Feb. 26, 1963 H. VON BOSIO 3,079,165

HEEL PLATE FOR A SKI BINDING

Filed Dec. 7, 1960

2 Sheets-Sheet 1

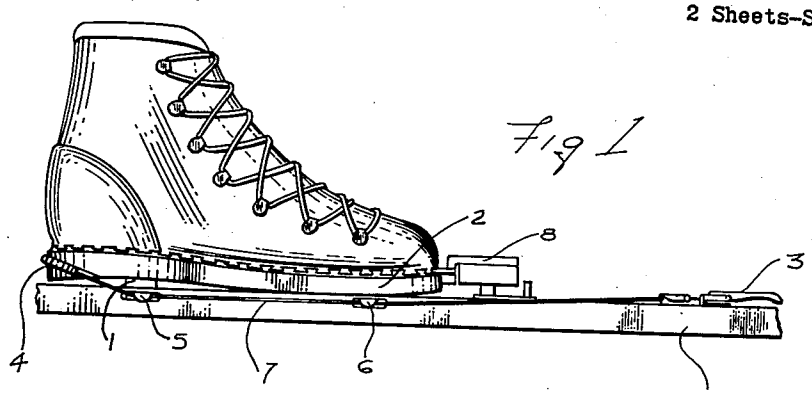

Fig 1

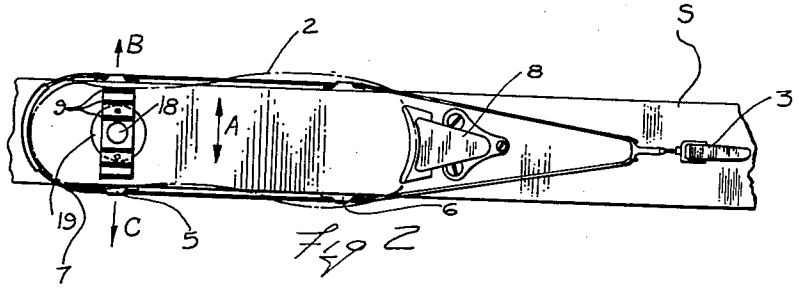

Fig 2

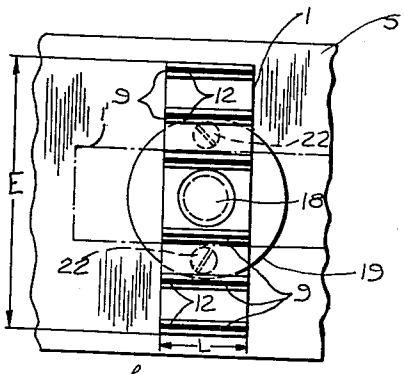

Fig 3

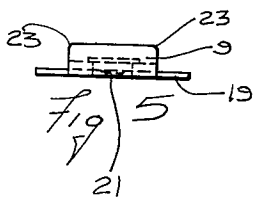

Fig 5

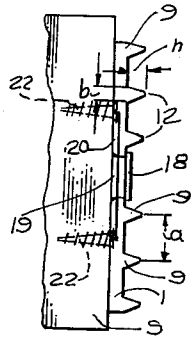

Fig 4

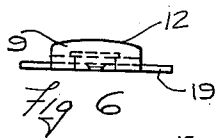

Fig 6

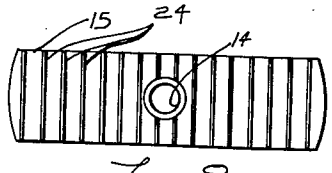

Fig 8

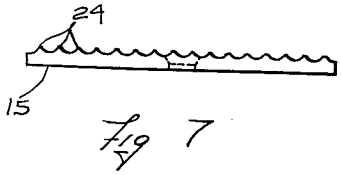

Fig 7

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Fig 9

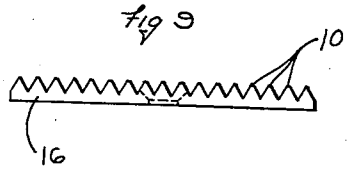


Fig 10

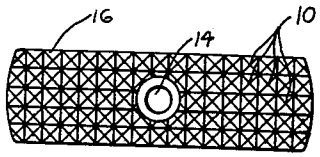


Fig 11

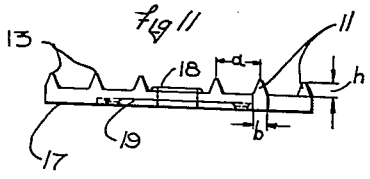


Fig 12

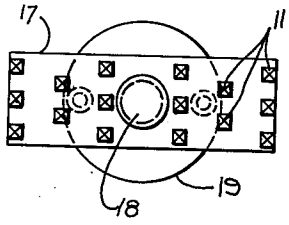


Fig 13

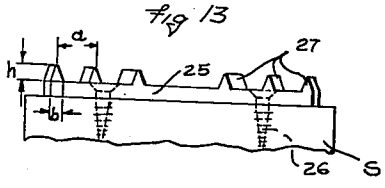
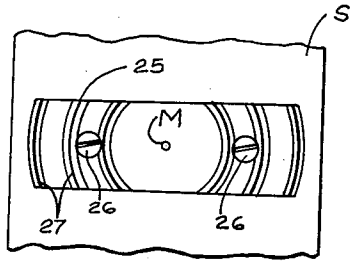


Fig 14



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3,079,165

HEEL PLATE FOR A SKI BINDING

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11 Claims. (Cl. 280—11.35)

In the known ski bindings comprising a cable binding running over the heel, a support or heel plate made of rubber or the like is generally arranged on the ski and this plate can be smoothed or serrated. When using these known support or heel plates, it is not possible to avoid a lateral movement of the heel on descent. In order to achieve a better lateral guiding of the heel, heel plates are known which comprise lateral cheeks. However, this design is complicated as regards manufacture and assembly, because the side cheeks must be arranged to be adjustable to the width of the heel actually fitted.

It is an object of the invention to provide a heel plate for skis without having to use these side cheeks, which prevents any lateral displacement of the heel on the ski on descent. For this purpose, according to the invention, a heel plate consisting of rigid material, such as for example metal or plastic, is provided with pointed protuberances which comprise a very small supporting surface for the boot heel in relation to the plate surface. In view of these small bearing surfaces, a very large specific surface pressure is set up by the weight of the skier and also the cable binding acting obliquely on the heel, so that the rubber surface of the heel is forced into the pointed protuberances. By this means, the heel is fixed, that is to say, any lateral movement thereof relative to the ski is prevented.

If the heel plate according to the invention is used in combination with a safety binding which permits the ski boot to be swung outwardly with an excessive torsional stress, the heel plate provided with the sharp or pointed protuberances is mounted to rotate about an axis perpendicular to the ski. Due to this rotatable arrangement of the new heel plate, the free outward swinging of the ski boot is assisted in the event of a dangerous fall.

Other details of the heel plate according to the invention will be more fully explained hereinafter by reference to the constructional example shown in the drawing, wherein:

FIG. 1 is a side elevation of a safety binding with a front cheek plate, a cable binding and a heel plate according to the invention,

FIG. 2 is the corresponding plan view,

FIG. 3 shows the heel plate according to FIGS. 1 and 2 in plan view and to natural scale.

FIG. 4 is the associated front elevation,

FIGS 5 and 6 are side elevations of different forms of this heel plate.

FIGS. 7 and 8 are a front elevation and plan view, respectively, of another construction of a heel plate,

FIGS. 9 and 10 are a front elevation and plan view, respectively, of yet another construction of a heel plate,

FIGS. 11 and 12 are a front elevation and plan view, respectively, of yet another form of heel plate,

FIGS. 13 and 14 are similar views of yet another constructional form.

FIGS.3 and 4 show a preferred constructional form of a heel plate 1 mounted on the ski S to pivot about a vertical axis. It is possible for the said plate 1 to be used with a safety binding shown in FIGS. 1 and 2. With such a binding the sole 2 of the ski boot is pressed against a front safety cheek plate 8 of any desired known construction by means of a cable binding. The cable binding 7 can be tightened by a tensioning device 3, and it runs over the

heel groove 4 and is guided by holding-down devices 5, 6. The said safety cheek plate permits the ski boot to swing in the direction of the arrow A in the event of an excessive turning moment. As will be seen from the drawing, the heel plate 1 is arranged beneath the ankle section. In order to prevent any lateral displacement of the heel in the direction B or C, the plate consisting of rigid material is formed with sharp protuberances. In the preferred embodiment as shown in FIGS. 2 to 4, these protuberances form wedge-shaped ribs 9, which are arranged approximately longitudinally of the ski and the peaks of which are spaced apart a distance *a*. Instead of having these ribs, the protuberances can consist of pyrimidal or conical protuberances 10 or 11, as shown in FIGS. 9 and 10 and FIGS. 11 and 12. According to FIG. 4, and also FIGS. 11 and 13, the height *h* of these protuberances is greater than their base *b*. It is apparent from FIGS. 3, 4 and 11 to 14 that the distance *a* is several times that of the base *b*. For example, with the construction shown in FIGS. 3 and 4, the base *b* can be about 3 mm., the height *h* about 4 to 5 mm. and the spacing *a* of the rib-like protuberances 9 about 1 cm. Due to these comparatively high, pointed protuberances arranged at relatively large intervals, a heel plate with exceptionally good gripping power is provided, which prevents any lateral displacement of the heel and which simultaneously has the advantage that relatively large gaps exist between the ribs 9 or points 11, in which snow or ice cannot become so lodged that the function of the heel plate is impaired.

As will furthermore be apparent from the drawing, the ribs 9 are not so pointed that they are knife-sharp, but rather comprise a blunt edge 12 in order to prevent any damage to the sole plate normally consisting of rubber. The points 11 are also blunted in the same manner, as indicated in FIG. 11 at 13. Nevertheless, as will be seen from the drawing, the protuberances on the heel plate are so pointed that only very small support surfaces 12 or 13 are formed in relation to the whole surface of the heel plate, so that these protuberances penetrate somewhat into the rubber sole of the boot and thus prevent any lateral movement.

In order to make possible a free swinging of the ski boot in the direction A on releasing the safety binding 8, the heel plates shown in FIGS. 3, 4, 7, 8, 9, 10 and 11, 12 are mounted on the ski so as to pivot about a vertical axis. For this purpose, a hole 14 for a fixing screw is provided in the heel plates shown in FIGS. 7 to 10, it being possible for the said heel plates 15 or 16 to rotate about the said screw. Referring to the embodiments shown in FIGS. 3 and 4 and FIGS. 11 and 12, the heel plates 1 and 17, respectively, are connected by a rivet 18 or the like to a base plate 19 which is to be fixed on the ski and which is arranged to be completely recessed, as illustrated, or partially recessed in a suitable depression 20 of the heel plate. In the construction illustrated (see FIGS. 3 and 4), the ends of the heel plate 1 are thus directly supported on the ski S.

As illustrated, the base plate 19 is formed as a cylindrical disc, the diameter of which is considerably smaller than the width E of the base plate. This fixing disc 19 also has a diameter larger than the length L of the heel plate, the projecting parts being formed with two diametrically opposed countersunk holes 21 for two countersunk screws 22. For fixing the heel plate 1, the plate is first of all rotated to a position extending longitudinally of the ski, as illustrated in FIG. 3 and indicated by chain-dotted lines 1', then the disc 19 is fixed on the ski by means of the screws 22 and finally the heel plate 1 is swung into its normal position, so that thereby the two fixing screws 22 are concealed.

It is further apparent from the drawing, that it is suffi-

cient to select a comparatively narrow heel plate, the length L of the heel plate being considerably smaller than the width E thereof, which corresponds substantially to the boot heel. This plate length L is only a fraction of the plate width E in the construction illustrated. In the embodiment shown in FIGS. 3 to 14, the length L is about ⅓ of the width E.

Where the protuberances are formed as ribs, as shown for example in FIGS. 3 and 4, it is advantageous to round off the corners of the ribs, as indicated at **23** in FIG. 5. If necessary, the upper edge **12** of these ribs can also be arcuately curved for the purpose of better adaptation to the sole of the boot, as indicated in FIG. 6.

Rib-like protuberances **24** are also provided in the constructional form according to FIGS. 7 and 8. The construction of the heel plate **16** shown in FIGS. 9 and 10 corresponds to the plate according to FIGS. 11 and 12, but the pyramidal or conical protuberances **10** are arranged at a smaller distance apart.

The heel plate according to the invention can if necessary also be arranged fast, i.e. not rotatably, on the ski. FIGS. 13 and 14 show embodiments which are especially suitable for this purpose. As regards the heel plate **25** according to FIGS. 13 and 14, this is fixed by means of screws **26** on the ski and comprises rib-like protuberances **27** which are arcuately curved about the center M of this plate as the center. On releasing the safety binding, therefore, the heel can be rotated on these arcuate edges **27**.

I claim:

1. For use with a ski having a safety ski binding mounted thereon, said ski binding having a front positioned means for engaging the toe of a ski boot and for releasing such engagement in response to excessive turning moment on the boot and means for urging the heel of the ski boot both downwardly and toward said front positioned means; a heel plate of rigid material mounted on the upper surface of the ski spaced from said front positioned means for engaging the heel of the ski boot, said heel plate having upstanding pointed protuberances for engaging the heel of the ski boot, the combined areas of the peaks of said protuberances being very small in comparison to the total surface area of said plate so that under the weight of the skier the protuberances penetrate into the heel of the ski boot to prevent lateral displacement thereof with respect to the ski; and pivot means extending vertically with respect to the upper surface of the ski and arranged on the lengthwise center line thereof and supporting said heel plate for swiveling movement with respect to said ski whereby the boot may be swivelled about an axis which extends upwardly through the heel of the boot in response to an excessive turning moment on the boot.

2. The structure of claim 1 in which the peaks of the protuberances project farther above said heel plate than any other portions thereof so that the ski boot is held against lateral displacement solely by said protuberances.

3. The structure of claim 1 including a base plate and means rigidly securing said base plate to the upper surface of the ski, said heel plate being disposed above said base plate and having a recess in its underside, said base plate being disposed in said recess so that said heel plate can swivel with respect thereto, said pivot means being secured to said base plate and extending upwardly therefrom for pivotal support of said heel plate.

4. The structure of claim 3, in which said base plate is at least partially circular in plan and has a diameter which is smaller than the width of the heel plate but which is larger than the length of the heel plate, said base plate having a pair of countersunk screw openings on opposite diametric sides of said pivot means, and a screw within each of said openings and screwable into said ski whereby said base plate is rigidly secured thereto; the width of said heel plate being approximately equal to the width of a ski boot heel and being considerably larger than the length of the heel plate.

5. For use with a ski having a safety ski binding mounted thereon, said ski binding having a front positioned means for engaging the toe of a ski boot and for releasing such engagement in response to excessive turning moment on the foot; a heel plate of rigid material mounted on the upper surface of the ski spaced from the front positioned means for engaging the heel of the ski boot, said heel plate having upstanding pointed protuberances for engaging the heel of the ski boot, the combined areas of the peaks of said protuberances being very small in comparison to the total surface area of the plate so that under the weight of the skier the protuberances penetrate into the heel of the ski boot to prevent lateral displacement thereof with respect to the ski; and means for supporting the heel of the ski boot so that it may be swiveled about an axis extending upwardly through said heel in response to an excessive turning moment on the boot.

6. For use with a ski having a safety ski binding mounted thereon, said ski binding having a front positioned means for engaging the toe of a ski boot and for releasing such engagement in response to excessive turning moment on the boot; a heel plate of rigid material rigidly mounted on the upper surface of the ski spaced from the front positioned means for engaging the heel of the ski boot, said heel plate having wedge-shaped, upstanding ribs for engaging the heel of the ski boot to prevent lateral displacement thereof with respect to the ski; the ribs being curved about the center of the heel plate so that the heel of the ski boot can pivot about said center, the width of said heel plate being approximately the same as the width of a ski boot heel and the length of said heel plate being considerably smaller than the width thereof.

7. Heel support structure, comprising:

an elongated, narrow, heel plate of rigid material, said heel plate having a plurality of parallel, wedge-shaped ribs extending upwardly from its upper surface, said ribs extending transverse to the longitudinal axis of said heel plate and being located on both sides of the center of said heel plate, said heel plate having a partially circular recess in its lower surface, the center of said recess being coincident with the center of said plate; a base plate disposed within said recess for swiveling movement therein, the lower surface of said base plate being substantially flush with the lower surface of said heel plate; and pivot means pivotally connecting said heel plate and said base plate.

8. For use with a ski having a safety ski binding mounted thereon, said ski binding having a front positioned means for engaging the toe of a ski boot and for releasing such engagement in response to excessive turning moment on the boot and means for urging the heel of the ski boot both downwardly and toward said front positioned means; a heel plate of rigid material mounted on the upper surface of the ski spaced from said front positioned means for engaging the heel of the ski boot, said heel plate having upstanding, elongated, wedge-shaped ribs which extend substantially longitudinally of the ski for engaging the heel of the ski boot and permitting same to be urged toward said front positioned means by said urging means whereby the ski boot is maintained in snug engagement with said front positioned means, the combined areas of the peaks of said ribs being very small in comparison with the total surface area of the heel plate so that under the weight of the skier the ribs penetrate into the heel of the ski boot to prevent lateral displacement thereof with respect to the ski; and pivot means extending vertically with respect to the upper surface of the ski and arranged on the lengthwise centerline thereof and supporting said heel plate for swiveling movement with respect to the ski whereby the boot may be swiveled about an axis which extends upwardly through the heel of the boot in response to an excessive turning moment on the boot.

9. The structure of claim 8, in which the front and rear longitudinal corners of the ribs are rounded.

10. The structure of claim 8, in which the ribs are

curved in the shape of an arch in the lengthwise direction thereof.

11. The structure of claim 8, in which the height of the ribs is greater than their width at the base thereof.

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