Oct. 15, 1968 F. D. WERNER 3,405,463

SKI BOOT HAVING A HINGED DOOR

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FIG. 4

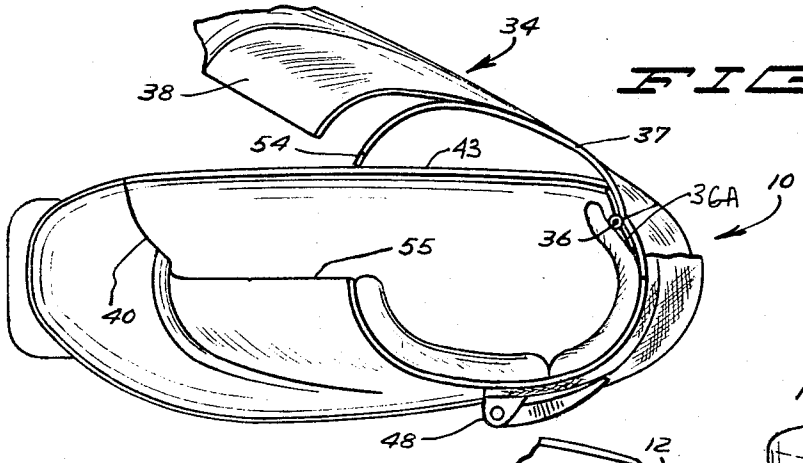
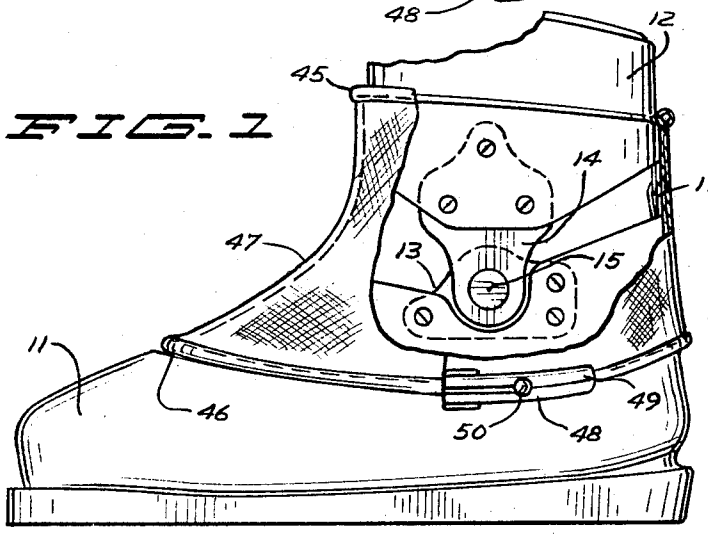


FIG. 1



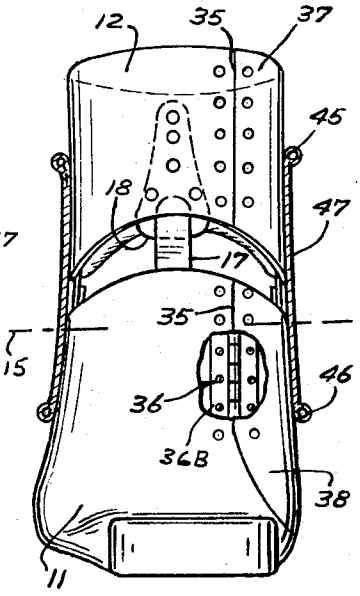


FIG. 2

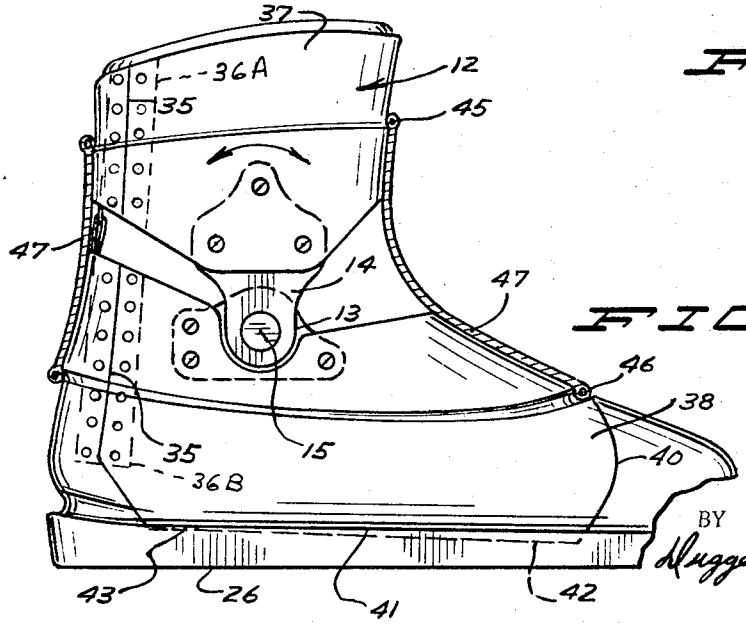


FIG. 3

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SKI BOOT HAVING A HINGED DOOR

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FIG. 5

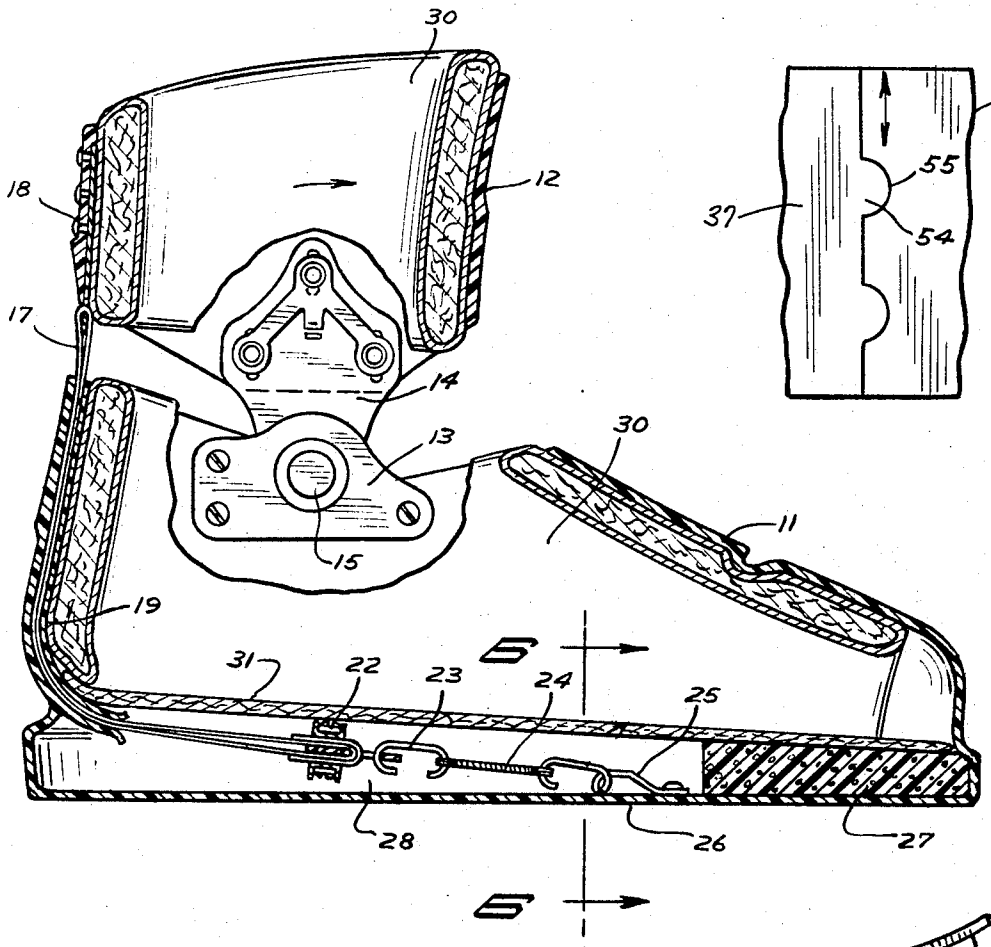
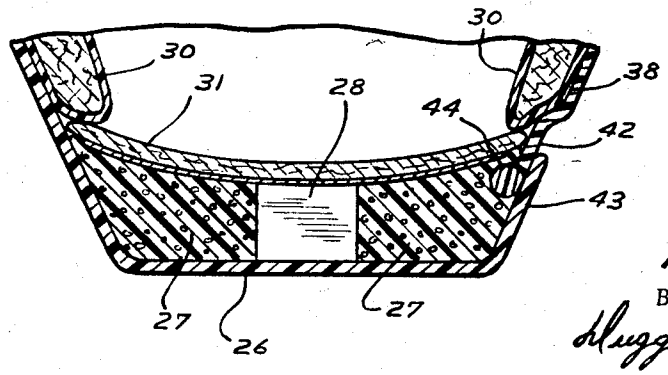


FIG. 7

FIG. 6



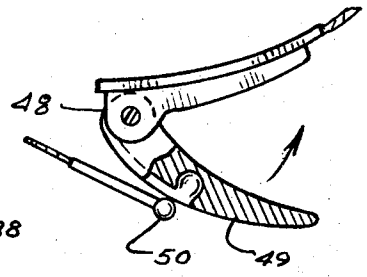


FIG. 8

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United States Patent Office 3,405,463 Patented Oct. 15, 1968

3,405,463

SKI BOOT HAVING A HINGED DOOR

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Filed Oct. 8, 1965, Ser. No. 494,432
4 Claims. (Cl. 36—2.5)

ABSTRACT OF THE DISCLOSURE

A ski boot made of a substantially rigid material having a lower portion and a hinged ankle cuff portion with an access door comprising a substantial side portion of the lower part of the boot and a section of the ankle cuff portion wherein the door is attached to the main part of the boot with a hinge that has an axis extending in upright direction, and which has a section on the cuff and a section on the lower part of the boot.

The present invention has relation to ski boots and more particularly to a ski boot which has a hinged door to permit foot access into the boot, and which has the hinge located in a manner to give good accessibility to the boot, rigidity to the structure, and which increases the ease of putting the boot on and taking it off.

The present invention relates to an improvement in the location of a hinge used for attaching an access door to a ski boot, particularly where the ski boot has a rigid shell and has an upper ankle cuff. The ankle cuff can be articulated to the lower portion of a boot, if desired. The boot as disclosed has a door which is hingedly attached to the main part of the boot about a substantially upright hinge axis adjacent the rear of the boot. Thus when the door is opened about this axis the front portions of the boot are most widely opened so the toes and instep can be easily placed in the boot. The door remains off the floor and is easily closed.

Previously, in rigid or hard shell boots where the hinge line of the door was down along the sole of the boot and in a longitudinal direction, the door or flap, when it was open, would be laying on the floor, and could get damaged. In previous boots the ankle cuff portion was split along two parting lines, the two cuff sections separated completely when the door was opened. Then, it was possible to have problems in aligning the two portions when the boot was placed onto the foot and the door was to be closed.

The boot is easier to put on when the door is hinged about an upright axis as disclosed herein because when the door is open the upright hinge holds the two ankle cuff portions aligned. The upright hinge works well whether the cuff portions are pivotally mounted to the lower portion or not.

Therefore, it is an object of the present invention to present a ski boot having a hinged door wherein the hinge axis is substantially upright.

It is another object of the present invention to present a ski boot having a hinged door which includes a door ankle section that is also hinged to a main ankle section.

It is a further object of the present invention to present a ski boot having a hinged door which includes an ankle cuff portion having two sections which separate along one parting line only when the door is in open position.

Other objects will be apparent as the description proceeds.

In the drawings,

FIG. 1 is a side elevational view of a ski boot having a door attached thereto for permitting foot access and mounted according to the present invention;

FIG. 2 is a rear elevational view of the device of FIG. 1 with parts in section and parts broken away;

FIG. 3 is a side elevational view of the device of FIG. 1 as viewed from an opposite side thereof, with parts in section and parts broken away;

FIG. 4 is a top plan view of the device of FIG. 1;

FIG. 5 is a vertical sectional view of the boot of FIG. 1;

FIG. 6 is a fragmentary enlarged sectional view taken as on line 6—6 in FIG. 5;

FIG. 7 is a fragmentary front elevational view of the cuff of the boot of FIG. 1; and

FIG. 8 is a fragmentary top view of a cable clamp used with the present invention with parts in section and parts broken away.

Referring to the drawings and the numerals of reference thereon, a ski booth illustrated generally at **10** is comprised basically of two main portions, namely a lower shoe portion **11** and an ankle cuff portion **12**. The lower portion **11** has a pair of brackets **13, 13** fixedly attached thereto and a second pair of brackets **14, 14** are pivotally mounted on a transverse axis **15** to the brackets **13, 13**. The brackets **14, 14** are in turn releasably attached for limited vertical sliding movement to the cuff portion **12** with screws. The ankle cuff portion can thus pivot about a transverse axis **15** with respect to the lower portion of the boot. This pivotal axis substantially aligns with the pivotal axis of the ankle of the wearer of the boot so that the wearer can move his lower leg fore and aft with respect to the lower portion of the boot.

As can be seen, the lower edge portions of the cuff are spaced upwardly from the lower portion of the boot to permit this pivoting.

Referring to FIG. 5, it can be seen that the forward pivoting of the boot is resisted by a strip **17** made of suitable webbing, that is attached to a bracket **18** that in turn is attached to the cuff adjacent the rear portion thereof. The strap passes down through a provided guide tube **19**, and is attached to a bracket **22**. A plurality of tension members **23** are hooked into bracket **22** (there usually are three or more tension members). Each tension member has an elastomeric center section **24** which will resiliently yield to permit forward pivotal movement of the cuff. The other end of each tension member is anchored with another bracket **25** to the sole **26** of the boot. The tension members have end hooks that fit within provided openings in the brackets. If more resistance to forward pivoting is desired, more tension members can easily be hooked into place. If less resistance is desired one or more members can be removed.

The insole **31** of the boot is actually supported above the brackets of the tension members with a block of suitable foamed plastic material **27** which extends longitudinally along the boot and has an open channel **28** to permit the strap and tension members to be positioned in place adjacent the sole and between the sections of the support. The insole is supported over the open channel with a metal support plate. The insole can be removed for replacing or adding the tension members.

The boot shell is made out of a suitable hard, rigid material, such as a thin fiberglass reinforced epoxy, or it could be of a metal material or other lightweight, rigid material. For example, a fiberglass reinforced plastic about 1/16–3/32 of an inch thick is satisfactory. The material is not damaged by water, heat, or cold and provides a hard exterior.

The interior surfaces of the cuff section **12** and the lower section **11** are lined with suitable padding which is shown schematically at **30** in the drawings. The padding does not form part of the invention and it is understood that this padding can be of any suitable type which will hold the foot firmly inside the shell, and will prevent the hard outer shell or covering from causing discomfort to the foot. The padding should be of a type which will conform to the foot shape and hold the foot snugly with respect to the outer shell in this manner. The pads can be

filled with shredded foam rubber, or a filling of discrete particles surrounded by a thin coating of lubricating oil or grease has been found to be excellent. Several individual filled pads that are fastened into place with snaps and which can be removed for fitting are preferred.

Access to the interior of the boot is provided by a door assembly illustrated generally at **34** which will open so that a foot can be inserted into the boot, after which the door **34** is closed and held in closed position. The padding then holds the foot firmly within the boot.

As shown, the door assembly **34** is hinged to the main part of the boot along a hinge line or axis **35** which is adjacent the rear portion of the boot and has an axis that is substantially upright. The hinge member illustrated generally at **36** has two sections, one **36A** on the cuff, and another **36B** on the lower boot. The hinge is of the piano hinge-type that lays fairly flat to avoid discomfort to the foot inside the boot. Each hinge section has two parts that interlock along the hinge axis. One part of each hinge section is attached to the door and the other is attached to the main part of the boot. The parts are held in interlocking relation with a hinge pin. The hinge has to permit sufficient amount of movement of the door so that it can be opened to allow a foot to be inserted into the main part of the boot. The hinge member lies along the boot and extends upwardly along the lower portion and also the cuff portion. As long as the hinge members are on both the lower portion and the cuff portion they are considered to be on a substantially upright axis. When the boot cuff is not articulated, the hinge can be continuous from adjacent the sole to the top of the cuff.

The door assembly **34** includes a lower section **38** which is part of the lower portion **11** of the boot and a cuff section **37** which is part of the cuff portion **12**. The cuff portion is thus made of two cuff sections and the lower boot portion is also two sections. The door assembly incorporates a section of the lower portion of the boot and a section of the cuff portion of the boot. In order to have adequate designation, the part of the boot other than the door assembly will be designated the main boot.

The cuff section of the hinge and the lower section of the hinge pivot on the same axis when the door is opened. Yet the cuff can pivot about axis **15** during use. In the "rest" position of the cuff in respect to movement about axis **15**, the axes of the two hinge sections **36A** and **36B** align and they can be considered a continuous hinge member **36**.

The lower section **38** of the door assembly extends forward into the toe area along parting line **40**. The door also curves downwardly and forwardly from the hinge line **35** so that it has clearance to swing open and it extends along the sole member as at **41**.

Referring specifically to FIG. 6, it can be seen that the lower portion of the door has an offset edge section **42** which fits within the main portion of the boot and inside a ledge **43** formed upwardly from the sole. The amount of overlap of the edge section **42** and the ledge **43** increases from the rear to the front so the door can be sprung slightly to permit the overlap of the edge. The edge section **42** seats against a gasket **44** mounted in one of the blocks **27** which in turn is attached to the sole **26**. The gasket **44** is neoprene or other suitable material and insures that the boot is sealed along the bottom of the door to prevent water and snow from entering and to keep drafts out.

The door is held closed by encircling it with a pair of cable assemblies, namely an upper cable assembly **45** and a lower cable assembly **46** which are held in opposite marginal edge portions of a shroud **47**. The shroud **47** is made of a suitable fabric material and surrounds the boot when it is in closed position. The shroud extends between the lower portion of the boot and the cuff portion. The cable assemblies **45** and **46** are each held closed with separate suitable overcenter clamps illustrated at **48**. The clamps can be of any preferred design, and as shown are attached to one end of the cables. A clamp lever **49** can be lifted up to release a spherical ball **50** that is attached to the second end of the cable and which seats within a provided ball socket in the lever. The ball can be removed from the socket when the lever is released. When both cables are released the cables and shroud can be folded to allow the door to open as shown in FIG. 4. When closed the levers go overcenter so the cables are held tightly. Each of the cables **45** and **46** has this overcenter clamp arrangement. The cables can be adjustable in length if desired. The shroud **47** shields the open space between the cuff assembly **12** and the lower portion **11** of the boot and also gives a smooth, attractive appearance to the boot. The shroud can remain attached to the boot when the door is open and parts at the front so that part of it moves with the door and folds out of the way.

The door could be held closed with other suitable clamps, such as overcenter luggage clamps between the door and the main portion of the boot. Then, some other means of shielding the opening between the cuff **12** and the lower portion of the boot would be provided to exclude snow from this area.

Once the lower edge section **42** of the door **35** has been snapped inside the boot, the parts will be sealed very well and the cable assemblies **45** and **46** will hold the door in closed position so that the foot is held snugly in the boot.

The use of the hinge having a substantially upright axis permits the two sections of the cuff to remain joined along one of their parting lines. The cuff sections remain on an assembly when the door is opened and are held in alignment by the hinge section **36A**. Further, the rigidity of the door and boot assembly, with the door in its open position is enhanced because the door section of the cuff cannot pivot about axis **15** independently. Without the upright hinge connecting the two sections of the cuff together, the door section of the cuff could pivot about the ankle axis and become misaligned with the cuff section that remains with the main part of the boot. This would make it difficult to place back in position.

The hinged parting line of the cuff section is held from vertical shear movement by the hinge and the front parting line has complemental interlocking members (see FIG. 7) that prevent vertical shear movement between the sections when the door is closed. Lugs **54** on the door cuff section of the boot will fit within aligned receptacles **55** of the section of the cuff remaining with the main portion of the boot. Once these two sections are in position and the door locked closed, there can be no vertical shear movement between the two cuff sections. The aligning of these interlocking members is greatly simplified by the use of the upright hinge **36** because the cuff sections are always held together along the hinge line even when the door is open. Likewise the lower section **38** of the door is held by the hinge so that alignment of this lower section of the door is maintained even when the door is open. The hinge pins keep the door and main portions of the boot from moving out of alignment in direction normal to their surfaces as well, thereby maintaining rigidity and a neat appearance.

Even without a hinged upper cuff section, in boots having stiff or rigid sections, the upright hinge axis will work to aid insertion of the foot into the boot and give better rigidity.

The use of an upright hinge axis is not limited to use behind the foot but it will most generally be placed behind a vertical plane which passes through the axis of the ankle hinge. In other words, the hinge will usually be to the rear portions of the foot behind the ankle bone, with the opening at the front. This will make it easier to insert the toe and instep portion of the foot into the

boot, and will provide a better clamping action at the heel of the boot when the door is closed.

Another feature is that for storage of either long or short duration the door can be urged closed or opened easily with small springs or rubber binders. The door is not easily damaged from being stepped on.

A cable-shroud assembly of the general type that will work is shown in the application of Frank D. Werner et al., Ser. No. 444,220, filed Mar. 31, 1965 which issued as U.S. Patent No. 3,313,046 of Apr. 11, 1967.

What is claimed is:

1. A ski boot comprising an outer shell made of a substantially rigid material and including a lower boot member having a sole portion suitable for use in attaching the boot to a ski and an ankle cuff member, means to pivot said ankle cuff member to the lower boot member about an axis substantially aligning with the axis of movement of the ankle of a wearer and designed to permit the lower leg of a wearer to pivot with respect to a foot in the boot, access means to permit a foot to be inserted into the interior of said boot comprising a door, hinge means mounting said door to the remainder of the boot, said door including a lower boot section and an ankle cuff section and being movable on its hinge means between an open and a closed position, said door lower boot section comprising a substantial portion of a longitudinal side of the boot extending from a junction adjacent to the front part of the boot to a junction rearwardly of the means to pivot the ankle cuff member to the lower boot member, said hinge means including a first hinge section between the lower boot section of the door and the remainder of the lower boot member and having an axis extending in upwardly direction along the rearward junction between the lower boot section of the door and the remainder of the lower boot member, and

a second hinge section along the rearward junction between the door ankle cuff section and the remainder of the ankle cuff member, said hinge sections being completely separated to permit independent pivotal movement of the ankle cuff member about its axis of pivotal movement with respect to the lower boot member when the door is closed.

2. The ski boot of claim **1** wherein the hinge sections each comprise two hinge parts, one on the door and one on the remainder of the boot, said hinge parts comprising interlocking members, and means co-operatively engaging the interlocking members from each of the hinge parts, said interlocking members snugly fitting together to carry shear forces in direction along the axis of said hinge.

3. The ski boot of claim **1** and resilient gasket means between the door in the remainder of the boot adjacent the lower part of the door.

4. The ski boot of claim **1** and a plurality of pads positioned on the interior of the boot to hold a foot within the boot securely with respect to the boot.

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