay until a desired tilt is reached for the upper, and then attaching the bracket to the metal stay by a screw member which is received in one of a plurality of threaded bores in the metal stay. An example of such a ski boot is shown in U.S. Pat. No. 3,313,046 issued Apr. 11, 1967. It is also known to provide a turnbuckle for adjusting the cant of the upper.

Ski boots having uppers which are canted by bending or sliding movement along a metal stay, or by use of turnbuckles, have several disadvantages. The metal stay and bracket member, or the turnbuckle, besides being unnecessary extra parts, require extra space and special techniques for attachment when the upper is formed by a rigid plastic shell. Also, it is difficult, and sometimes impossible to adjust the cant of the upper while the skier is in the ski boot. Except in boots having metal stays which are bendable or turnbuckles, the only cant adjustment consists of a series of discreet cant positions. In certain conditions, it may be desirable to continuously vary the cant in order to better match the natural cant of a skier's leg.

SUMMARY OF THE INVENTION

In accordance with the present invention, a ski boot has an upper which can be canted relative to a lower by an improved canting mechanism consisting of a rotatable eccentric member. By incorporating the eccentric member into the hinge or pivot pin for the upper and lower shells of a rigid plastic ski boot, almost no additional parts nor extra space are required. The cant adjustment may be varied by the skier, while the skier has his foot in the ski boot, and continuous cant adjustment is possible.

One object of the present invention is the provision of an improved cantable ski boot using a rotatable eccentric member as the cant mechanism.

Other objects and features of the invention will be apparent from the following description and from the drawings. While illustrative embodiments of the invention are shown in the drawings and will be described in detail herein, the invention is susceptible of embodiment in many different forms and it should be understood that the present disclosure is to be considered as an exemplification of the principles of the invention

and is not intended to limit the invention to the embodiments illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a ski boot having a cantable upper and incorporating an improved cant mechanism;

FIG. 2 is an enlarged side view of the pivot pin portion of the ski boot of FIG. 1;

FIG. 3 is a sectional view taken along lines 3—3 of FIG. 2;

FIG. 4 is an enlarged side view, similar to FIG. 2 of an alternate embodiment for the cant mechanism; and

FIG. 5 is a sectional view taken along lines 5—5 of FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning to FIGS. 1—3, a ski boot includes an upper section or shell 10 and a lower section or vamp 12 having an integral sole 13. The upper shell 10 is affixed to the lower vamp 12 by a pair of identical mounting and cant mechanisms 15, located on opposite sides of the boot, and only one of which is illustrated in the drawings. Except for the mounting mechanisms 15, the illustrated ski boot is conventional and further includes a semi-rigid tongue 18 which is movable forwardly against the forward edges 20 of the upper shell 10 to spread the upper shell and thereby allow a controlled amount of forward flex. A metal strip 22 is mounted adjacent each forward edge 20 to reinforce the upper shell 10, which may be formed of a rigid plastic material.

The lower end of metal strip 22 forms a tang 24 insertable in one of a plurality of slots contained in a slotted plate 26 which is affixed to the forward portion of the vamp 12. A buckle 28 allows the two side sections of the upper shell 10 to be connected together. An extending semi-rigid cuff 30 forms a high back ski boot, with the rear cuff being somewhat flexible but still firmly supporting the skier's leg. When the buckle 28 is opened, the upper shell 10 can spread sideways, to clear the tongue 18, and then rotated rearwardly above the mounting mechanism 15, to allow rear entry to the ski boot. After the skier has placed his foot in the vamp 12, with the forward portion of his leg resting against the tongue 18, the upper shell 10 is pivoted forwardly and around the skier's leg, the metal tang 24 is placed in one of the slots in the slotted plate 26, and the buckle 28 is closed.

By placing the metal tang 24 in a more forward slot in the slotted plate 26, the forward lean of the upper shell 10 may be increased. When the buckle 28 is closed, the upper shell 10 is rigidly mounted relative to the vamp 12, because the interconnected metal tang 24 and slotted plate prevent any movement of the upper shell. However, the upper portion of the skier's foot may slide forwardly against a controlled amount of forward flex created by forward movement of the tongue 18 against the forward edges 20. During this movement, the buckle 28 serves as fulcrum point.

The custom fit the interior of the ski boot to a particular skier's foot, different thickness cushions or pads 34 may be inserted within the vamp shell 12. The pads 34 may be formed of a resilient plastic material, or a "flow" type material which will conform to a skier's foot under prolonged pressure but will not change form

under impact pressure, or other conventional inner type material. Pads 34 of different size may be nested inside each other, if desired, to reduce the interior dimensions of the vamp shell 12. Different height wedges 36 may be laid against the integral sole 13 to provide a downwardly slanted foot contacting upper surface 38, to provide forward lean for the skier's foot.

The above described ski foot, except for the mechanism 15, is conventional and is illustrated by way of example only. The illustrated ski boot (except for mechanism 15) is similar in principle to the ski boot illustrated in U.S. Pat. No. 3,486,247 issued Dec. 30, 1969. Because the metal tangs 24 are inserted in the slotted plate 26, the upper is locked relative to the lower during use. Thus, the ski boot is of the locked hinge type (but of adjustable forward lean) and has a rear entry method of access to the ski boot interior. The invention is equally adaptable for use with pivoted uppers which move with the skier's foot during use. In general, the invention is equally adaptable for use with any ski boot having a separate upper and lower which are connected together.

The novel mechanism 15 for connecting the upper 10 to the lower 12 also serves as the cant mechanism for canting or tilting the upper relative to the lower. By adjustment of the cant mechanism, the upper 10 may be moved sideways or laterally, as illustrated by arrows 40, relative to the vamp. This is accomplished by raising and/or lowering the side sections of the upper, to thereby produce a lateral tilt to the shaft of the upper.

In FIGS. 2 and 3, one embodiment for the mechanism 15 is seen to consist of an eccentric pivot pin having an eccentric threaded shank 44 relative to a neck 46 and an enlarged head 48. The neck 46 has a smooth circular periphery and is journaled in a circular bearing aperture 15 in the upper shell 10. The thickness of the neck 46 is slightly greater than the thickness of the upper shell 10, to allow sliding movement of the upper relative to the lower. The threaded shank 44 extends through a smaller diameter, circular aperture in lower shell 12. A nut 52 is threaded on shank 44.

To change the cant of the upper 10, the nut 52 is loosened and the eccentric pivot pin is rotated by a screwdriver or coin placed in a slot 56 in the head 48. As seen in FIG. 2, movement of the neck 46 about the eccentric threaded shank 44 moves the upper shell vertically (and longitudinally to some extent) to a new position, such as illustrated by the dashed lines 10. The bottom surface 60 of the neck 46 may be serrated so that upon tightening of the nut 52, the neck will be locked against rotation from the selected position. The exterior surface of the upper shell 10 carries angle degree markings 62 which indicate, in relation with a markings 64 on the head 48 (or in relation with the slot 56) the angular cant of the upper.

When the duplicate side pivot pins 15 locate the axes of their necks 46 vertically below the axes of their shanks 44, no cant is provided to the shaft of the upper. This represents the most stable position for the pivot pins. By rotating the slotted head of only one of the pivot pins, the upper shell 10 will be displaced upwardly on only that side, thus canting the shaft of the upper toward the other pivot pin. Alternatively, by rotating the opposite pivot pin, a cant of opposite slant with respect to vertical is provided. The canting mechanism is preferably located below the ankle bone of the

skier. In the illustrated embodiments, the pivot mechanism is located below the sole contacting surface 38.

By loosely screwing nut 52 against the lower shell 12, inserting the wedge 36 and then inserting his foot within the ski boot and closing the buckle 28, the skier can continuously adjust the cant angle by rotation of head 48, while his foot is in the ski boot, until the proper cant angle is reached. A mechanical canting machine may be utilized to aid the skier in determining his proper cant angle. Once the proper cant angle has been determined, the skier would remove his foot from the ski boot, remove the insert wedge 28, and tighten nut 52 to prevent any further rotation of the head 48. The ski boot is now properly canted and ready for on-slope use.

In FIGS. 4 and 5, an alternate embodiment for mechanism 15 is illustrated. A collar or sleeve 70 has an eccentric bore 72 which receives the shank 74 of a button-head rivet 76. The end 78 of the rivet is flattened to thereby secure the upper shell 10 and the lower shell 12 between the flattened end and the button-head. The length of the shank 74, between the button-head and the flattened end 78, is sufficient in length to allow sliding movement between the upper shell 10 and the lower shell 12. While a separate rivet is illustrated, the connecting member could be a post integral with shell 12 and extending outward, the post being flattened to secure the sleeve 70 thereon.

Eccentric sleeve 70 has an integral arm 80 with an extending detent nipple 82 which is received in one of a plurality of detent recesses 84 formed in the upper shell 10. The length of arm 80 and the resiliency of the material forming the arm are selected to allow the nipple 82 to be manually moved out of engagement with the recess 84, and the arm rotated until the nipple 82 is received in the next recess. Movement of the arm 80 to different detent positions rotates the eccentric sleeve 70 relative to the rivet shank 74, thus vertically displacing the upper (and somewhat longitudinally moving the upper) as to the new position 10'. Each different detented position of the arm 80 forms a different cant angle of the shaft of the upper shell. The arm 80 (not illustrated) associated with the pivot pin on the opposite side of the boot would, of course, be maintained in its zero degree cant detented position, in order to cant the shaft of the upper toward the not illustrated pivot pin. The cant adjustment is readily adjustable by the skier, and can be changed on a ski slope. The position of arm 80, relative to the pivot recesses 84, provides a visual indication of the cant angle, which may be marked directly on the upper, if desired.

As previously noted, a duplicate connecting mechanism 15 (not illustrated) is located on the opposite side of the ski boot of FIG. 1. However, only one cant mechanism 15 is essential, and the opposite connecting mechanism could be a conventional pivot screw or rivet. In such a case, the eccentric member would normally be located in an intermediate position, at which position the upper would be set to be of equal height with respect to the upper or the opposite side. By rotating the eccentric member to either side of the intermediate position, the upper would be raised or lowered relative to the opposite side, thus allowing cant to either side of a central vertical plane. Of course, only one cant mechanism is necessary if the upper shaft is to be tilted to only one side of the vertical plane.

Although the upper 10 of the illustrated ski boot is locked during use, and thus does not move relative to the lower 12, it will be appreciated that either cant mechanism 15 of FIGS. 2-3 or 4-5 is adaptable to ski boots having uppers which are pivoted during use. In addition, either cant mechanism 15 is adaptable for use with any ski boot having separate uppers and lowers, including permanently locked hinge ski boots. In the case of a permanently locked hinge ski boot, an additional locking bolt would be provided, in a manner which would not interfere with the canting action of the mechanism 15. For example, such a locking bolt could be connected at the center rear of the ski boot, and thus would allow tilting action to both sides of a vertical plane extending longitudinally through the ski boot. Alternatively, the locking bolt could be inserted through the side of the ski boot, within a vertical slot in the upper, to allow for the slight upward movement produced when the boot is canted.

While the eccentric member has been illustrated as being associated with the upper shell, the eccentric member could be associated with the lower shell. Other modifications and changes will be apparent in view of the above.

I claim:

1. A ski boot having an upper section which can be canted relative to a lower section, comprising:

an eccentric member mounted within one of said sections and rotatable about a connecting member associated with the other of said sections, the axis of the eccentric member being offset from the axis of the connecting member, and

adjustment means for allowing rotation of the eccentric member to change the position of the one section relative to the other section and for locking said eccentric member against rotation to thereby maintain a selected cant.

2. The ski boot of claim 1 wherein the eccentric member comprises an eccentric neck on a connecting pin having a shank corresponding to the connecting member, the shank extending from the neck and having an axis offset from the axis of the neck.

3. The ski boot of claim 2 wherein the shank is threaded and extends through an aperture in the other section and into the interior of the ski boot, and the adjustment means includes a nut threaded on the shank to draw the eccentric neck against the other section and thereby prevent rotation of the connecting pin.

4. The ski boot of claim 3 wherein the eccentric neck has a ribbed surface in abutment with the other side.

5. The ski boot of claim 1 wherein the connecting member comprises a shaft extending from the other section, and the eccentric member comprises a sleeve rotatable about the shaft, said sleeve having an axis offset from the center axis of the shaft.

6. The ski boot of claim 5 wherein the shaft extends through an eccentric bore in the sleeve and has an enlarged head for capturing the sleeve rotatably between the enlarged head and the other section.

7. The ski boot of claim 5 wherein the shaft comprises a rivet extending through an aperture in the other section and terminating in a flattened end for rotatably capturing between the enlarged head and the flattened end the upper and lower sections.

8. The ski boot of claim 5 wherein the sleeve has an extending arm carrying a detent means engageable with a detent means on a surface of one of the sections to

maintain the sleeve in a fixed position, the arm and the detent means corresponding to the adjustment means.

9. The ski boot of claim 8 wherein the detent means on the arm comprises a nipple receivable within one of a plurality of recesses located on the surface and corresponding to the other detent means, the arm being rotatable to each of the plurality of recesses to provide a plurality of discreet cant angles for the upper section.

10. The ski boot of claim 1 including an indicator movable with movement of the eccentric member and a series of markings spaced on an external section surface to visually indicate relative to the indicator the relative cant angle of the upper section.

11. In a ski boot having an upper shell separate from a lower shell, an improved connecting means which allows canting of the upper shell relative to the lower shell, comprising:

a pivot pin having a shank extending through a pair of different diameter bores located in the upper shell and the lower shell,

the shank having an eccentric neck offset from the axis of the shank and located in one of the bores, and

a lock member connectable on the shank for fixing the position of the eccentric neck relative to the shank.

12. The improvement of claim 11 wherein the pivot pin includes an enlarged head of greater diameter than the diameters of the bores, the shank being threaded and the lock member comprises a nut threaded on the shank for clamping the upper and lower shells between the enlarged head and the nut.

13. The improvement of claim 12 wherein the eccentric neck has a ribbed surface which engages the adjacent shell for locking the pivot pin relative thereto.

14. The improvement of claim 12 wherein the enlarged head includes an elongated slot for rotating the eccentric neck to a desired position and for visually indicating the relative cant angle of the upper shell relative to the lower shell.

15. The improvement of claim 12 wherein the length of the eccentric neck is greater than the thickness of the surrounding shell to allow free pivotal movement of the shell about the eccentric neck.

16. The improvement of claim 15 wherein the upper shell forms a rear entry door for the ski boot, means for locking the rear entry door in a forward position for skiing, the locking means being openable to allow the rear entry door to be pivoted about the pin into a rear entry position.

17. In a ski boot having an upper shell separate from a lower shell, an improved connecting means which allows canting of the upper shell relative to the lower shell, comprising:

a shaft extending outward from an inner shell and at least partly through a bore in an outer shell,

an eccentric sleeve rotatably received in the bore and having an interior bore rotatably receiving the shaft and with an axis offset from the center axis of the sleeve, and

an adjustment member extending from the eccentric sleeve for rotating the sleeve to different lockable positions to produce different cant angles for the shells.

18. The improvement of claim 17 wherein the adjustment member comprises an arm extending along an external surface of the outer shell, and means for detent-

7

8

ing the arm at a plurality of spaced positions along the external surface.

19. The improvement of claim 18 wherein the detenting means comprises a nipple located on the arm and extending inwardly toward a series of recesses formed in the external surface for receiving the nipple to detent the arm and sleeve.

20. The improvement of claim 17 wherein the shaft comprises a rivet extending through bores in both of

the shells and having a pair of enlarged ends for rotatably capturing therebetween the shells.

21. The improvement of claim 17 including platform means located within the inner shell for defining a sole engaging surface for a skier's foot, and the shaft being located between the platform means and the bottom of the inner shell.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65