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[31] **P 18 03 997.9**

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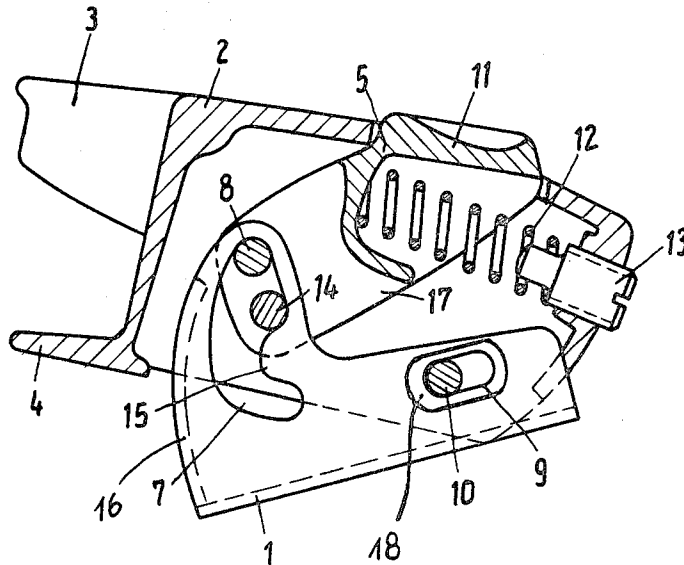
[54] **RELEASING HEEL RETAINER FOR SKI BINDING**
10 Claims, 4 Drawing Figs.

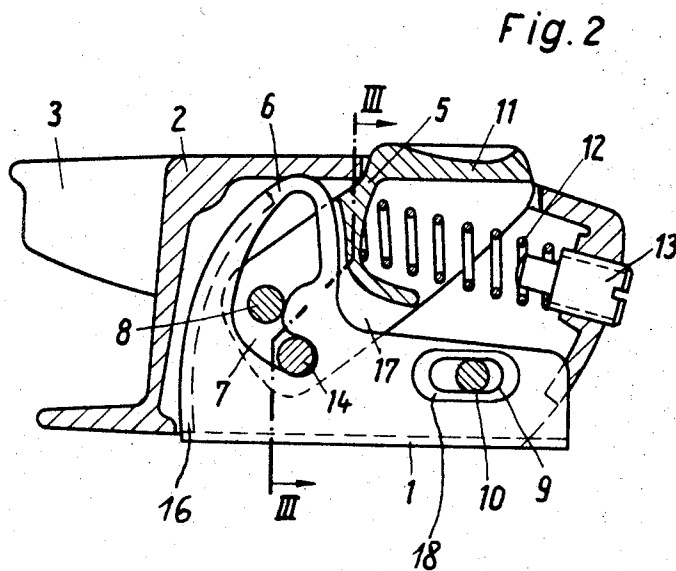
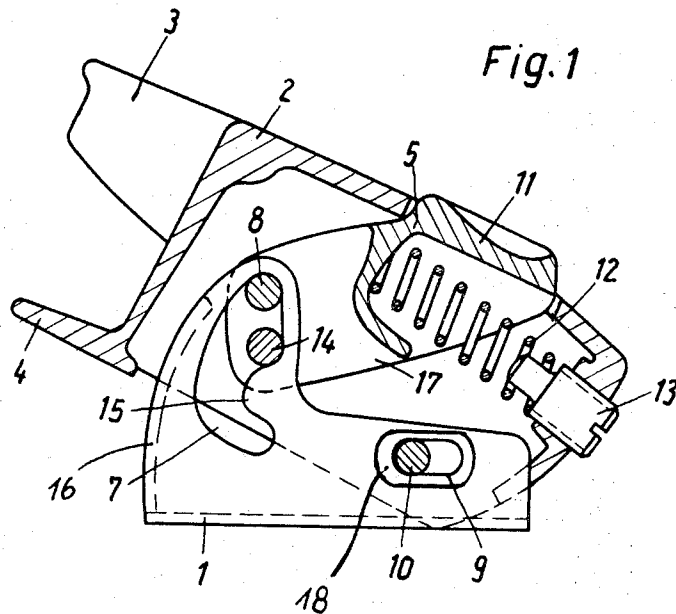
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 (HA)

ABSTRACT: A releasable heel retainer for ski binding that is rockable about an axis extending transversely of a fixed base that is disposed longitudinally of the ski which has a linked joint between the release means and the housing of the sole retainer and where the rearward end of the housing is slidably guided on the base where it is also pivotally linked and protected against rising from the base and which furthermore has a spring biased releasable latch that fixes the heel retainer in open position and where the front linkage or joint of the heel retainer is a sliding joint on the base part, whereby the housing that carries the sole-retaining part is guided by means of sliding members such as bolts, pins or projections in slots on the base.





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Fig. 3

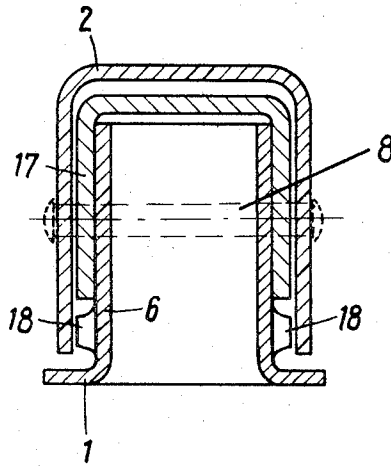
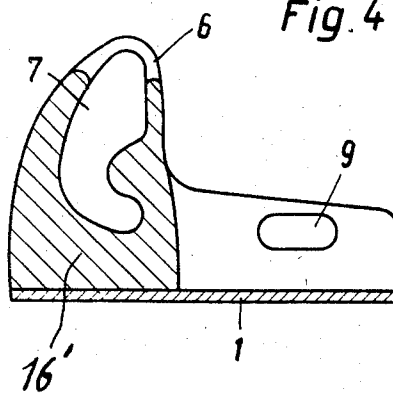


Fig. 4



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RELEASING HEEL RETAINER FOR SKI BINDING

BACKGROUND OF THE INVENTION

The invention relates to heel holders or retainers for ski bindings. More in particular, the invention is concerned with a releasable heel retainer for a ski binding which is pivotably movable relative to a base member about an axis that extends transversely with respect to the length of the ski, while simultaneously a joint connection exists between the releasing means and the housing of the sole retainer. In this environment, preferably the rearward housing end is displaceably or slidably guided in the direction longitudinally of the ski on the base member that is fixed to the ski where it is simultaneously pivotally connected and secured against rising from the base member. Furthermore, a latching arrangement is provided which is releasable against the biasing action of a spring and which fixes the heel retainer in the open position.

Heel retainers of this type have fully and satisfactorily proven themselves in operation. However, they require considerable structural expenditure, especially for fixing the releasing position and for the reengaging in retaining position. It is, therefore, an object of the invention to structurally simplify such a retainer while maintaining its functional advantages and thus decrease the production costs.

SUMMARY OF THE INVENTION

In order to solve this problem, the invention proposes to construct the front connection or linkage of the heel retainer at the base as a sliding link or joint, while the housing that carries the component holding down the sole is guided by way of sliding elements such as bolts, pins, or projections into slots of the base part. These slots extend preferably in arcuate form perpendicularly or at an angle upwardly with respect to the base element. This results in a decrease of the components necessary for the linkage and movement of the housing because the housing is now guided directly by way of the sliding means in slots of the base component. On the basis of this simple form of construction, the tool and production costs are small so that this retainer is suitable particularly for bindings for children. Advantageously, the housing assumes a relatively large open angle with the surface of the ski while in open position, because it is pivotally movable upwardly throughout the entire link-guiding slot means. In spite of this large opening angle (also referred to as mouth width) the retaining component that engages the sole can be fixedly provided on the housing and the structural height of the entire retainer can be made relatively small. Also the advantages of latching in the release position, as well as the possibility of establishing from the release position of the housing the retaining position automatically by stepping down on the housing are retained, or are realized with very simple means. A further advantage resides in that the invention readily permits closure of the base component at the front end so that no snow can enter there. This happens to be one of the disadvantages in known sole retainers, especially in the open position.

In accordance with a preferred embodiment of the invention, the slot-guiding means in the base is designed simultaneously as a latch for fixing or setting the release position, or the snapping out of this position into the holding or retaining position, and it collaborates with a latch pin of the release lever.

BRIEF DESCRIPTION OF THE DRAWINGS

Further features and advantages of the invention will become apparent from the following description of an embodiment illustrated in the drawings in which:

FIG. 1 is a sole retainer constructed in accordance with the invention in open position, particularly in section;

FIG. 2 is a view in accordance with FIG. 1, but in the retaining position with parts omitted that are of no interest here;

FIG. 3 is a cross section taken along line III-III in FIG. 2 also with unnecessary parts omitted; and

FIG. 4 is a further modification of the invention in longitudinal section with a component that simultaneously constitutes guide means and front wall, and the base.

DESCRIPTION OF THE INVENTION

The heel retainer in accordance with the invention comprises the base 1, the housing 2 with the retaining part 3 and the stepping plate 4, as well as the release lever 5. As reflected by FIG. 4, the base portion 1 in this embodiment is provided with two side cheeks 6 which extend perpendicularly upwardly and longitudinally with respect to the ski, and in which two guide slots 7 are provided. The base part proper is either fixed to the ski or resiliently supported on the ski surface in longitudinal direction of the ski. Into the guiding slots 7 which could also be provided in a different manner on the base member, there extends a sliding element which here is in the form of a horizontal bolt 8 that extends transversely with respect to the longitude of the ski and which extends through the housing 2. Preferably the bolt 8 serves also simultaneously for linking the release lever 5 to the housing. The sliding means could also be in the form of a pin, a projection or the like.

As shown in the drawings, the guiding slots 7 are preferably arcuately shaped and extend either perpendicularly or at an angle upwardly with respect to the base.

In addition to the sliding linkage or joint connection explained above between housing and base, there is also a rearward likewise sliding connection in the form of substantially horizontal slots 9 in the side cheeks, in which the rearward part of the housing is slidably guided by means of the pin 10, longitudinally of the ski, and about which pins it is rockable (see FIGS. 1 and 2). The slots 9, however, prevent the rearward end of the housing from rising up from the base element.

Also here, a latching means that is releasable against spring bias and that fixes the open position of the retainer is provided which is preferably constituted by the guiding slot 7 proper. In accordance with the exemplary embodiment, the arrangement for this may be as follows: The release lever 5 is double armed, while the bolt 8 serves as a pivot axis which also has the same function in applicant's prior U.S. Pat. No. 3,473,816 i.e., the linking between the rocker or the release lever on the one hand and the housing on the other hand. The compression spring 12 acts upon the operating arm of the lever which is at the top in the drawing, and which has a surface 11 for placement of the point of the ski pole. The compression of the spring can be changed in a known manner by means of a setting screw 13. This heel retainer thus operates with a single pressure spring. The other lever arm constitutes the locking arm on it. There is provided a latch pin or the like 14 which is likewise guided in the slots 7 of the sidewalls 6. The rearward wall of the slot 7 has a forwardly directed component or projection 15 by way of which the pin or the like 14 moves against the effect of the spring 12 either by snapping into the released position (FIG. 1) or into operating or latched position (FIG. 2). In this connection, the space between parts 8 and 14, i.e., the effective length of the latch or locking arm of the release lever is somewhat smaller than the space required by the projection 15. As a result, bolt 8 in the retaining position is approximately in the center area of the projection 15 and, under suitable pressure upon the release lever, it slides into the position illustrated in FIG. 1.

It is evident that in response to excess upward pressure of the ski boot on the sole-depressing part 3, or with manual pressure or by pressure of the ski pole tip onto the surface 11 of the lever, the device moves from the retaining position (FIG. 2) into release position. For this action the release lever 5 rocks about the bolt 8 against the force of the spring 12 and the catch pin 14 slides around the projection 15. In both positions however, the spring 12 provides for the safe engagement of the pin 14 in the particular recess in the rear wall of the guide slot. Thus the spring imparts to the pin 14 a clearly defined position above or below the projection or lug

The shape of the guiding slot, particularly its rear wall need not be designed only for the latching effect described. It may also be selected in such a manner that by suitable dimensioning of the release lever, its actuating surface 11 is substantially aligned or flush with the top side of the housing in the retaining or latching position as well as in the released position, while the lever is held in this position automatically by the spring 12. This prevents in both positions the entrance of snow into the top side of the housing.

The return of the sole retainer from the release position (FIG. 1) into the operative position (FIG. 2) is effected by stepping down on the step plate 4, while the pin 14 moves around the lug 15 as the lever 5 is rocked and spring 12 depressed and finally the parts attain the position shown in FIG. 2. To this end it is advantageous to form the top side of the lug 15 as an oblique sliding surface.

The arrangement in accordance with the invention provides the further advantage that the release movement of the sole retainer can be very accurately defined or controlled. In addition to this there is the advantage that the housing including the sole retainer part can resiliently yield rearwardly in the guiding slot 9.

Furthermore the invention makes it possible to close the base part at its forward end, for example, by an end wall 16 which connects the two side jaws 6. Thus the base part forms a substantially box-shaped assembly component which is only open at the top. Upon sliding on the housing which, with the exception of the passage aperture for the surface 11 is closed and is also closed at its bottom side, snow may no longer penetrate into the interior of the retainer. Here it is of special significance that the housing can be completely closed up at its front end because, during skiing, due to the travelling pressure snow and ice crystals are flung against and into the binding especially from this end. In accordance with a preferred embodiment of the invention this front wall, together with the part that constitutes the slotted guide may be formed as a unitary component, for example out of plastic. This part is identified at 16' in FIG. 4 and is retained between the lateral cheeks by gluing or riveting. By this means the relatively expensive chip removal work at the guide slots is eliminated which is required when the part is made of metal. Moreover, a guiding slot member made of plastic has better sliding characteristics and beyond that, it is highly wear resistant.

In accordance with the embodiment the release lever 5 may be so formed that flat sheet metal sidewalls 17 or the like extend on both sides from the surface 11 which form the longer arm of this lever and extend each into a gap between the inner wall of the housing and the outer surface of the sidewalls (FIG. 3). The bolt 8 extends rotatably through the sidewalls.

The sidewalls are also the supports for the latch elements 14. In this connection it is desirable for the sidewalls 17 to fill the space between housing and lateral cheeks 6 of the base part rather well so that no harmful play will develop between elements 2 and 6. For this purpose each of the lateral cheeks 6 may also be provided in their rearward lower region with a bulge 18 in which the slots 9 are accommodated. Thereby the housing 2 is safely guided there and supported against lateral displacement.

Having now described the invention with reference to the embodiment illustrated, what I desire to protect by letters patent is set forth in the appended claims.

I claim:

1. Releasable heel retainer for ski binding comprising a

stationary base member, a housing presenting a sole-holding member at its forward end, a release and latching lever disposed intermediate said base member and said housing, and linking joint means arranged proximate the forward end of said base member intermediate said release and latching lever and said housing, said linking joint means being a sliding joint defined by arcuate slots in said base member and sliding members, said sliding members projecting into said slots from said housing through said release and latching lever and defining a pivot for said lever, latching elements adjacent said sliding members projecting from said release and latching lever into said arcuate slot to latch said housing in the released position and in the heel-retaining position, and a sliding joint means including a horizontal slot and a sliding element adjacent the rearward end of said base permitting sliding movement of said housing end longitudinally of said base, but preventing raising of the housing end from said base.

2. Heel retainer as set forth in claim 1, where said base member has two upwardly extending cheeks and arcuate slots are defined in said cheeks and extend upwardly from said base.

3. Heel retainer in accordance with claim 1, where said sliding members are defined by a bolt which serves simultaneously as a link joint between said release and latching lever and said housing.

4. Heel retainer in accordance with claim 3 where said release and latching lever is a two-armed lever having one arm pivotable about said bolt extending into said housing and having an actuating member extending from said housing at one end and having a latching arm at the end opposite from said actuating member where said latching elements are located, and where the walls of said slots engaged by said latching elements present projections defining lugs over which said latching elements move prior to reaching their latching positions, and a spring extending between the end of said housing opposite the end having said sole-holding member and said release and latching lever biasing said sliding members and said latching members into engagement with said slots.

5. Heel retainer in accordance with claim 4, where the space between said sliding members of said housing and the latching members of said release and latching lever is smaller than the space occupied by the base of said lug in the height of said slot.

6. Heel retainer in accordance with claim 5, where said base member has a transversely extending covering wall portion at its forward end and the end of said housing having said sole-holding member extends over said base member.

7. Heel retainer in accordance with claim 6, where said covering wall portion extends between said upwardly extending cheeks of said base member.

8. Heel retainer in accordance with claim 7, where said covering wall portion and said cheeks defining said slots form a molded unit with said base.

9. Heel retainer in accordance with claim 8, where the end of said lever projecting from said housing presents a surface for engagement by a ski pole, and said slots, said sliding and said latching members are so proportioned that said surface is substantially in alignment with the top of said housing.

10. Heel retainer in accordance with claim 9, where said lever has two flat side portions which define lever arms each of which extends into a space between the inner wall of said housing and the outer wall of one said cheek and which simultaneously support said sliding and said latching members.