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[21] Appl. No. **9,165**

[22] Filed **Feb. 6, 1970**

[45] Patented **Dec. 14, 1971**

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[32] Priority **Feb. 7, 1969**

[33] **Germany**

[31] **P 19 06 244.9**

[56] **References Cited**

UNITED STATES PATENTS

3,194,574	7/1965	Beyl	280/11.35 T
3,329,438	7/1967	Lusser	280/11.35 T
3,508,761	4/1970	Huss	280/11.35 T

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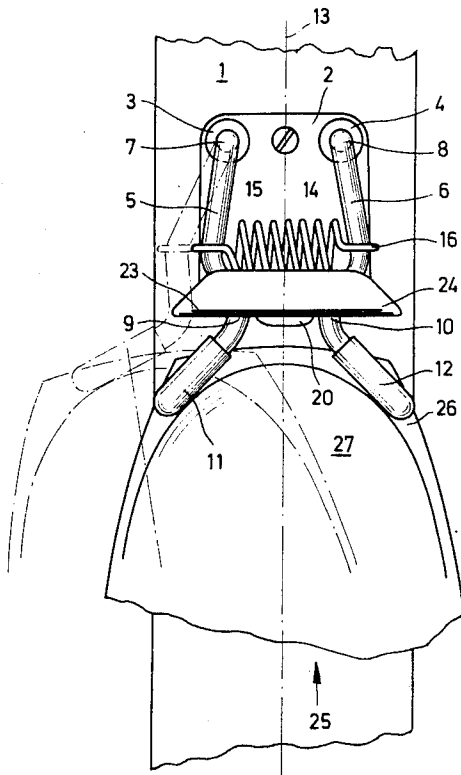
[54] **FRONT SAFETY BINDING FOR A SKI**
 3 Claims, 3 Drawing Figs.

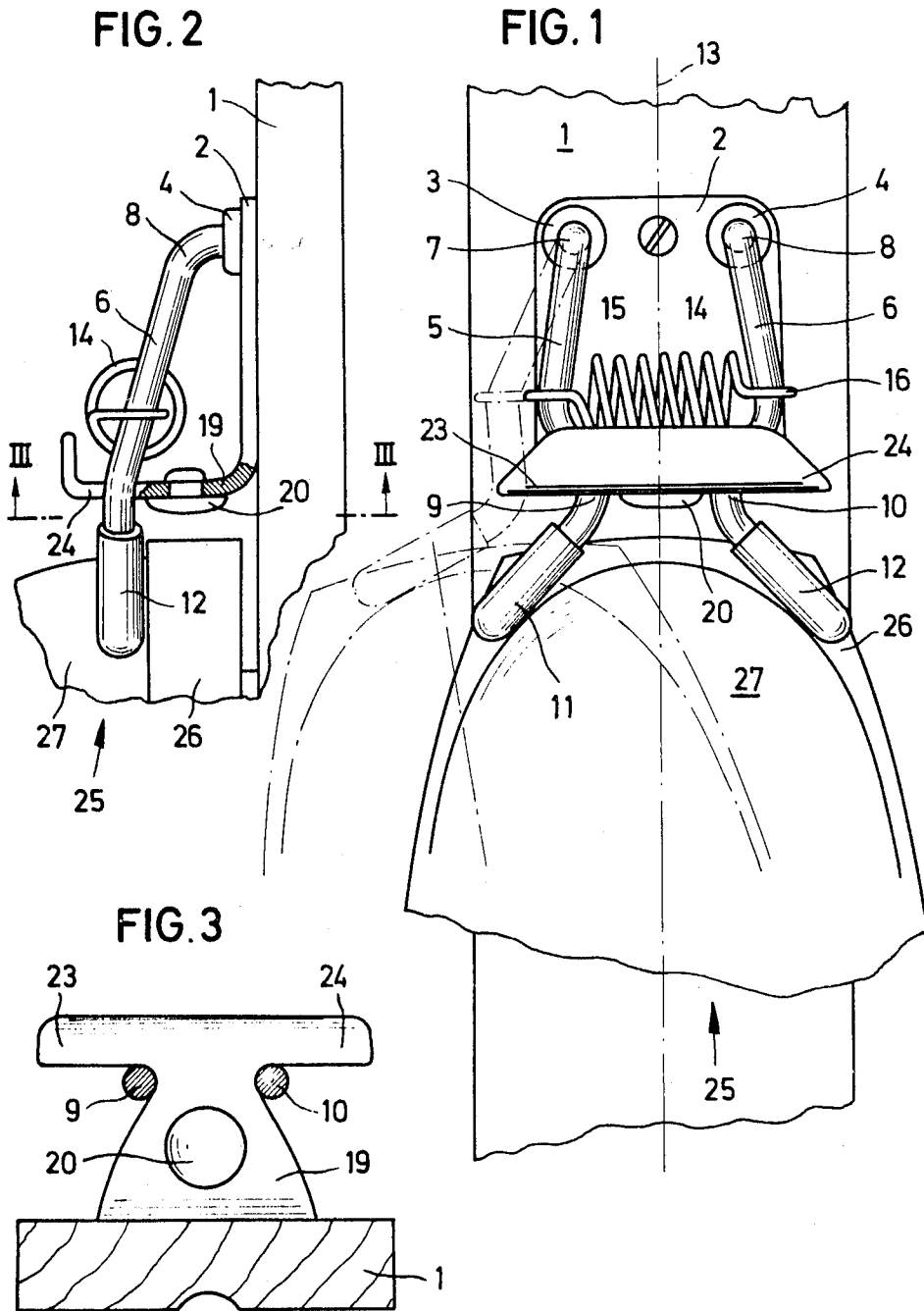
[52] U.S. Cl. 280/11.35 T

[51] Int. Cl. A63c 9/00

[50] Field of Search..... 280/11.35 T

ABSTRACT: A front safety binding for a ski boot in which two rearwardly diverging jaws arranged on two independently swingable spring-biased arms serve, in their normal position, to engage the toe of the ski boot and which arms, when a predetermined torsional force is exceeded, can be displaced laterally against the action of the spring from a stop plate located between the arms until the toe of the ski boot is released by the laterally displaced jaw. The rear surface of the stop plate is provided with a support of material which, together with the material of the toe portion of the boot, has a lesser coefficient of friction than the material of the stop plate per se.





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FRONT SAFETY BINDING FOR A SKI

BACKGROUND OF THE INVENTION

This invention is an improvement on the front safety binding for skis as described in the U.S. Pat. No. 3,329,438 and in this patent there is disclosed a front binding for a safety binding for skis provided with two rearwardly diverging jaws which, in their normal position, serve as a front installation for a sole of the ski boot and such jaws are arranged on two independent swingable arms, which, when exceeding a predetermined torsional force against the resistance of a spring about a point of rotation located forwardly of the toe of the ski boot, can be moved laterally so far from a stop mounted on the ski between the arms until the toe of the boot is released from the outwardly swung jaws. In the front binding according to the above-mentioned patent, the swingable arms are connected via the spring means in such a manner that in every swingable position the arms are subjected to the resiliency of the spring.

In a binding of this construction the stop which limits the swinging movement of the arms towards each other is not normally contacted by the ski boot. This is true during skiing as well as during a common twisting fall in the course of which the front safety binding is supposed to release the ski boot for preventing the endangered leg of the skier being subjected to an excessive torsional stress. Pure twisting falls in which one of both legs of the skier are endangered by torsional stress only do not occur too frequently. In the majority of situations, a front fall is superimposed on a twisting fall in which the skier falls forwardly after one or both skis have become stuck or embedded in the snow. For preventing injury during front falls, safety front bindings are normally combined with safety heel bindings which release the heel of the boot as soon as the upwardly exerting force thereon exceeds a certain degree. During combined twisting and front falls, the so-called diagonal falls, special problems can develop such as the retaining forces of the front binding and the heel binding not being correctly balanced with respect to each other, the distance between both bindings not being correctly adjusted, or the sole of the ski boot being deformed by the force exerted through a fall in such a fashion that the release of the heel binding is delayed.

Basis to this invention is the observation that a ski boot during a severe diagonal fall, when the heel binding does not release the heel of the boot in time, can exert an increased thrust upon the front binding so that the front binding releases the toe of the boot only when a dangerous twisting force exceeding the anticipated range develops. The releasing force of all known safety ski front bindings depends more or less essentially upon the ski boot exerting its thrust forwardly into the binding. In a safety front binding of the above type, a forwardly directed thrust which exceeds significantly the normal range during a diagonal fall can result in the swingable arms not being capable of retaining the toe of the boot at a predetermined distance behind the stop which is located between the swingable arms. In this situation, the toe of the boot is pressed against the stop and the friction developing between the toe of the boot and the stop means that it is more difficult for the toe of the boot to free itself laterally from the front binding.

The object of this invention is to make independent the effect of a safety front binding for a ski of the above type from the forwardly directed thrust occurring during diagonal falls and this is particularly applicable to a front binding according to the above-mentioned patent. It should be pointed out that with such a binding it is particularly important to prevent additional thrusts of unforeseeable magnitude operating against the lateral movement of the toe of the boot from superposing themselves upon the resiliency of the spring encountered in each swinging position of the jaw-carrying arms.

SUMMARY OF THE INVENTION

According to the invention, the above-described object for a safety front binding for a ski of the above-discussed con-

struction is achieved in that the stop plate, at its rear surface, is provided with a support of any material which, in combination with the material of the toe portion of the boot possesses a coefficient of friction which is less than the coefficient of friction of the stop plate per se.

For facilitating the lateral movement of the toe of the boot, the support, when viewed in section parallel to the ski surface, possesses a convex curvature. The mounting of the support is particularly simple in construction and reliable in operation in that such support is defined by a mushroom-shaped component, preferably consisting of tetrafluoroethylene, having a stem portion anchored in an aperture provided in the stop plate.

Further objects and advantages of the present invention will become more readily apparent to persons skilled in the art from the following detailed specification and annexed drawings, and in which drawings:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary plan view of a front binding embodying the present invention for securing a ski boot to a ski,

FIG. 2 is a fragmentary side view, partly in section, of the binding illustrated in FIG. 1, and

FIG. 3 is a view taken along the line III—III of FIG. 2 the view looking in the direction of the arrow.

DETAILED DESCRIPTION OF THE INVENTION

It will be seen that the present safety front binding includes a baseplate 2 preferably of stainless steel which is secured to the upper or top surface of a ski 1 by suitable means such as screws. In proximity to the forward edge of the baseplate 2 are two upwardly extending spaced-apart sockets 3 and 4 which may be riveted to the plate 2. Swingable arms 5 and 6, respectively, are mounted in the sockets 3 and 4 and extend substantially rearwardly therefrom, and the front ends of the arms are bent to define a right angle with the baseplate 2. The swingable arms 5 and 6 are preferably of round steel and the rear portions of the arms are formed with inwardly directed offsets 9 and 10, respectively, and from such offsets extend jaws 11 and 12, respectively, parallel to the plane of the plate 2 in a rearward and outward direction. It will be noted that the entire front binding is symmetrical with reference to symmetrical plane 13 of the ski.

The swingable arms 5 and 6 are interconnected by a helical tension spring, 14 and the respective ends of the springs denoted 15 and 16 are in the nature of hooks which engage a notch on the outside of each swinging arm. The spring 14 maintains the arms 5 and 6 under a substantial initial tension of, for example, 10 kg., against a stop 19. The stop 19 is formed by bending the rear end of the baseplate 2 upwardly perpendicularly to the plane of the plate 2 at a point rearwardly of the spring 14. The stop 19 is provided with outwardly extending arms or guide means 23 and 24 under which the offsets 9 and 10 of the arms are guided during swinging movement.

It will be further noted that the stop 19 is provided with a centrally arranged aperture in which a mushroom-shaped component 20 is anchored. The component 20 is of tetrafluoroethylene and it will be appreciated that the convex head of the component 20 constitutes a rearwardly directed supporting surface.

The jaws 11 and 12 may be provided with coverings of a material such as tetrafluoroethylene and the jaws retain the toe of a ski boot 25 in such a fashion, as illustrated in FIG. 1 in solid lines, that the jaws grasp the front edge of a sole 26 of the boot on both sides of the symmetrical plane 13 and rest against a boot toe cap 27. The ski boot 25 is additionally secured at its heel portion by a heel binding (not illustrated).

The front edge of the sole 26 normally is arranged against the part 20 at a notable distance therefrom since the jaws 11 and 12 are supposed to constitute the only forward support point of the ski boot. This is also true for a normal releasing

operation during which the toe of the boot, as shown in FIG. 1 in dotdash lines, executes only a laterally directed swinging movement with the point of rotation thereof lying within the range of the heel of the boot held in place by the heel binding. If, however, the toe of the boot during a diagonal fall, under most undesirable conditions, is thrust forwardly with considerable force, the sole of the boot does not support itself with its forward edge on the stop 19 per se but, rather, on the mushroom-shaped component 20 whose slight coefficient of friction ensures that the lateral outwardly directed movement of the toe of the boot cannot be appreciably hindered by frictional forces existing between the toe of the boot and the stop of the front binding.

What is claimed is:

1. In a front ski safety binding of the type comprising: two arms extending substantially longitudinally of the ski means swingably mounting each arm adjacent one end thereof to the ski for movement in a plane substantially parallel to the upper surface of the ski; two jaws one each at the free end of each arm extending outwardly with respect to the plane of symmetry of the ski, said jaws constituting the only normal forward support for an associated ski boot; a fixed stop on the ski intermediate the means swingably mounting the arms to the ski and the jaws for coaction with the arms spring means inter-

connecting the arms for normally maintaining the jaws in engagement with the toe of the ski boot, said arms being swingable laterally from the stop when exceeding a predetermined swinging force against the action of the spring means about a center of rotation located forwardly of the toe of the ski boot until the boot is freed from the outwardly swung jaws, the improvement being in that said fixed stop includes a rearwardly projected stationary support of a material having a lesser coefficient of friction with respect to the toe of the ski boot than the fixed stop per se, so that when a forward thrust in excess of a predetermined limit is exerted by the boot on the front safety binding, the front of the boot sole would rubbingly engage said fixed support of low-friction material so that the release of the boot from the ski is facilitated.

2. The front ski safety binding as claimed in claim 1 in which said rearwardly projected stationary support, viewed in a section parallel to the ski surface, is provided with a convex surface projecting in the direction of the heel of the ski boot.

3. The front ski safety binding as claimed in claim 1 in which said rearwardly projected includes a mushroom-shaped member of tetrafluoroethylene having a stem portion anchored in an aperture in the fixed stop.

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