

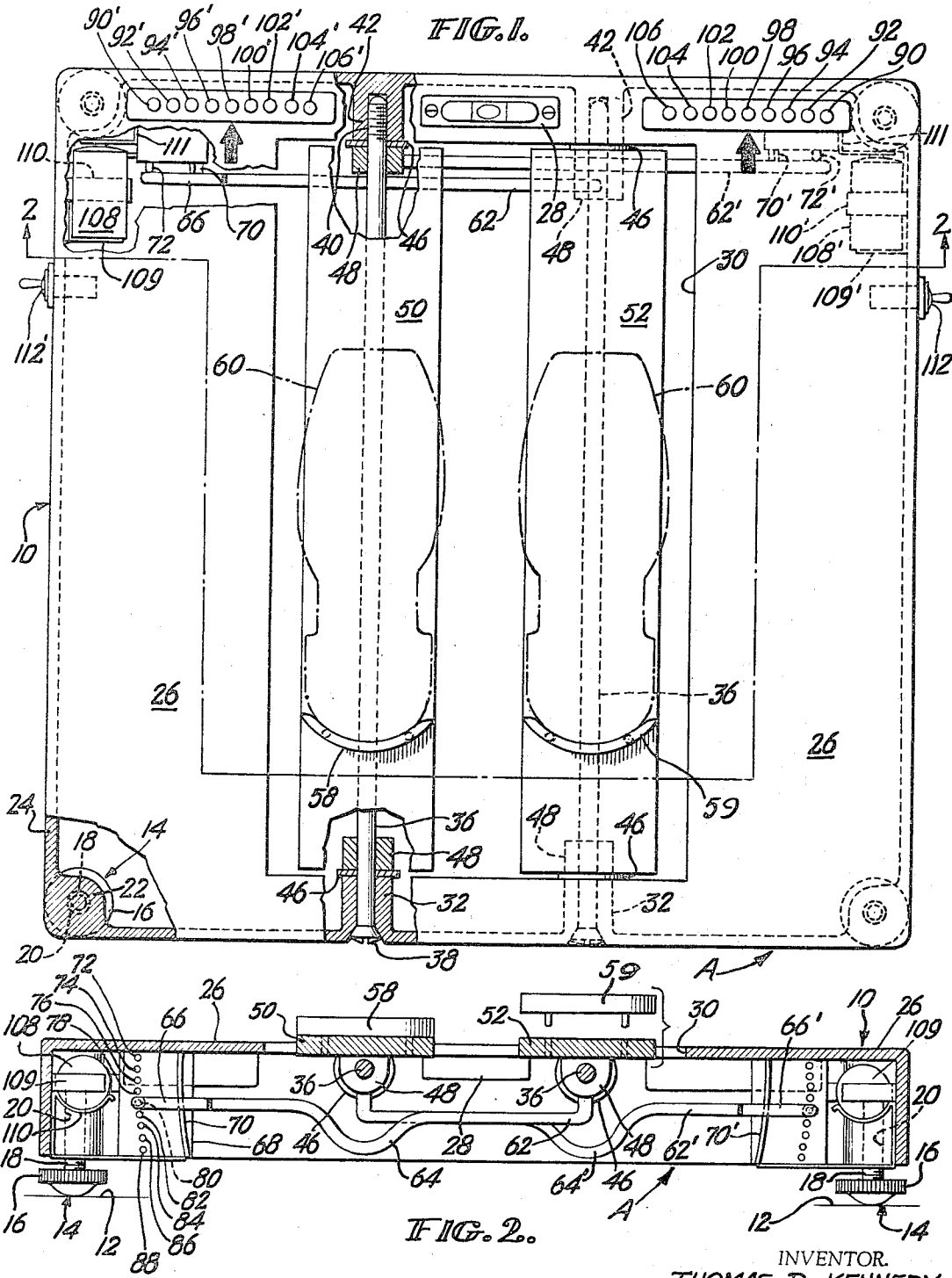
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SKI BOOT LEVEL INDICATOR

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SKI BOOT LEVEL INDICATOR
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This invention relates to a ski boot level indicator, and pertains more particularly to a mechanism for checking any deviation from a laterally level condition of the bottom of the sole and heel of each of a pair of ski boots while the latter are being worn.

Many people do not normally stand, walk or ski with the soles of their feet laterally level. In walking this condition results in increased wear on one side or the other of the person's shoe worn on the affected foot. In skiing when the bottoms of both skis are not laterally level when a skier is in his normal skiing stance, it requires muscular correction just to ski straight ahead or down hill. Also, when the skis are not normally level the skier finds that he turns more easily and naturally one way than the other. In fact, where this condition exists muscular compensation must be made for every maneuver performed by the skier, and such a person rarely becomes really good at the sport.

An object of the present invention is to provide an improved mechanism for indicating the laterally level condition of the bottoms of a pair of ski boots when the latter are being worn.

A further object of the invention is to provide a portable indicator for checking the level condition of the bottoms of the sole and heel of each of a skier's boots when the latter are being worn.

The foregoing objects and advantages of the invention will be apparent from the following description and the accompanying drawings, wherein:

FIG. 1 is a top plan view of a boot sole level indicator embodying the present invention, portions being broken away.

FIG. 2 is a vertical sectional view taken along line 2—2 of FIG. 1, one heel plate being spaced upwardly from its step plate.

Referring to the drawings, an illustrative boot sole level indicator A embodying the invention comprises a frame 10 supported on a floor 12 (FIG. 2) by the domed heads of four leveling screws 14, one of which is provided at each corner of the frame. Each screw 14 has a knurled rim 16 and a threaded stem 18, the latter of which is screwed into a threaded hole 20 provided one in each corner of the frame. The frame 10 has an integral platform portion 26 and lateral frame level indicating means are provided, such as a conventional bubble level 28 mounted flush with the top of the frame 10. By adjusting the leveling screws 14 the frame 10 can be precisely leveled even when supported upon an irregular or slightly non-level surface.

A rectangular opening 30 is provided in the platform 26, and a pair of integral, axially drilled and axially parallel cylindrical bosses 32 (FIG. 1) extend inwardly to the edge of the opening 30 from the rear or lower end portion of the frame 10 and closely beneath the platform 26. A pair of step plate pivotal support screws 36, each having a head 38 and a threaded end opposite portion 40, are inserted one in each of the rear drilled bosses 32, and are screwed in axially parallel relation, into a pair of internally threaded drilled bosses 42 which extend inwardly from the upper or forward end of the frame 10. A pair of washers 46 on each screw 36 are interposed one between each of the bosses 32 and 42 and a pair of step plate mounting ears 48 which depend one from each end of each of a pair of laterally tilting step plates 50 and 52.

The ears 48 of each of the step plates have axially aligned holes therein centered beneath their respective step plates and of a diameter to receive one of the rods 36 for relative pivotal movement thereon. Each step plate is positioned with its top surface slightly above the top of the platform 26.

Suitable boot positioning means such as removable heel plates 58 and 59 preferably are provided for the step plates 50 and 52, respectively, to aid in longitudinally centering a pair of ski boots on the step plates as indicated by the broken lines outlines 60 and 61 (FIG. 1). If desired, conventional ski bindings, not shown, may be provided on the step plates, or, if the wearer desires to check the level condition of his stance while actually wearing skis, the top surfaces of the step plates may be left flat and unencumbered so that one ski can be centrally aligned on each step plate.

Indicating means are provided for each of the step plates, and, since such means are similar but reversed for both step plates, that of the right hand step plate only is described in detail. An indicator needle 62 affixed to the forward mounting ear 48 of the step plate 52 extends laterally toward the opposite side of the frame 10, and has a curved portion 64 (FIG. 2) formed therein to provide operating clearance from the left hand pivot support screw 36 during indicating movement of the needle.

An electrical contact portion 66 is provided on the free end of the needle 62 and rides along a supporting ridge 70 of electrically conductive material, such as copper, and also along a row of contact points 72, 74, 76, 78, 80, 82, 84, 86 and 88 (FIG. 2) aligned in the plane in which the needle contact portion 66 swings. The ridge 70 is electrically connected to one side of a conventional indicating light circuit and is insulated from the contact points except when bridged to an individual one thereof by the contact portion 66 of the needle. The contact points are electrically insulated from each other. A plurality of indicator electric lights 90, 92, 94, 96, 98, 100, 102, 104 and 106 are mounted on the frame 10, preferably on the same side of the frame as the step plate which controls them, and are electrically connected, one to each contact point, in sequence corresponding to that of the contact points.

Electrical current is supplied to the indicating light circuit by suitable means, for example, by an electrical dry cell battery 108 mounted in a spring clip 110 on the frame 10. Contacts 109 and 111 electrically connect the battery 108 with the light circuit and a conventional electrical switch 112 is provided to energize the circuit. Since suitable circuitry will be obvious to anyone having even a rudimentary knowledge of electrical circuits, and since the circuit is not per se a feature of the invention, the details thereof are omitted.

Electrical indicating means similar to those described for the right hand step plate 52 are provided for indicating any tilt deviation of the left hand step plate 50, and corresponding parts of the indicating means for the left hand step plate are designated by the same reference numerals as those for the right hand step plate with the prime (') added.

In operation, the indicating mechanism A is placed upon a suitable supporting surface 12, and the leveling screws 14 are adjusted until the level 28 indicates that the platform 26 is laterally level. The circuit switches 112 are closed to energize the indicator light circuits, and the person to be checked, wearing his ski boots, steps onto the step plates 50 and 52 with his right ski boot longitudinally centered upon the right hand step plate 52 and his left ski boot similarly centered on left hand step plate 50. With the person being tested standing in his normal skiing stance, if the center lights 98 and 98' are both

illuminated it indicates that the bottoms of both boots are level and that no correction is required.

If the bottom of either boot is not level it causes a corresponding lateral tilt of the step plate 50 or 52 upon which it is supported which causes the indicator contact needle 62 or 62' connected thereto to swing up or down as the case may be to contact one of the other contact points and illuminate the indicator light associated therewith. The light thus illuminated for each step plate indicates the direction and amount of tilt of the associated step plate and the bottom of the boot resting thereon.

With the readings thus obtained, the bottom surfaces of each boot sole and heel are then either built up by attaching suitable wedge-shaped sole pieces thereto, or are ground off or corrected by other conventional boot-making procedures to provide the correction indicated as required by the indicating mechanism A. Since such boot-making procedures are conventional and are well known particularly among orthopedic bootmakers, and since the boot sole correction procedure is not per se a feature of the present invention, it is not illustrated or described herein.

After the boots have thus been modified the subject again puts on the boots and repeats the test described previously herein to insure that the proper correction has been made.

The invention provides a quick, easy and accurate means for measuring, and thereby providing accurate data for correcting, any lateral angular deviation from a level conditions of the bottoms of a skier's boots, and thereby of his skis, when a skier is in a normal skiing stance. It has been found that when a skier who does not normally stand with both feet laterally level has his boots altered as described herein his skiing usually shows a marked and early improvement.

While I have illustrated and described a preferred embodiment of the present invention, it will be understood, however that various changes and modifications may be made in the details thereof without departing from the scope of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is defined in the following claims:

1. A ski boot level indicating mechanism comprising:
a frame,

means for laterally leveling the frame,
a pair of step plates mounted in side-by-side relation on the frame, each step plate having an upwardly exposed surface for supporting one of a pair of ski boots being worn by a subject and for thereby supporting said subject, means for mounting each step plate for free lateral tilting movement to correspond with a lateral tilted condition of the ski boot bottom, the longitudinal center line of each ski boot being parallel to and substantially centered above the tilt axis of its step plate, and

means for indicating the direction and amount of any lateral tilting deviation between the frame and the top surface of each of the step plates.

2. A ski boot level indicating mechanism as claimed in claim 1 wherein the pivotal axes of both step plates being parallel.

3. A ski boot level indicating mechanism in accordance with claim 2 wherein means are provided on each step plate for longitudinally centering a ski boot thereon.

4. A ski boot level indicating mechanism as claimed in claim 3 wherein the means for indicating the direction and amount of lateral tilt include a pair of pointers fixed to pivot one with each of said step plates about the longitudinal axis thereof, each arm extending transversely to the longitudinal axis of its respective step plate, and a series of indicator points stationary relative to said frame and aligned with the arc of swing of each of said arms.

5. A ski boot level indicating mechanism in accordance with claim 4 wherein each of the points is an electrical contact point and an electric light is electrically connected thereto for illumination by its respective contact point.

6. A ski boot level indicating mechanism as claimed in claim 1 wherein the flat top surfaces of the step plates are spaced upwardly from the frame sufficiently that a pair of skis supported one longitudinally of each step plate will clear the frame.

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