June 6, 1972 H. WUNDER 3,667,769

SAFETY SKI BINDING

Filed Jan. 15, 1970

FIG. 1

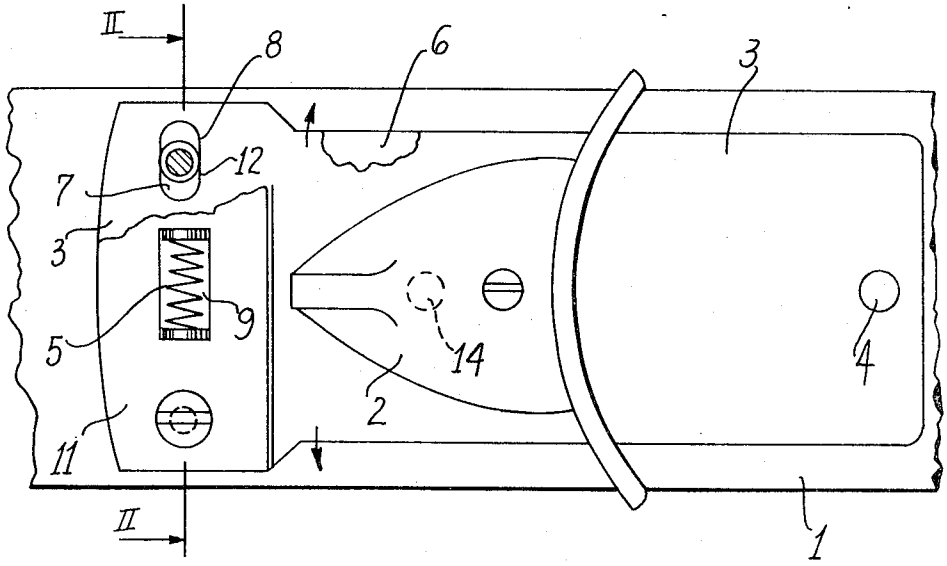


FIG. 2

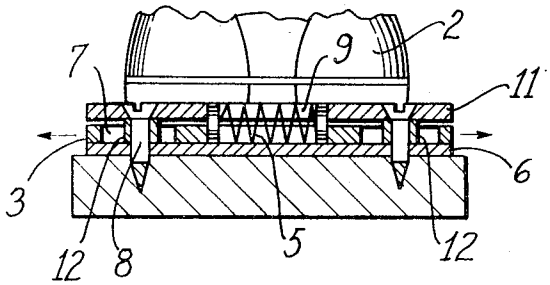
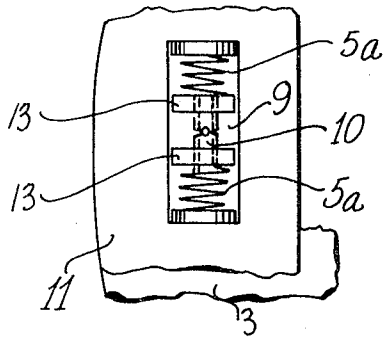


FIG. 3



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SAFETY SKI BINDING

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ABSTRACT OF THE DISCLOSURE

At last one boot-engaging portion, i.e. a heel-and/or toe-engaging portion, is mountable on a ski for pivotal movement under the influence of a predetermined torsional force about an upright axis from a normal operating position in which it connects the boot with the ski, to a laterally displaced release position in which it disconnects the boot from the ski. Mounting means mounts the boot-engaging portion for pivotal movement short of the release position in response to torsional forces smaller than the predetermined torsional force.

BACKGROUND OF THE INVENTION

The present invention relates generally to safety ski bindings, and more particularly to improvements in such bindings.

Safety ski bindings operate generally on the principle that laterally acting torsional forces which operate between the ski and the boot trigger release of the safety binding if they exceed a predetermined and frequently adjustable value, so that the ski thus becomes disconnected from the boot. However, it is of course well known that in actual operation there is a constant exertion of laterally acting torsional forces on the connection between the ski and the boot, but forces which are not large enough to trigger release of the safety binding. Under the influence of these forces, the toe or heel boot-engaging portion of the safety binding performs lateral movements of greater or lesser extent in the same manner in which it would perform such a movement as it pivots to release position, but of course the movements terminate before release position can be reached.

Evidently, each time the engaging portion performs such a movement, which may be considered a partial release movement, it is intended to return to normal position to provide for proper alignment of the boot and ski. Depending upon the extent to which the engaging portion has moved laterally, the return to normal position requires the exertion of more or less force, and the force required is the greater the closer the engaging portion has moved to the point at which the binding will be triggered and then cause the release of ski and boot. It is hardly necessary to emphasize that the forces which act upon the boot as a result of this are quite significant because the boot of course is pressed with considerable force against the engaging portion. Evidently, this is undesirable. A further problem is that on occasion it even occurs that when the engaging portion has moved to such a partial release position, it will not return to its normal position.

SUMMARY OF THE INVENTION

It is, accordingly, an object of the present invention to provide a ski binding which is not possessed of the aforementioned disadvantage.

More particularly, it is an object of the present invention to provide a safety ski binding wherein the aforementioned disadvantage is avoided.

In pursuance of the above objects, and others which

will become apparent hereafter, the invention resides, briefly stated, in a safety ski binding which cmoprises at least one boot-engaging portion mountable on a ski for pivotal movement under the influence of a predetermined torsional force about an upright axis from a normal operating position in which it connects a boot with the ski, to a laterally displaced release position in which it disconnects the boot from the ski. Mounting means mounts the boot-engaging portion for pivotal movement short of the release position in response to torsional forces smaller than the predetermined torsional force.

First, the movement of the engaging portion from its normal boot-engaging or boot-holding position to release position is subdivided into two independent motions, namely an initial motion and a subsequent or release motion. The initial motions—which of course are frequent as mentioned above—may take place at substantially unvarying contact pressure between the boot and the engaging portion without any danger of jamming of the motion of the engaging portion which could prevent or retard the return of the engaging portion to its normal position.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top-plan view in fragmentary illustration, showing a ski with the novel binding mounted thereon;

FIG. 2 is a section on line II—II of FIG. 1; and

FIG. 3 is a fragmentary plan view illustrating a further embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Discussion now the drawing in detail, and firstly the embodiment illustrated in FIGS. 1 and 2, it will be seen that reference numeral 1 identifies a fragmentarily illustrated ski which may be of any type whatsoever. Mounted on the ski overlying a portion of its upper surface is a support plate 6 which is well known in conjunction with the ski bindings. This is shown in FIG. 2.

According to the present invention, I mount on the support plate 6 a pivotable plate 3 which is pivotable about the upright axis defined by a pin or analogous means 4. Thus, the plate 3 can pivot to either of the two lateral sides of the ski 1, as suggested by the arrows in FIGS. 1 and 2. The plate 3 has securely mounted thereon the boot-engaging portion 2 which is similarly pivotable in lateral direction about the upright axis 14. It should be noted that the boot-engaging portion 2 may be a heel-engaging portion or a toe-engaging portion. It should be further noted that the axis defined by the pin or analogous means 4 is spaced from the portion 2 and that the farther this spacing is, the closer will be the approximation of the turning radius of the plate 3 to the turning radius of the boot sole about that end of the sole about which the boot turns. In other words, the illustrated engaging portion 2 is shown for instance as a toe-engaging portion and the pin defining the axis 4 is offset from the portion 2 in direction towards the heel of the boot, with any lateral movement of the boot sole occurring with respect to a turning axis which must be thought to extend in upright direction through the heel of the boot.

As illustrated, the plate 3 is maintained in its normal centered or rest position by elastically yieldable means. This is shown in the drawing in form of a spring 5, but

the spring may be replaced by a member of elastomeric material, or by analogous means. A stationary cover portion **11** is provided which is formed with a cut-out **9** extending transversely of the elongation of the ski **1**, and the opposite ends of the spring **5** or the analogous means abut against the opposite ends of the cut-out **9**. A similar cut-out is provided in the plate **3**, as evident from FIG. 2.

Screws **8** secure the cover portion **11** to the ski and are provided with sleeves **12** which surround a portion of the respective screw **8** and which serve as abutments in the elongated slots **7** provided in the plate **3**. At the upper left-hand corner of FIG. 1 the cover portion **11** is broken away to show one of these slots **7** in top-plan view. Thus, the maximum lateral pivotal movement of the plate **3** is determined by the distance between that end of the respective slot which will abut against the screws when the plate performs a lateral movement, and the screws themselves.

Whenever the plate **3** performs such a lateral movement it will be elastically contacted by the spring **5** and the movement will terminate when the aforementioned abutment between the ends of the slots **7** and the respective screws **8**—or rather their sleeves **12**—occurs. Subsequently, the spring **5** will assist return of the plate and thereby the boot-engaging portion **2** to the normal or centered position. A release of the safety ski binding will occur only if the force effecting such lateral movement is so great as to trigger the binding subsequent to the occurrence of the abutment between the sleeves **12** and the ends of the slots **7**. Details concerning the actual mechanism of the safety ski binding have been omitted because they are well known and because the mechanism of the binding itself does not form a part of the present invention. Rather, the invention is concerned only with so mounting the boot-engaging portion that it can readily perform lateral movements smaller than those required for triggering the actual release mechanism of the binding, and will be assisted in returning from such lateral movements to its centered or normal position.

According to the embodiment diagrammatically illustrated in FIG. 3 it is possible to provide an adjustment for the force with which the spring **5** or analogous means resists lateral movement of the plate **3**. As shown in FIG. 5, the spring or analogous means is composed of two discrete sections **5***a* each of which carries a contact plate **13**. The plates **13** are connected by threading into tapped bores provided in them the opposite end portions of an adjusting spindle **10**, with one of these end portions being provided with a right-hand thread and the other with a lefthand thread. The spindle **10** may be provided with a knurled wheel or other means for effecting turning movement, for instance with a bore into which a tool such as a screw driver, pin or the like may be inserted to effect turning of the spindle **10** about its own axis and thereby urge the sections **5***a* away from one another, or release such urging. Evidently, this results in precompression of the sections **5***a* or a release of such precompression, depending upon the direction in which the spindle **10** is turned, and thus adjusts the force with which the sections **5***a* will resist movement of the plate **3**.

It is emphasized that the support plate **6** may be omitted, for instance if the upper surface portion of the ski **1** is sufficiently smooth and hard to make it possible to mount the plate **3** directly on it. Furthermore, other modifications are of course readily evident to those skilled in the art, such as the fact that the invention may be utilized simultaneously on heel-engaging and toe-engaging portions, that the axis **4** may be located at a point different from that which has been illustrated, and that the spring **5** or analogous means may be positioned elsewhere than shown. For instance, the spring **5** or analogous means may be located below the portion **2**. Also, it is possible to replace the spring **5** by other means, as already pointed out, and one of these is for instance a torsion spring which may cooperate with a bearing defining the upright axis **4**.

Details concerning the actual mechanism of this release binding, a cover for the spring **5**, or the like, have been omitted for the sake of clarity and because they do not form a part of the invention.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of constructions differing from the types described above.

While the invention has been illustrated and described as embodied in a safety ski binding, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims:

1. In a safety ski binding, in combination, at least one boot engaging portion mountable on a ski for pivotal movement under the influence of a predetermined torsional force about a first upright axis from a normal operating position in which it connects a boot with the ski to a laterally displaced release position in which it disconnects the boot from the ski; and mounting means mounting said boot engaging portion for pivotal movement short of said release position in response to torsional forces smaller than said predetermined torsional force, said mounting means comprising a plate member pivotable relative to the ski about a second upright axis to and from a normal rest position, said plate member being located beneath said boot engaging portion and carrying the same for movement about said upright first axis and having a portion adapted to extend underneath and support the boot, and elastic means interposed between the ski and said plate member to directly engage and permanently bias said plate member to said rest position without influencing the angular position of said boot engaging portion relative to said plate member.

2. In a safety ski binding as defined in claim **1**, said elastic means comprising a helical spring.

3. In a safety ski binding as defined in claim **1**, said plate member being arranged to normally overlie an upper surface of the ski in rest position and being laterally pivotable about said upright second axis to a laterally displaced position, said axes being spaced lengthwise of the ski from one another.

4. In a safety ski binding as defined in claim **3**, further comprising a support plate mountable on an upper surface of the ski, and supporting said plate member.

5. In a safety binding, in combination, a stationary element arranged to be fixedly connected with a ski; at least one boot engaging portion mountable on a ski for pivotal movement under the influence of a predetermined torsional force about a first upright axis from a normal operating position in which it connects a boot with the ski to a laterally displaced release position in which it disconnects the boot from the ski; and mounting means mounting said boot engaging portion for pivotal movement short of said release position in response to torsional forces smaller than said predetermined torsional force, said mounting means comprising a plate member pivotable relative to the ski about a second upright axis to and from a normal rest position, said plate member being located beneath said boot engaging portion and carrying the same for pivotal movement about said first upright axis and having a portion adapted to extend underneath and support the boot, and elastic means ex-

tending transversely to the elongation of the ski and elastically urging said plate member to said rest position thereof counter to the action of said torsional forces, said elastic means bearing upon said stationary element and said plate member so as to be elastically compressed in response to pivotal movement of the latter relative to the ski whereby said plate member is permanently biased to said rest position without influencing the angular position of said boot engaging portion relative to said plate member.

6. In a safety ski binding as defined in claim 5; further comprising adjusting means for adjusting the resistance to compression offered by said elastic means.

7. In a safety ski binding as defined in claim 6, said elastic means comprising an elastic member having two discrete sections spaced from one another in the direction in which said torsional forces act upon said elastic member; and said adjusting means comprising a screw spindle having opposite end portions which are respectively provided with right-hand and left-hand threads

and each threadedly connected with one of said sections.

8. In a safety ski binding as defined in claim 7; and a pair of contact portions each provided on one of said sections and provided with an internally threaded bore with which the threads on the respective end portions of said spindle mesh.

References Cited

UNITED STATES PATENTS

3,145,027	8/1964	Berchtold	280—11.35 C
3,406,981	10/1968	Scheib	280—11.35 T
3,430,971	3/1969	Berlenbach	280—11.35 T
3,455,570	7/1969	Salomon	280—11.35 T

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280—11.35 C