

Sept. 16, 1969

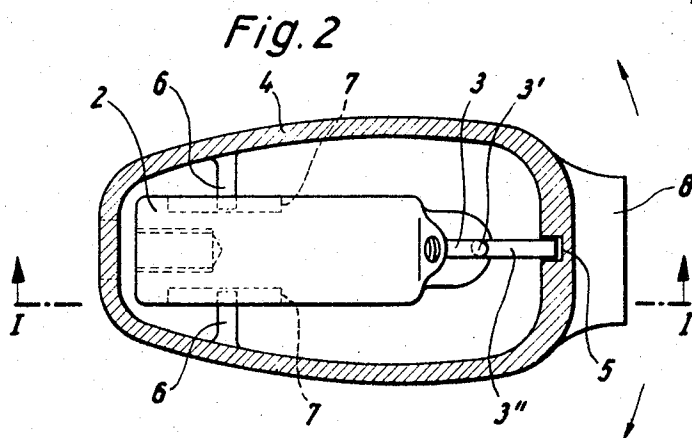
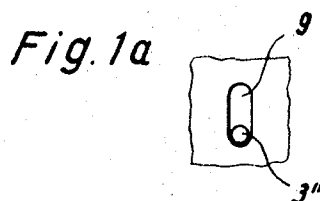
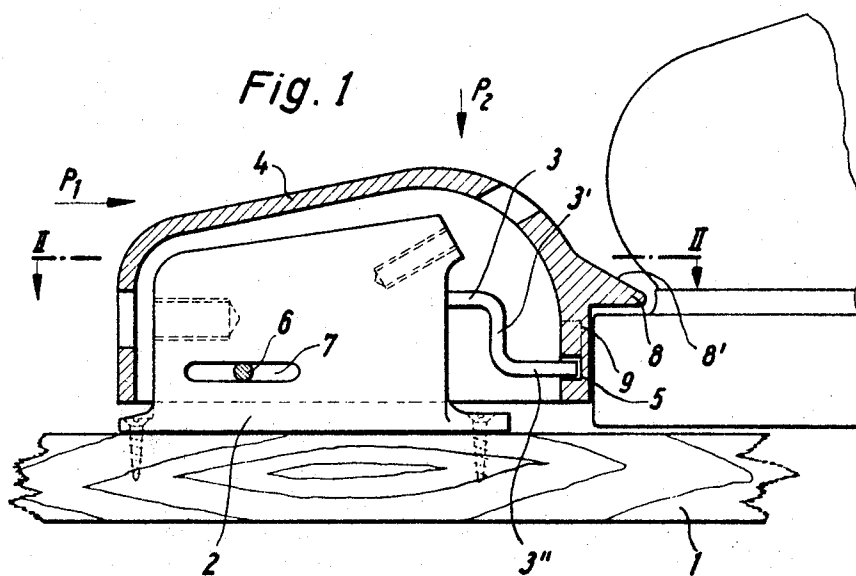
P. UNGER

3,467,407

SAFETY BINDING WITH DOUBLE CRANK MEANS

Filed Aug. 23, 1967.

2 Sheets-Sheet 1



Inventor:
PAUL UNGER
BY *Robert J. Jacob*
AGT.

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P. UNGER

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Fig. 5

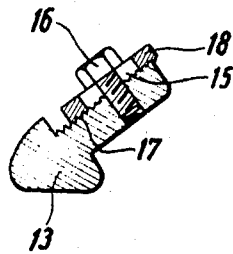


Fig. 3

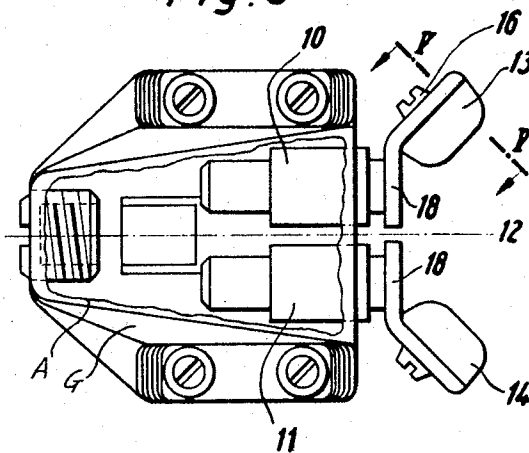
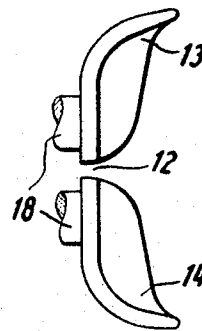


Fig. 4



Inventor:
PAUL UNGER
BY *Robert H. Guot*
AGT.

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3,467,407

SAFETY BINDING WITH DOUBLE CRANK MEANS

Paul Unger, 1 Zirndorfer Weg, 8501 Altenberg, near Nuremberg, Germany

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Int. Cl. A63c 9/08

U.S. Cl. 280—11.35

7 Claims

ABSTRACT OF THE DISCLOSURE

Safety binding for skis where the boot latch is linked to the pressure member of the release device for movement of the boot latch with the pressure member longitudinally of the ski and for pivotal movement of the pressure member laterally.

Background of the invention

The present invention relates to safety bindings for skis. More in particular, the invention concerns safety bindings which are provided with means which effect release of the foot in the event of a forward fall, as well as with lateral or torsion falls which is actuated by the sole retainer against the effect of a spring and in which connection the forward fall release is effected by the longitudinal displacement of a pressure element. In applicant's U.S. Patent 3,194,573 the release is so arranged that in the event of torsion falls the pressure member is pivotable about an axis that extends longitudinally of the ski, whereby the point of contact of the force applied by the pressure member against the boot is outside of the aforementioned axis.

In accordance with a further development of applicant's earlier disclosure, the sole retainer or boot latch is provided directly on the pressure member or an offset or crank shaped portion of this component. Inasmuch as the sole holder is swung to the side, as well as upwardly in the event of a torsion release, although it should maintain its horizontal position, it must be pivotally disposed on the pressure member. This pivotal mounting means, for example a rivet, involves the disadvantage that the sole retainer is inevitably rocked with respect to the pressure member, so that as a rule it must first be manually moved into horizontal position before the ski boot can be inserted. Besides, the rotary or rivet connection of the sole retainer with the pressure member must be somewhat loose for the aforementioned reasons, while a rigid, stable mounting of the sole holder is desirable.

While in accordance with the invention the principles of applicant's earlier disclosure are to be maintained, the loose or rotatable joining of the sole holder is to be avoided. In addition, the invention provides for use of this type of binding also with automatic heel release means that engage the heel of the ski boot.

In accordance with the invention, it is proposed that part of the binding which is provided with the release mechanism and the pressure member are encompassed by a housing or casing which is connected with the part or end of the pressure member that is disposed away from the pivot axis for pivotal or rotatable movement, and also in a manner to be carried along, that furthermore between the binding part and the housing a connection is provided which makes possible swinging of the housing at least horizontally, and that the sole retainer is mounted firmly on the housing. The sole retainer is either formed as unitary part of the housing, for example it may be cast as a unit therewith, or by

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injection molding in plastic form, or it may be mounted rigidly on the housing by means of a threaded connection, or the like. In this manner, the aforementioned shortcomings of a loose or pivotable mounting of the sole retainer or holder are avoided. In addition, the aforementioned binding component, including the projecting end of the pressure member, is fully enclosed by the housing which provides the further advantage that the release mechanism is also protected against the effect of snow and ice.

The joint or pivot connections of the housing with the pressure member and the binding make it possible that the housing follows all the movements of the pressure member in the event of torsion or forward falls, and that the sole retainer maintains its horizontal position in any position of the housing.

The problem of a rigid connection of the sole retainer with the pressure member, or with an offset portion thereof can also be solved in accordance with the invention in a different manner, i.e. in that symmetrically with respect to the center longitudinal axis of the binding two pressure members are disposed parallel to one another, with a sole retainer securely mounted on each of these pressure members.

The binding in accordance with applicant's Patent No. 3,194,573, as well as the improved modifications set forth above may, in accordance with the invention, be also applied to an automatic heel release which engages the sole of the boot at the heel and presses against the ski, but which releases as a certain adjustable pressure is applied (torsion or forward falls) and frees the ski boot.

Further objects and advantages of the invention will become apparent from the following description with reference to the embodiments illustrated in the drawings in which

FIG. 1 shows a longitudinal section of a first embodiment taken along the line I—I of FIG. 2,

FIG. 1a is a partial view showing a modification of the connection of the pressure member on the housing, FIG. 2 is a cross-section taken along line II—II in FIG. 1,

FIG. 3 is a top view of a further embodiment of the invention, where the upper part of the housing has been omitted,

FIG. 4 is a partial front view of the sole holder of the embodiment in accordance with FIG. 3, and

FIG. 5 is a sectional view taken along line V—V in FIG. 3.

In the embodiment of FIGS. 1, 2 a binding component 2 which incorporates the release mechanism is threaded onto the ski 1 which mechanism has a pressure member 3 with an offset crank-like end 3' that projects from the housing of the binding component 2. With respect to the manner of operation and the different possibilities of structural form of such a binding and the release means therefore, reference is made to applicant's Patent No. 3,194,573 in order to avoid repetition. This applies also to the embodiment in accordance with FIGS. 3—5.

In accordance with the invention a housing 4 is provided which is pivotally or rotatably connected with the crank or offset end 3' of the pressure member 3. Furthermore, the housing is also pivotally connected with the binding component 2 or the casing thereof. The offset or crank section 3' for this purpose may have a further projection, a stud or a further offset or crank portion 3'', and engage therewith a support or bearing configuration in the interior of the housing. This pressure member 3 with its crank portions 3', 3'' may be produced by bending a piece of wire of sufficient strength. A bore 5 (see FIGS. 1 and 2) may serve as the bearing configuration. The housing 4 may be provided with pins 6 defining lat-

eral pivot axes, which are slidably guided in horizontal slots 7 or the like provided in the binding component 2 or in its casing. Instead the guide slot means may also be provided in the housing and the slidable lateral pivot axes or pins in the binding component 2 or in the casing thereof. In this manner the housing 4 can be displaced or is slidable longitudinally of the ski in the event of a forward fall, and in the event of a torsion or lateral fall it is pivotally movable in a horizontal plane (see arrows in FIG. 2) and in that event is also pivotally movable about the axis of the pins 6, while the housing rises and moves also in accordance with the crank portion 3". It is apparent that for each of these movements of the housing the projecting portion 8 that constitutes the sole retainer remains in horizontal position. In accordance with the embodiment of FIGS. 1 and 2 this projecting portion may be unitary with the housing 4. It would, however, be possible to provide a separate sole retainer (see FIGS. 3-5) which preferably is threadedly mounted on the housing and in a manner to be adjustable as to height. Since the crank end of the pressure member 3 and the housing 4 are connected for interaction, any force of pressure or rocking of the ski boot is also transferred to the pressure member in the same manner as disclosed in U.S. Patent No. 3,194,573.

The support on the inside of the housing may also be in the form of a vertical slot 9, as indicated in dot and dash lines in FIG. 1. Thus, in the event of lateral moving of the pressure member (torsion fall), the crank portions 3', 3" can move upwardly in this slot so that the housing 4 is not raised at its end that supports the sole retainer 8. In that event the connection 6, 7 may be such that it merely permits a displacement and pivotal movement of the housing 4 in a horizontal plane.

The handling or manipulating of such a binding is also very simple. After a torsion fall it is merely necessary to step with the ski boot on the top of the housing (see arrow P2 in FIG. 1), whereby the pressure member is forced to return to its locking or latched position. This is simpler and requires less effort than the pivotal movement of the relatively short crank portion of the pressure member by hand. After a forward fall the housing 4 merely needs to be pulled back into position manually (arrow P1). In accordance with applicant's aforementioned patent, the force required for this is very small.

If this binding is used on an automatic heel release, it is advisable to provide an inclined or oblique surface 8' on the top of the sole retainer or rollers on the boot latch or sole retainer (not illustrated). In this manner it is readily possible to press the heel of the ski boot from the top into the binding, whereby the housing 4 moves aside longitudinally of the ski against the effect of the pressure spring in the binding component 2. The sliding of the ski boot out of the binding in the event of a forward or torsion fall may also be facilitated by a suitable oblique surface on the sole retainer or by slide rollers.

The arrangement in accordance with FIGS. 1 and 2 also makes it possible to construct the casing of the binding component 2 in two parts, in which event the horizontally extending parting plane coincides with the center axis of the pressure member. This facilitates the production and the assembly in that the pressure member is first placed in the corresponding support of the bottom part, and thereupon the upper part can be placed on top and connected with the lower part (not illustrated).

FIG. 3 illustrates schematically in a top view a further embodiment with two pressure members 10, 11 constructed in accordance with the teaching of U.S. Patent No. 3,194,573, which are disposed symmetrically and parallel with respect to the center line 12. The housing G is shown with a cut-out A in order to expose the pressure members. A sole retainer 13, 14 is securely fastened to each of these pressure members. As shown in FIG. 5 the boot latch is adjustable in height in that toothed interengaging surfaces are provided between the offset portion 18 of the

pressure member which is provided with a guiding slot 15 through which extends a screw 16, whereby the boot latch may be secured in position. This form of construction may also be used in combination with the housing shown in FIGS. 1 and 2.

In the event of a forward fall both pressure members 10, 11 move aside forwardly, while in the event of a torsion fall the pressure member that is in the path of the direction of the boot swings upwardly and laterally.

This type of binding may also be used as an automatic heel binding which is provided with the aforementioned oblique surfaces or rollers. Besides that, the ski boot with this dual arrangement of the pressure members may be especially easily inserted if the upper surfaces of the sole retainer are not only inclined forwardly but also in the direction of the center axis. In this manner the pressure members move aside as the ski boot is pressed in not only in the longitudinal direction of the ski but also laterally.

It is furthermore possible in connection with both embodiments to provide a suitably large spherical configuration for the latch against torsional fall, so that the pressure member after moving aside returns automatically to its initial position, i.e., the retaining position, in response to the pressure from the spherical member.

Having now described my invention with reference to the embodiments illustrated in the drawings, I do not wish to be limited thereto, but what I desire to protect by Letters Patent of the United States is set forth in the appended claims.

I claim:

1. Safety binding for skis of the type including release means having a spring biased pressure member operative to release the boot, which release means during a forward fall is actuated by the boot latch moving said pressure member longitudinally of the ski against the pressure of a biasing spring and during a torsion fall moving said pressure member pivotally about an axis extending longitudinally of the ski, said pressure member extending from said release means and having an offset crank portion, a housing encasing said release means and said crank portion and having an interior bearing configuration for engagement by said crank portion, said housing including a boot latch on the exterior thereof proximate said bearing configuration, and means defining slidable, lateral pivot axes extending between the walls of said housing and said release means proximate the end of the housing and of the release means remote from said bearing configuration permitting horizontal pivotal movement of said housing.

2. Safety binding in accordance with claim 1, where said lateral pivot axes are defined by horizontally extending slots and pins extending into said slots.

3. Safety binding in accordance with claim 2, where said bearing configuration is a vertical slot engaged by said crank portion.

4. Safety binding for skis of the type including heel release means including a spring biased pressure member operative to release the boot, which release means during a forward fall is actuated by the boot latch moving said pressure member longitudinally of the ski against the pressure of a biasing spring and during a torsion fall moving said pressure member pivotally about an axis extending longitudinally of the ski, said binding comprising a pair of release means including pressure members disposed parallel to the center axis of the binding and a separate boot latch mounted on a laterally extending arm endwise of each pressure member.

5. Safety binding in accordance with claim 4, where said boot latch presents a top surface inclined downwardly in the direction away from the release means.

6. Safety binding in accordance with claim 4 where said boot latches present inwardly and downwardly inclined top surfaces extending away from the pressure members.

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7. Safety binding in accordance with claim 4 where the top of said boot latch is provided with slide rollers.

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BENJAMIN HERSH, Primary Examiner

10 J. A. PARKER, Assistant Examiner