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Smolka et al.

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[54] SOLE SUPPORT APPARATUS

[75] Inventors: Thomas Gordon Smolka, Wien-Mauer; Gottfried Schweizer, Wien, both of Austria

[73] Assignee: Gertsch AG, Zurich, Switzerland

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[51] Int. Cl. A63c 9/08, A63c 11/00

[58] Field of Search ..... 280/11.35 C

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Primary Examiner—Kenneth H. Betts

Assistant Examiner—David M. Mitchell

Attorney, Agent, or Firm—Woodhams, Blanchard and Flynn

[57] ABSTRACT

A device for facilitating the emergency release of a ski boot from a ski by minimizing friction between the ski boot and the ski. The device broadly consists of a rotatable, normally circular, member rotatably mountable on the ski and arranged to lie between the boot and the ski in the normal position of use. The rotatable member is arranged so that only a portion thereof which is moveable substantially across the ski contacts the boot, said limited contact being effected by any mechanically convenient means including either suitable tilting of the rotatable member or masking the portion not to be contacted by the boot. Antifriction means, as ball or roller bearings, may be used between the rotatable member and either the boot or ski.

4 Claims, 4 Drawing Figures

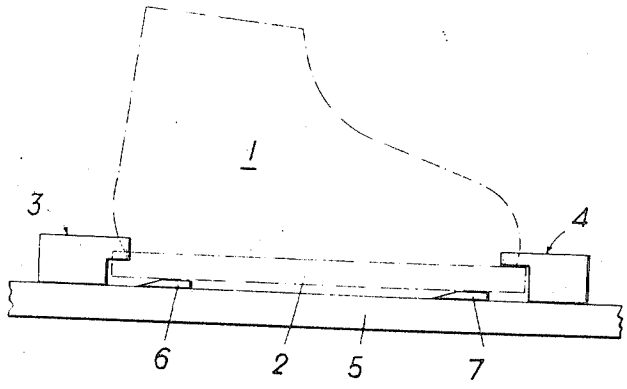


FIG. 1

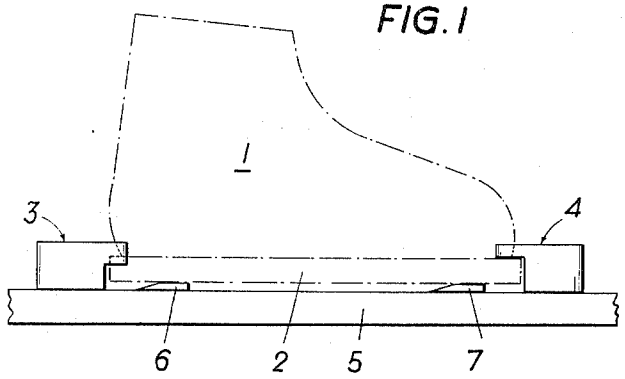


FIG. 4

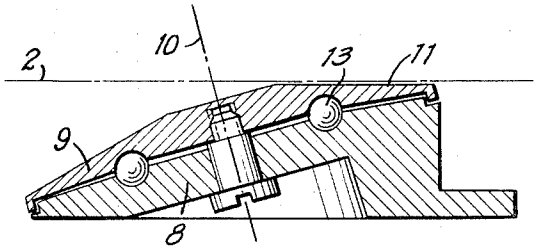


FIG. 2

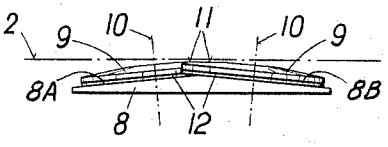
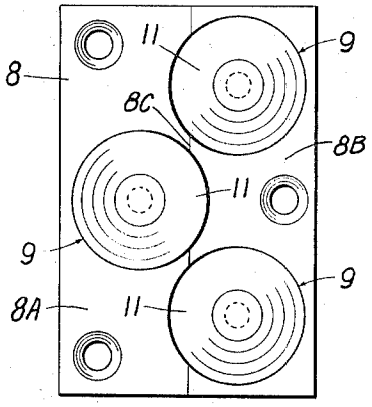


FIG. 3



INVENTORS
THOMAS G. SMOLKA
GOTTFRIED SCHWEIZER
BY
Woodhams, Blanchard and Flynn
ATTORNEYS

SOLE SUPPORT APPARATUS

The invention relates to a sole support apparatus which has at least one element which is supported movably on the ski and on which the sole of the ski boot rests when in use.

In order to reduce the friction which occurs during a release operation during which the ski shoe moves relative to the ski, plates which are mounted onto the ski have already been suggested. Such a known plate consists for example of a disk rotatably supported on the ski. In order for this plate to fulfill its purpose, the pivot point about which the ski boot pivots would have to be substantially coincident with the axis of rotation of the disk. However, depending on the particular conditions, the ski boot does not always rotate around the same axis so that in most cases variable frictional forces still occur between the ski shoe and the plate.

Similar plates are also known which at the moment of a release move with the ski boot relative to the ski and are returned into their original central position by resilient return means. Such plates are expensive since additional return means are required and furthermore such resilient return means can be easily damaged. If in a given instance the return means no longer function, then the plate is stopped on one side; namely it can no longer move in this direction relative to the ski. Thus, again, depending on the particular surface structure of the plate and the ski boot sole, different frictional forces will occur. It is the uprpose of the present invention to avoid these disadvantages and to produce a simple apparatus in which a return is not required and the friction is maintained substantially low and constant.

This purpose is attained by constructing the movably supported element as a rotatable member. Said rotatable member is then so mounted as to contact the ski boot sole with one but only one portion of its surface which portion is movable substantially transversely of the ski and the portions of the circular member which then moves during the release operation relative to the movement of the boot, do not contact the boot sole.

The subject matter of the invention is illustrated in several embodiments in the drawings, in which:

FIG. 1 illustrates the mounting of a ski boot on the ski.

FIGS. 2 and 3 illustrate views associated with one another of a sole support apparatus with three disks.

FIG. 4 illustrates in an enlarged scale a particular construction of a disk.

According to FIG. 1, the ski boot 1 is held with a sole 2 on the ski 5 between appropriate binding parts, for example a rear tensioning means 3 and a front jaw 4. During a twisting fall, the boot 1 is twisted out opposite the ski 5 from the binding parts 3 and 4. Depending on the adjustment of the binding parts 3 and 4, the boot is pivoted about the sole point or about an axis in the area of the heel. In order to assure such freeing of the boot, according to the invention one or more sole support apparatuses 6,7 which reduce the friction (or rather maintain the friction constant) are arranged between the ski boot and ski.

The sole support apparatus in FIGS. 2 and 3 consists of a base plate 8 mounted to the ski 5. The base plate 8 has a pair of inclined surfaces 8A and 8B thereon, facing in opposed directions and joined together along a common edge 8C. The base plate 8 has three rotatable members, here disks, 9 rotatably mounted

thereon, one disk member on the surface 8A and two disk members on the surface 8B. The axes of rotation 10 of the disks are arranged inclined to the surface of the ski 5 but not in the same direction. Furthermore, each disk 9 is constructed approximately like a plate. Through this the sole of the boot 2 rests only on a portion of the surface 11 of the disk 9, which surface is formed by the platelike inclination. Theoretically the contact of the inclined surface 11 and the boot sole 2 takes place only on one line. During a safety release the disks roll with their inclined surface 11 along the ski boot. With this arrangement it does not matter about which point the ski boot pivots with respect to the ski. Of course, the inventive sole support apparatus is arranged corresponding to the ski bindings used.

The axis of one disk 9 is here for example inclined leftwardly of a plane perpendicular to the longitudinal axis of the ski and the axes of both other disks 9 defining a theoretical base line of the triangular arrangement (which base line is preferably perpendicular to the longitudinal axis of the ski) are inclined rightwardly of the plane. The conical platelike inclined surfaces 11 (surface of frustums) of the disks 9 are thus positioned in the zone where they contact the shoe sole 2 in one plane. During a safety release the shoe then rolls along three disks toward the side.

In the embodiments discussed thus far, low friction spacers 12, for example of Teflon, are provided between the disks 9 and the base plate 8 in order to reduce the friction as much as possible. In order to reduce the friction still further, ball bearings can also be provided between the base plate and disk. Such a construction can for example be as shown in FIG. 4. Here balls 13 are provided in grooves between the disk 9 and the base plate 8, which balls, if necessary, can also be arranged in a ball cage. Thus when the disk 9 rotates, same rolls along the balls.

We claim:

1. In a sole support apparatus adapted to materially reduce the friction between the boot sole of a skier and the ski in the area beneath one of the heel and the ball of the foot in pivotal action about the heel upon release of the boot toe by a toe binding due to excessive lateral pressure, said apparatus having a mounting plate adapted to be secured to a ski in the general area beneath one of the heel and the ball of the foot of a skier, the improvement comprising:

three disk members rotatably mounted on said plate and adapted to be engaged by the boot sole of a skier, said plate having a pair of upwardly inclined surfaces thereon facing in opposed directions and joined together along means defining a common edge, each of said disk members being identical and having a conical surface defined by a frustum the axes of which are coaxial with the respective axes of rotation of each of said disk members, said disk members being rotatably mounted on said plate, one disk member on one of said inclined surfaces of said plate, the remaining two disk members on the other of said inclined surface of said plate and arranged to define an isosceles triangle and adapted to rotate in either direction as required upon the occurrence of a relative movement between the boot sole and said plate, the theoretical base of said triangle arrangement being perpendicular to the longitudinal axis of said ski and the axis of rotation of said disk members located on said

theoretical base line being disposed at an angle to a theoretical vertical plane containing said common edge and perpendicular to the longitudinal axis of said ski, and the axis of the disk member located at the apex of said triangle being disposed at an angle to said plate on one side thereof but in an opposite direction from said first mentioned axes on the other side of said plane so that the surfaces of each of said frustums engage a common plane defined by the bottom of said boot sole along parallel lines.

2. The improvement according to claim **1,** including low friction means between said disk members and said mounting plate.

3. The improvement according to claim **2,** wherein said low friction means are low friction material spacers.

4. The improvement according to claim **2,** wherein said low friction means are ball bearings.

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