Sept. 22, 1970 G. P. J. SALOMON 3,529,844

SAFETY BOOT BINDING FOR SKIS

Filed Feb. 14, 1968 5 Sheets-Sheet 1

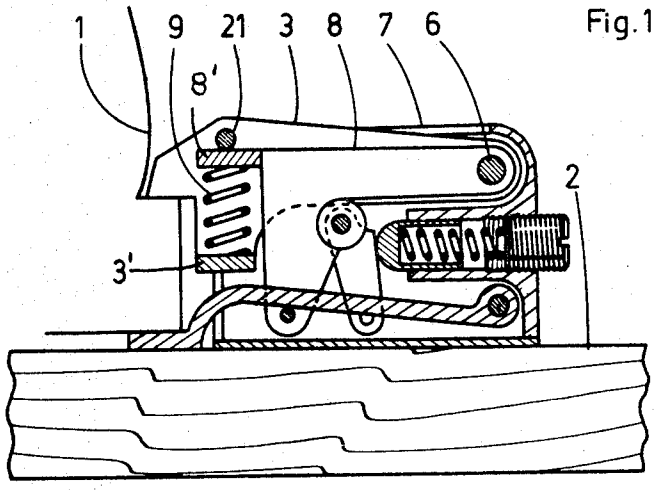


Fig.1

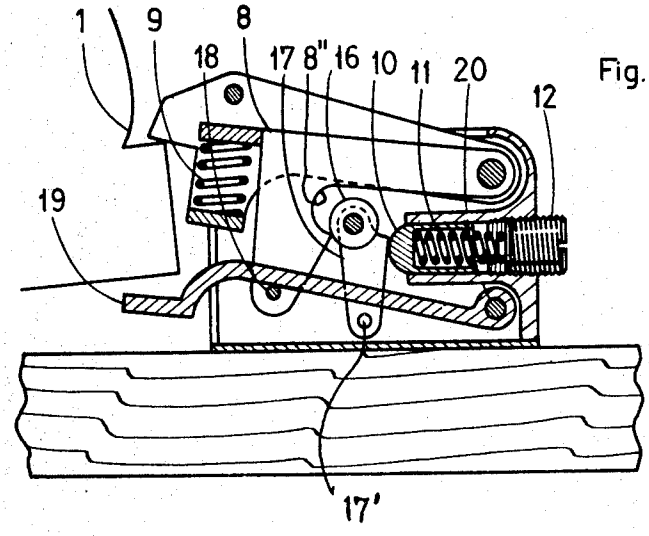


Fig.2

Inventor

Georges Pierre Joseph SALOMON

By Pierre Lespérance

Agent

Sept. 22, 1970 G. P. J. SALOMON 3,529,844

SAFETY BOOT BINDING FOR SKIS

Filed Feb. 14, 1968

5 Sheets-Sheet 2

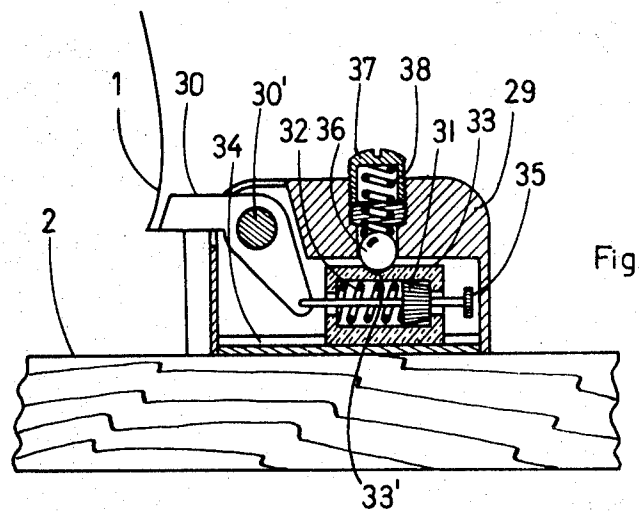


Fig. 3

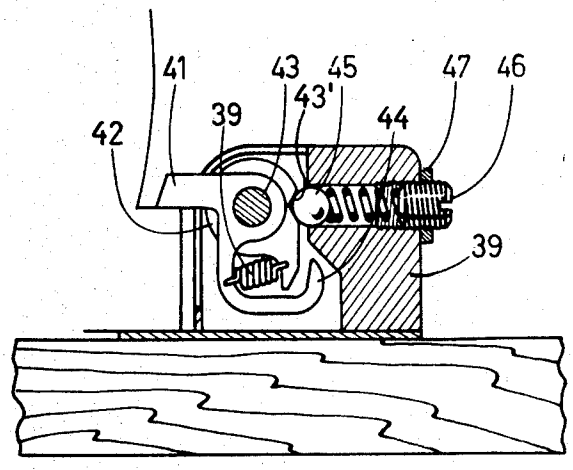


Fig. 4

Inventor
Georges Pierre Joseph SALOMON
By Pierre Espérance
Agent

Sept. 22, 1970 G. P. J. SALOMON 3,529,844

SAFETY BOOT BINDING FOR SKIS

Filed Feb. 14, 1968

5 Sheets-Sheet 3

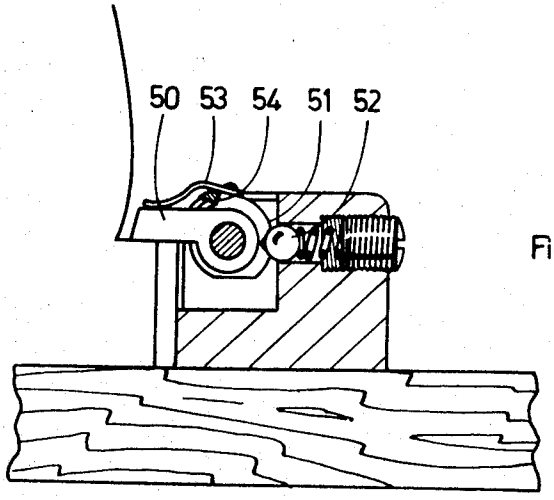


Fig. 5

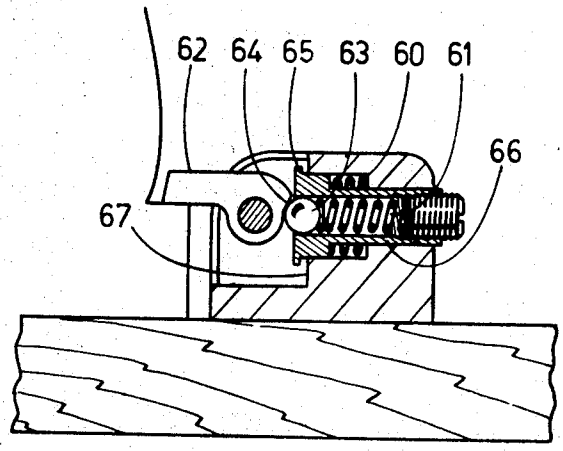


Fig. 6

Inventor
Georges Pierre Joseph SALOMON
By Pierre Espérance
Agent

Sept. 22, 1970 G. P. J. SALOMON 3,529,844

SAFETY BOOT BINDING FOR SKIS

Filed Feb. 14, 1968 5 Sheets-Sheet 4

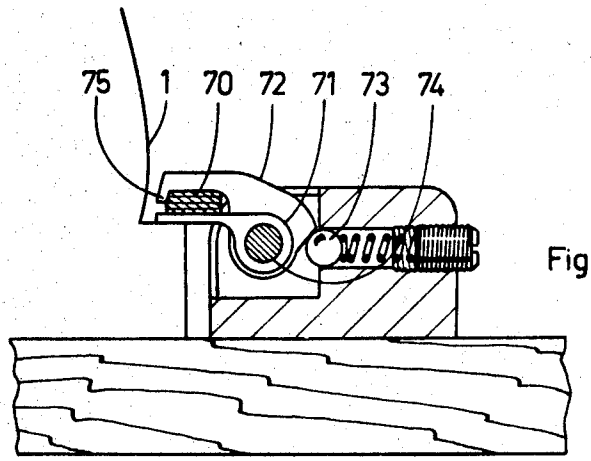


Fig.7

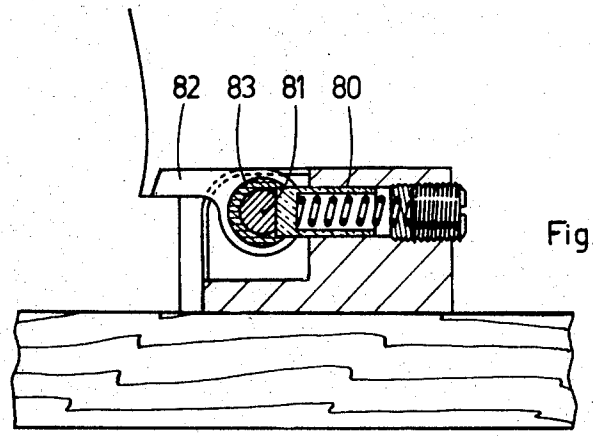


Fig. 8

Inventor
Georges Pierre Joseph SALOMON
By Pierre Lespérance
Agent

Sept. 22, 1970 G. P. J. SALOMON 3,529,844

SAFETY BOOT BINDING FOR SKIS

Filed Feb. 14, 1968

5 Sheets-Sheet 5

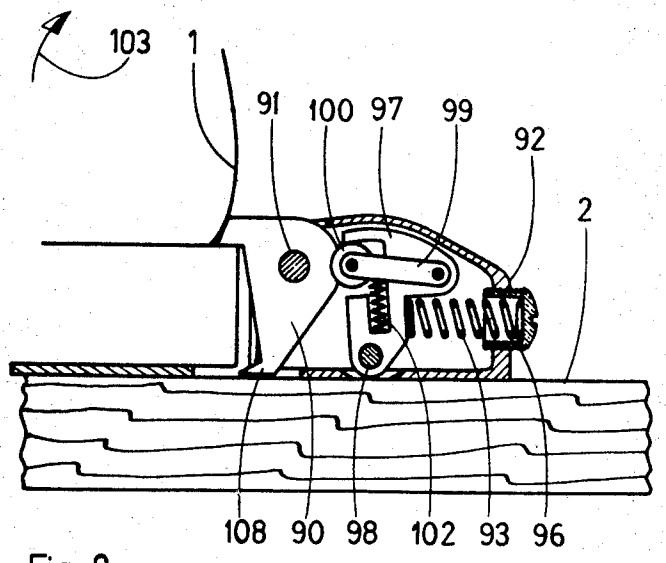


Fig. 9

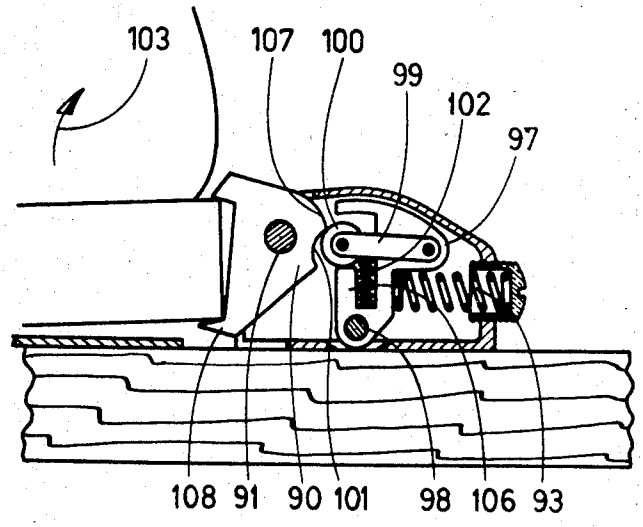


Fig. 10

Inventor

Georges Pierre Joseph SALOMON

By Pierre Lespérance

Agent

United States Patent Office 3,529,844 Patented Sept. 22, 1970

3,529,844

SAFETY BOOT BINDING FOR SKIS

Georges P. J. Salomon, 34 de Loverchy Ave., Annecy, Haute-Savoie, France

Filed Feb. 14, 1968, Ser. No. 705,554
Claims priority, application France, Sept. 5, 1967, 120,065
Int. Cl. A63c 9/084
U.S. Cl. 280—11.35 6 Claims

ABSTRACT OF THE DISCLOSURE

The present invention concerns a safety binding for securing a boot on a ski, in which an elastic element is made part of the kinematic transmission chain between the safety locking mechanism and the boot retaining element, whereby the latter is capable of a certain elastic play before release under the action of abnormal forces exerted by the boot on the boot retaining element.

The present invention relates to a safety binding for securing a boot on a ski.

Known safety bindings of the character described release the boot in an abrupt and fast manner. This arrangement has the disadvantage of not absorbing forces which are not yet dangerous for the user, causing abrupt boot release and the fall of the user.

The general object of the invention is to obviate the above-mentioned disadvantage in a simple and efficient manner.

In accordance with the invention, an elastic element is interposed in the kinematic transmission chain between the boot retaining element and the safety locking mechanism, whereby abnormal forces exerted by the user's boot on the boot retaining element will cause said boot retaining element to effect a certain elastic movement before the safety locking mechanism is constrained to completely release the boot retaining element.

In accordance with an embodiment of the invention, the safety locking mechanism and the kinematic transmission chain consist of a spring element acting on a lever on which a roller carrying lever is oscillatably mounted, the roller engaging a corresponding notch in the boot retaining element, a spring element being disposed between said two levers.

The present invention will be more clearly understood by referring to the following description and to the annexed drawings showing various embodiments in a non-limitative manner.

In the drawings:

FIG. 1 is a longitudinal section of a safety boot binding for skis in accordance with a first embodiment, in closed position;

FIG. 2 is a view similar to that of FIG. 1, showing the binding in partially open position;

FIGS. 3, 4, 5, 6, 7, 8, and 9 are longitudinal sections of various embodiments of the invention in closed position; and

FIG. 10 is a longitudinal section of the safety binding in accordance with FIG. 9, in partially open position.

Referring more particularly to the drawings in which like reference characters indicate like elements throughout, in FIG. 1 the user's boot **1** is secured on a ski **2** by means of a jaw **3** pivoted on a pivot **6** of a housing **7** of the binding in accordance with the invention.

An arm **8** is also pivoted in pivot **6** and a coil spring **9** is interposed between flange **3'** of jaw **3** and flange **8'** of arm **8**. Therefore, when jaw **3** is urged upwardly by the user's boot **1**, as shown in FIG. 2, it will first cause compression of spring **9** and then cause upward pivoting

of arm **8**, which can then be released from the safety locking mechanism.

This safety locking mechanism comprises a piston **10** pushed by a compression coil spring **11**, the pressure of which can be adjusted by a screw **12** threaded in housing **7**.

Spring-pressed piston **10** bears against a lever **17** pivoted in housing **7** at **17'** and carrying a roller **16** engageable with a notch **8''** of arm **8**. Moreover, arm **8**, when pivoting upwardly, also causes upward pivotal movement of a treadle **19**, which is pivoted to housing **7** at **20**, said treadle being engaged by a stud **18** carried by arm **8** and protruding from housing **7** to be engaged by the bottom face of the user's boot. Thus, after release of the safety binding treadle **19** enables re-cocking of the binding by simple downward pressure of the heel of the user's boot **1**.

Preferably, as shown in FIG. 1, a stud **21** limits the pivotal movement of arm **8** relative to jaw **3**.

In FIG. 3, a boot retaining jaw **30** is pivoted at **30'** in housing **29** and its lower end is attached to a piston rod of a piston **31** adapted to compress a compression spring **32** within a slide element **33**, which is slidably mounted in guideways **34** of the base plate of housing **29**.

When the jaw **30** is caused to move upwardly, the spring **32** is compressed until the head **35** of the piston rod abuts the slide element **33** which is caused to move towards boot **1**, thereby forcing the release of a ball type safety locking mechanism which comprises a cap screw **37** adjustably screwed in housing **29** and pressing by means of a coil spring **38** a ball **36**, so that the latter will normally engage a notch **33'** in slide element **33**.

In FIG. 4, the elastic element consists of a tension spring **40** interconnecting a boot retaining jaw **41** and a crank arm **42**, said jaw and crank arm being both pivoted on a pivot **43** mounted in housing **39**. The jaw **41**, beyond a predetermined upward pivotal movement, will cause rotation of crank arm **42** by the arm portion **44** of the jaw **41** abutting crank arm **42**, thereby causing release of the spring-pressed ball **45** from out of the notch **43'** of the crank arm **42**.

The spring-pressed ball **45** is adjustable by means of the screw **46** threaded in housing **39** and locked in position by lock nut **47**.

The embodiment of FIG. 5 is differentiated from the embodiment of FIG. 4 in that the elastic element connecting the jaw **50** to the crank arm **51**, which in turn is under the action of the spring-pressed adjustable ball lock **52**, is a spring blade **53** secured to the crank arm **51** and pressing on the jaw **50**.

An abutment **54** which is integral with crank arm **51**, will abut the jaw **50** during upward movement of said jaw only after the spring blade **53** has been fully stressed.

In the embodiment of FIG. 6, two compression coil springs **60** and **61** are mounted in parallel, the first and weaker one surrounding the second and assuring the elastic pivotal movement of a jaw **62**, the second stronger spring **61** urging the locking ball **63** against a ramp **64** of the jaw **62**, said ball releasing the jaw only when the rim **65** of the slidable sleeve **66** enclosing the safety locking mechanism, abuts against face **67** of the clamp housing.

In FIG. 7, a rubber-like block **70** is inserted between jaw **71** for retaining a user's boot **1** and a cam **72** receiving the locking action of the spring-pressed adjustable ball lock mechanism **73**, the jaw and the cam being pivotally mounted on a common shaft **74**. Moreover, an abutment **75** of the cam **72** serves to transmit the forces exerted by the user's boot to the locking mechanism while preventing complete compression of the rubber-like block **70**.

In FIG. 8, the locking mechanism is a piston **80** spring pressed against a flat of a shaft **81**, the latter being

connected to a boot retaining jaw **82** by the interposition of a rubber bushing **83** of the silent block type, which enables a slight angular elastic movement between the jaw and the shaft.

In FIGS. 9 and 10, the boot **1** is secured on the ski **2** by means of a jaw, or boot retaining element **90**, pivoted on a shaft **91** of the housing **92**, itself secured on top of the ski by means of screws, not shown, on the drawing.

The jaw **90** is locked in a boot retaining position by means of a compression coil spring **93**, the compression of which is adjusted by a cap screw **96** screwed in the housing **92**. The coil spring **93** bears against a main lever **97** pivotally mounted on a shaft **98** secured to the housing.

On the main lever **97** can oscillate a second lever **99** carrying at its free end a locking roller **100** adapted to engage a notch **101** of the jaw **90**.

A compression coil spring **102** is disposed between the lever **99** and the reversing lever **97**. When abnormal stresses are exerted by the user's boot, the latter tries to open the clamp, as shown by arrow **103** (see FIG. 10); the jaw **90** will first cause roller **100** and lever **99** to move against the action of spring **102**.

If the forces exerted by the boot which have caused the above movement cease, the jaw **90** is resiliently returned in its original position by means of spring **102**. If, on the contrary, the forces continue and exceed a predetermined value considered as dangerous, roller **100** will engage against portion **106** of main lever **97**. The latter is thus forced to pivot rearwardly, because the end of the notch **101** now engages the roller **100**; but the rearward pivotal movement of the reversing lever is resisted by the action of the locking spring **93**. Once this spring force is overcome, the jaw will completely open, the roller **100** rotating on portion **107** of the jaw, said portion **107** being concentric with shaft **91**.

For re-cocking the binding, the user's boot heel is pressed down on the extension **108** of the jaw **90** and closes the latter. The roller **100** urged by springs **93** and **102** will return to its locking position in engagement with notch **101** of the jaw.

What I claim is:

1. A safety boot binding for skis comprising a support adapted to be fixed to a ski, a boot retaining member and an intermediate arm pivotally mounted on said support, each for pivotal movement about a horizontal axis disposed transversely of the ski, first spring means resiliently retaining said intermediate arm in a predetermined position until a torque exerted on said intermediate arm reaches a maximum and releasing said intermediate arm for pivoting movement out of said predetermined position upon said torque exceeding said maximum, and second spring means acting on said boot retaining member and on said intermediate arm and urging, when said intermediate arm is in said predetermined position, downward pivoting of said boot retaining member into a closed position to retain a boot on the ski, said second spring means stressed by opening movement of said boot retaining member, while said intermediate arm is held in said predetermined position, until a force is transmitted from said boot retaining member to said intermediate arm, which produces a torque on said intermediate arm in excess of said maximum, causing rotation of said intermediate arm and allowing further opening movement of said boot retaining member.

2. A safety boot binding as claimed in claim **1**, wherein said boot-retaining member and said intermediate arm are pivoted on a common axis, extend forwardly of the same and have superposed spaced lower and upper flanges respectively, said second spring means being a compression coil spring disposed between and bearing against said flanges and means to limit the downward pivoting of said boot-retaining member.

3. A safety boot binding as claimed in claim **2**, wherein said last-named means include a stop carried by said boot-retaining member and abutting said intermediate arm in the closed position of said boot-retaining member.

4. A safety boot binding as claimed in claim **1**, further including a recocking treadle pivoted on said support and protruding therefrom to engage under a boot heel and having an intermediate portion engaged with said intermediate arm, whereby pivotal movement of said intermediate arm out of its predetermined position, causes upward pivoting of said treadle and a downward force exerted on said treadle causes return of said intermediate arm to its predetermined position.

5. A safety boot binding as claimed in claim **1**, wherein said first spring means include a lever pivoted on said support, a roller carried by the free end of said lever and engageable with a notch of said intermediate arm, and a spring-pressed piston carried by said support and engaging said lever to urge said roller into said notch to maintain said intermediate arm in its predetermined position.

6. A safety boot binding as claimed in claim **1**, wherein said boot-retaining member and said intermediate arm are pivoted on a common axis and further including mutually inter-engageable abutment surface portions on said boot-retaining member and said intermediate arm respectively, radially spaced from said common pivotal axis and mutually engaged at a predetermined stage of opening movement of said boot-retaining member.

References Cited

UNITED STATES PATENTS

2,823,922	2/1958	Berlenbach.
2,867,447	1/1959	Mueller.
3,326,568	6/1967	Salomon.

FOREIGN PATENTS

268,301	2/1964	Australia.
Ad. 55,685	9/1952	France.
1,440,444	4/1966	France.

LEO FRIAGLIA, Primary Examiner

J. A. PEKAR, Assistant Examiner