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Courvoisier et al.

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[45] **Sept. 30, 1975**

[54] **KNEE TWIST SENSING SKI BINDING**

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**[2] **A63C 9/08**

[58] **Field of Search** ..... 280/11.35 R. 11.35 D, 280/11.35 M, 11.35 K, 11.35 T, 11.36

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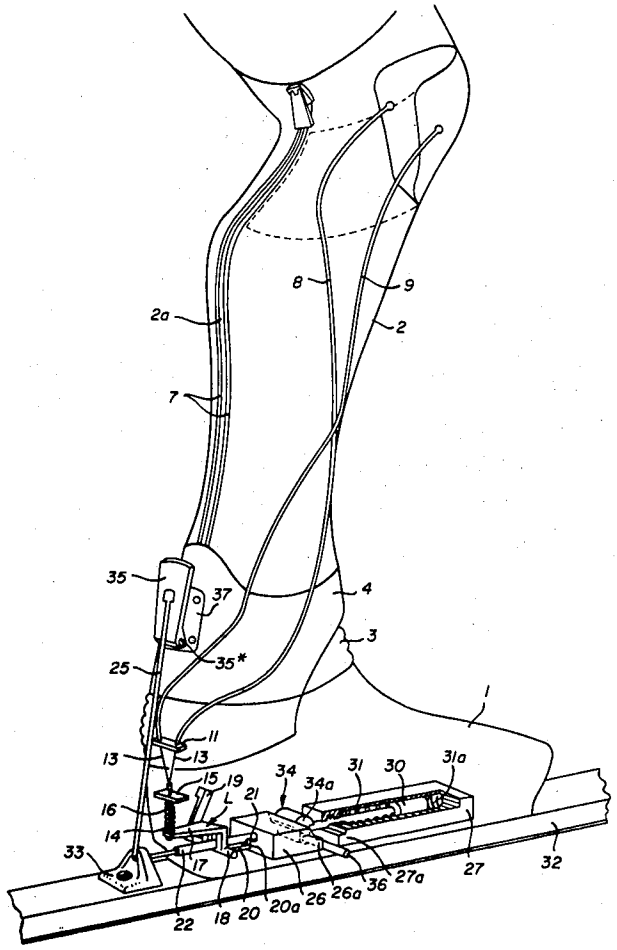
Assistant Examiner—David M. Mitchell
Attorney, Agent, or Firm—Karl F. Ross; Herbert Dubno

[57] **ABSTRACT**

A ski binding for preventing twist-type fractures of the lower leg has an elongated sensor element extending between the knee region of the skier and the ski boot and responsive to angular displacement of the knee relative to the foot so as to release a locking mechanism interconnecting the boot to the ski when excessive twist between the foot and the knee is detected. This sensor element can comprise a Bowden-type cable whose core projects more or less from the sheath as the leg is twisted. Alternately a nontwistable but otherwise flexible element extending from the knee to the latch in the boot is provided which operates the locking mechanism securing the boot to the ski.

10 Claims, 16 Drawing Figures



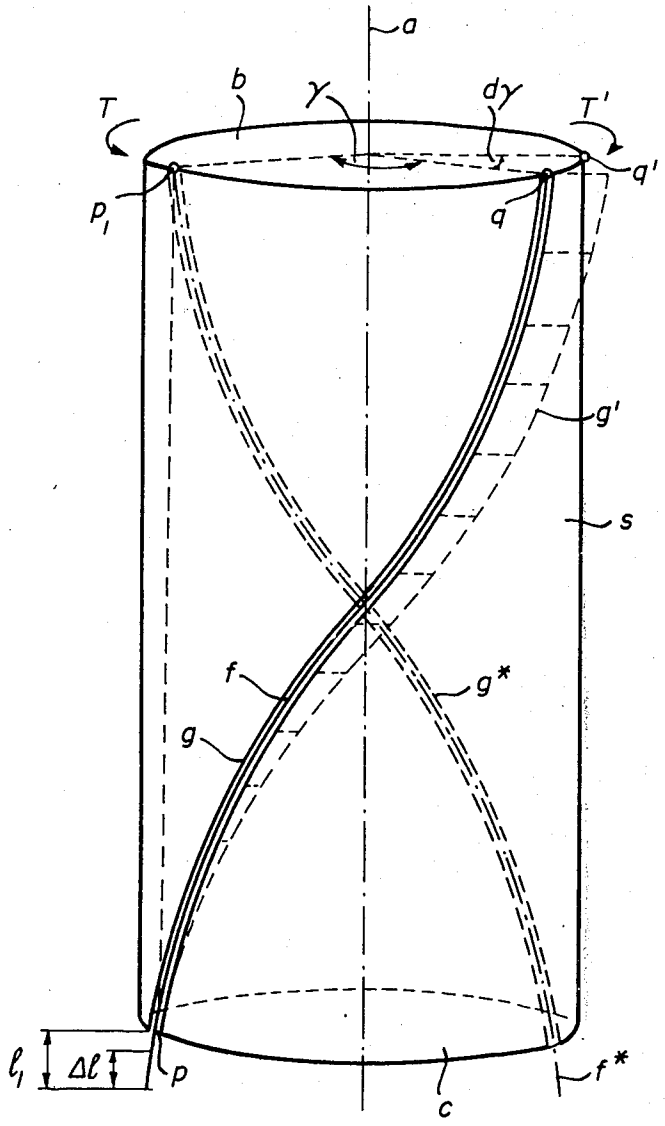
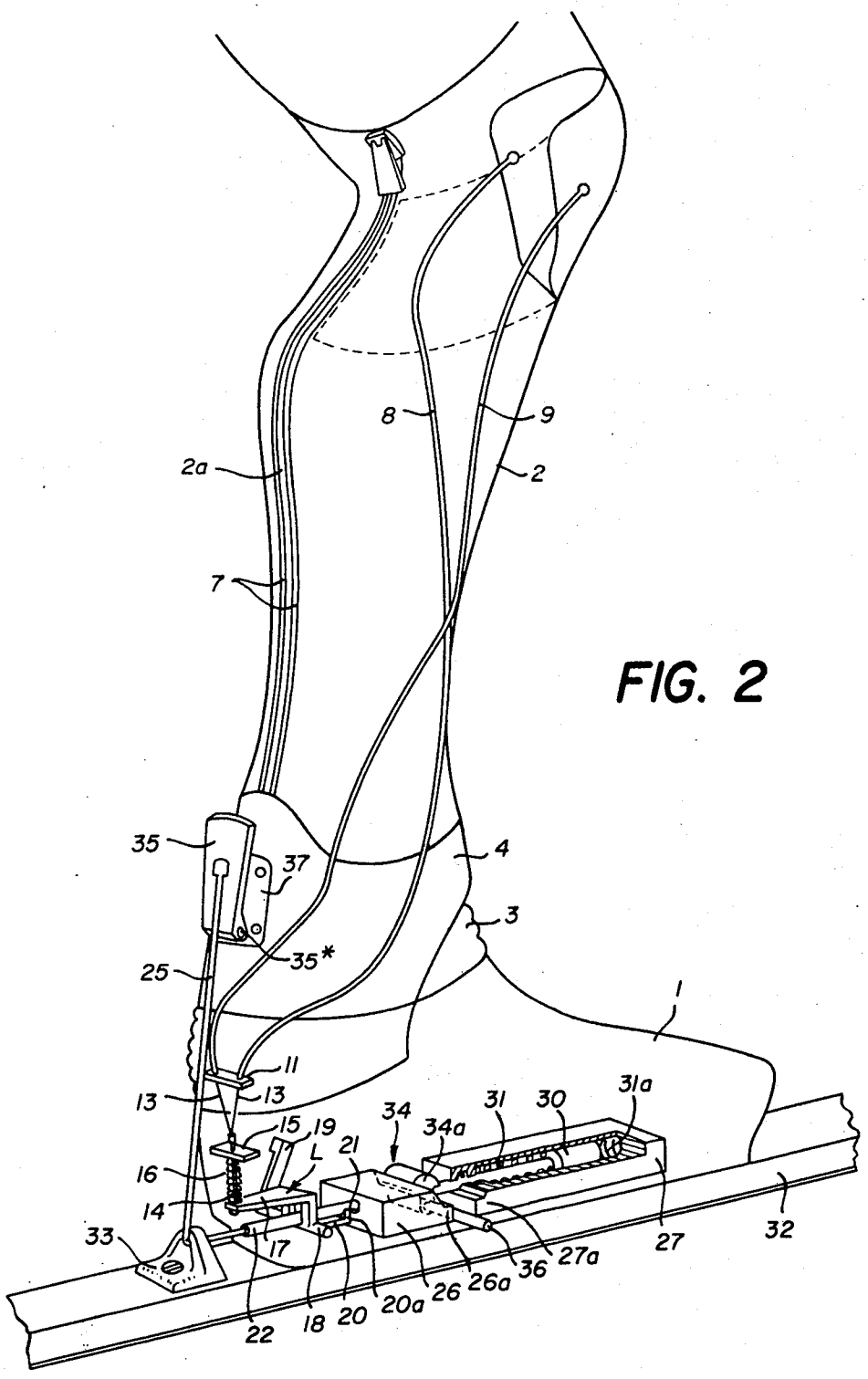


FIG. 1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7
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37
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35*
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21
34
34a
31
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20a
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26a
36
27a
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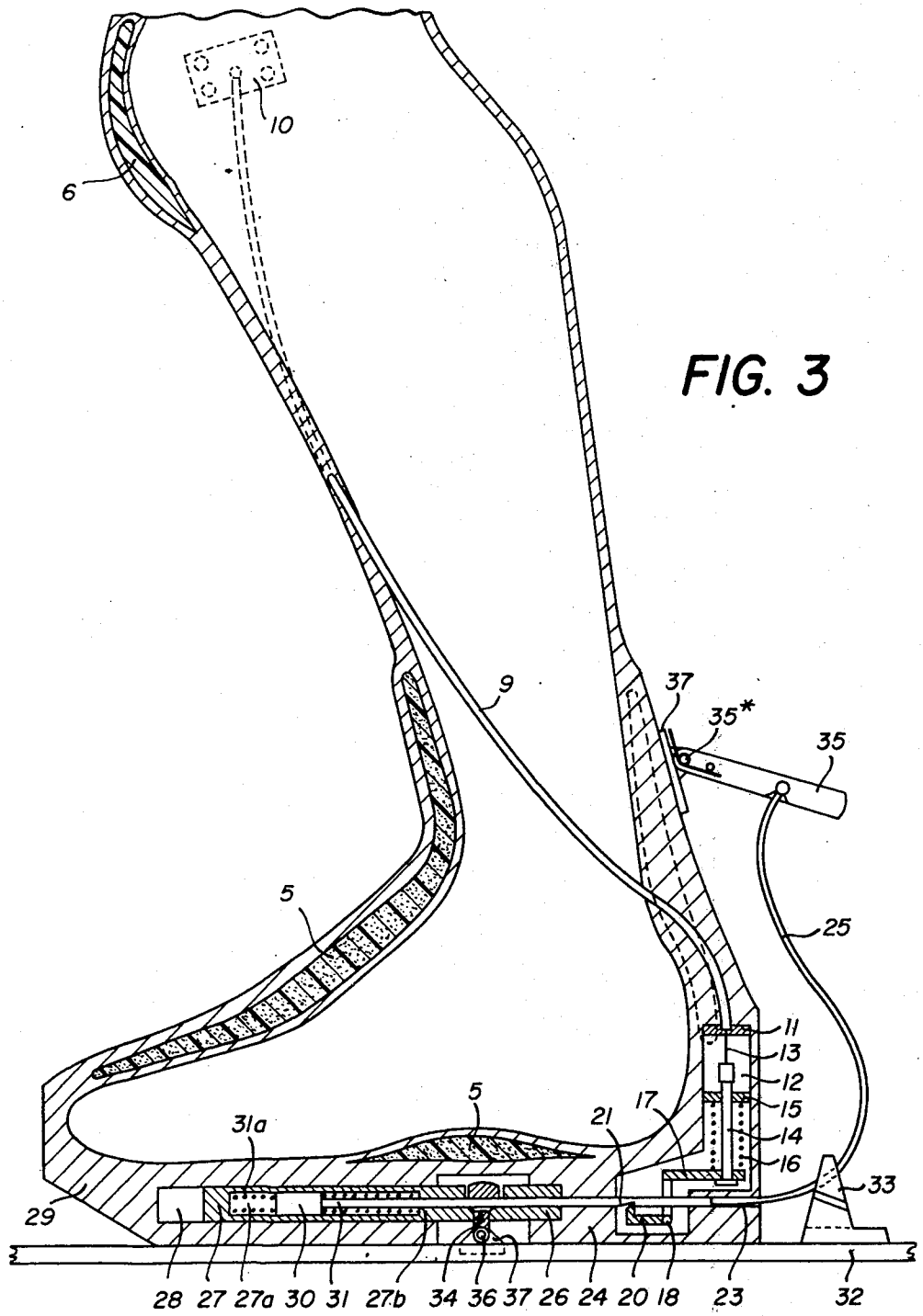
FIG. 2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31a
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27a
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27b
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23
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FIG. 3

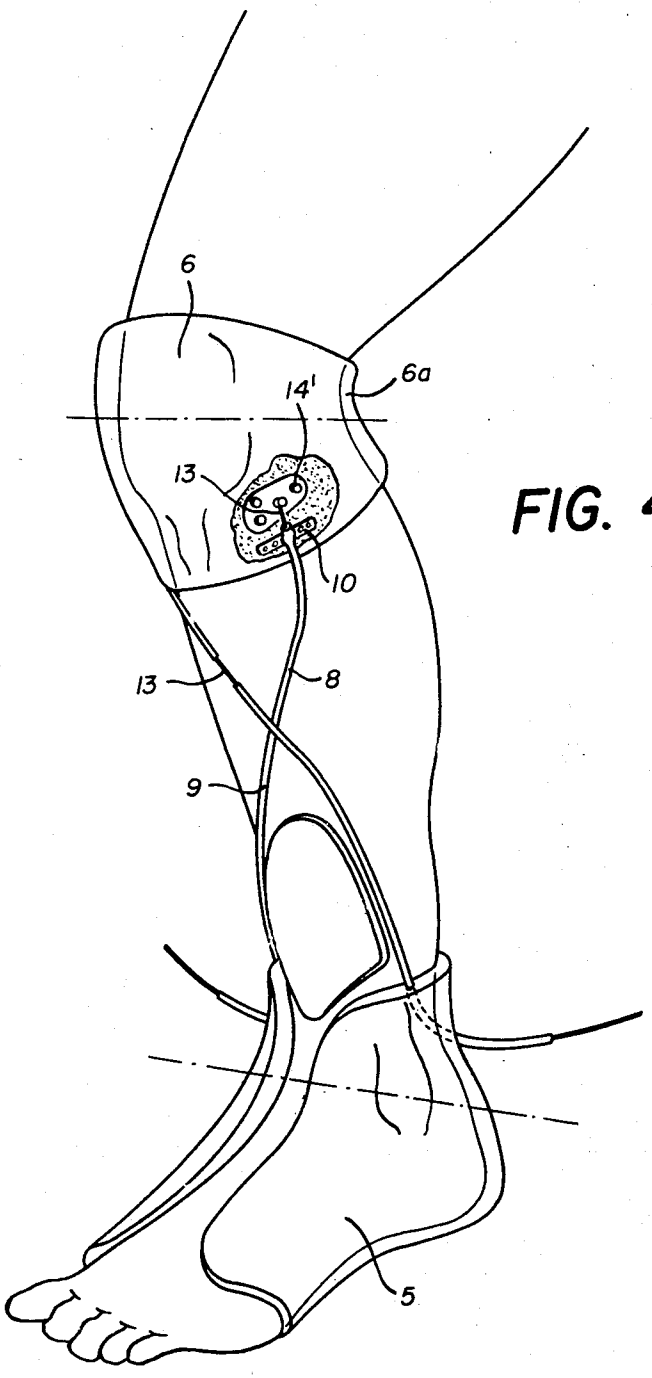


FIG. 4

FIG. 5

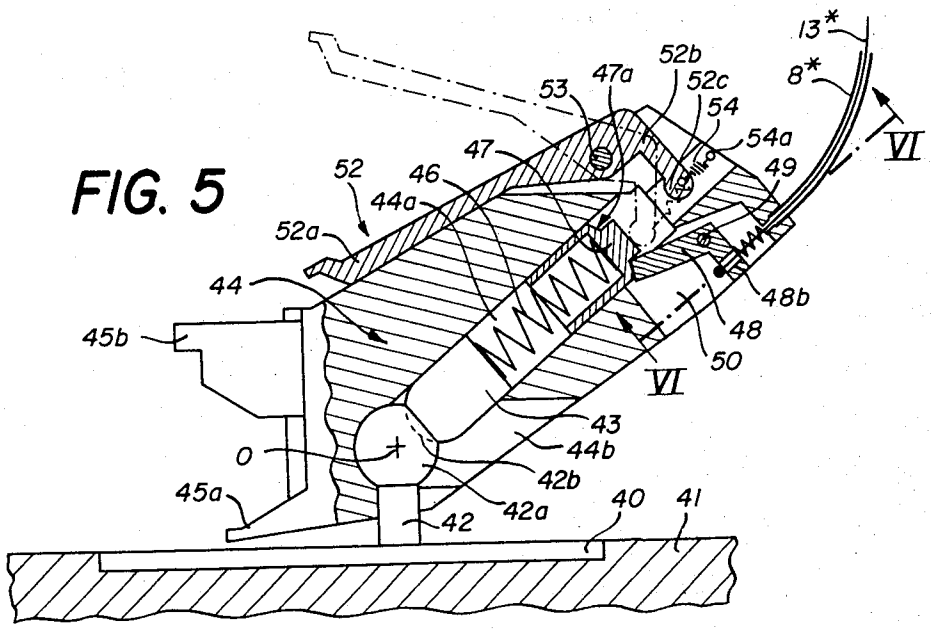


FIG. 6

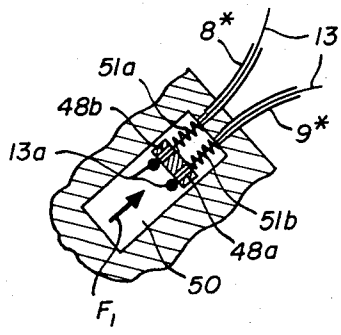
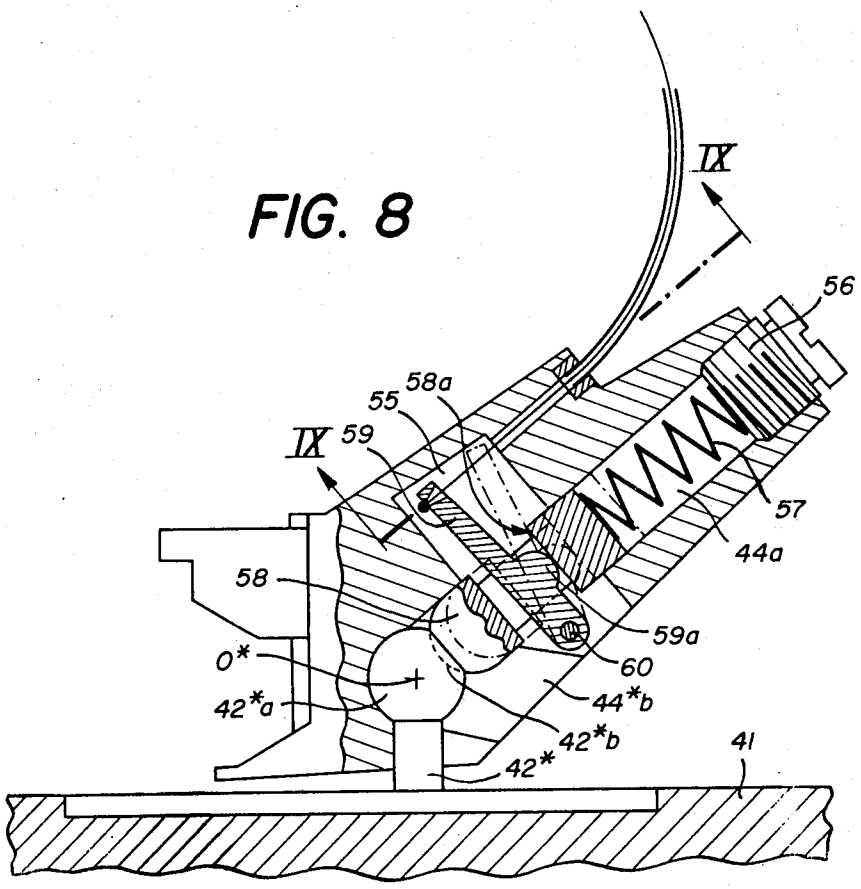


FIG. 7

FIG. 8


IX
56
58a
55
59
IX
57
44a
58
59a
60
0*
42*a
44*b
42*b
42*
41

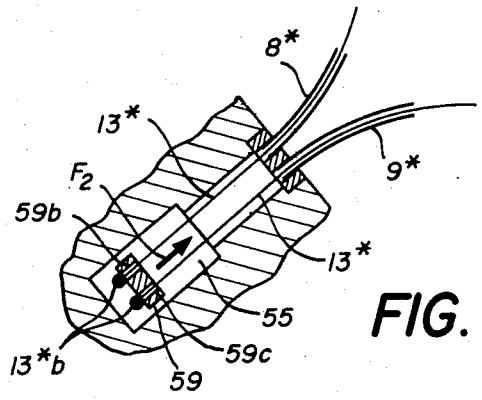

8*
13*
9*
F2
59b
13*
55
59c
13*b
59

FIG. 9

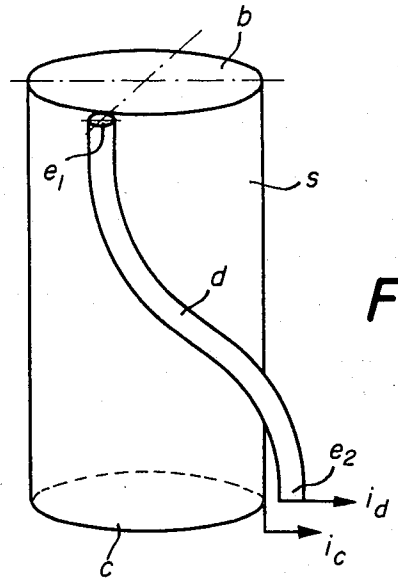


FIG. 10

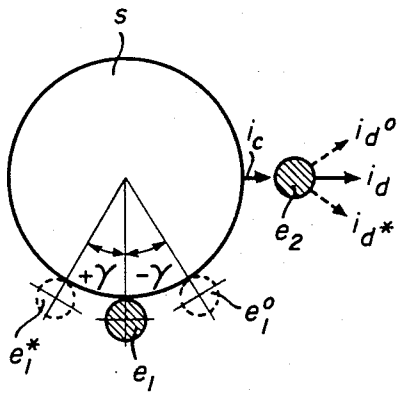


FIG. IIa

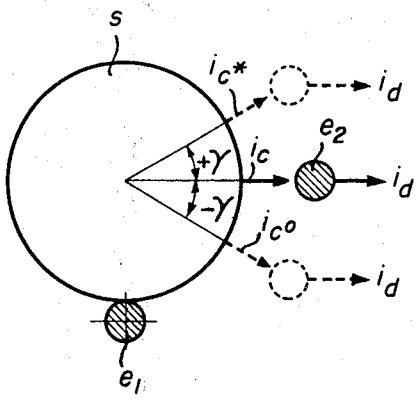
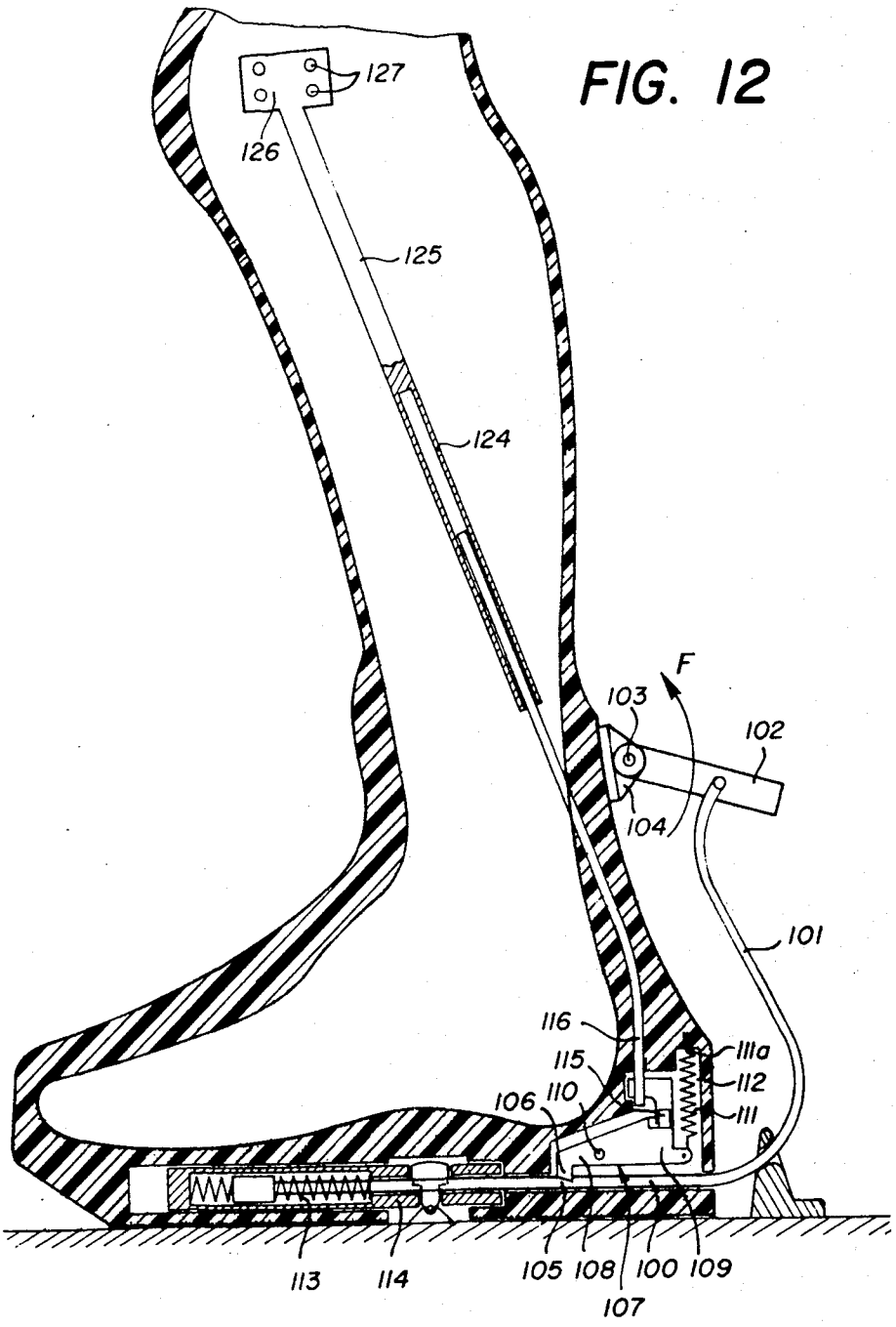


FIG. IIb

FIG. 12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124
F
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111a
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100
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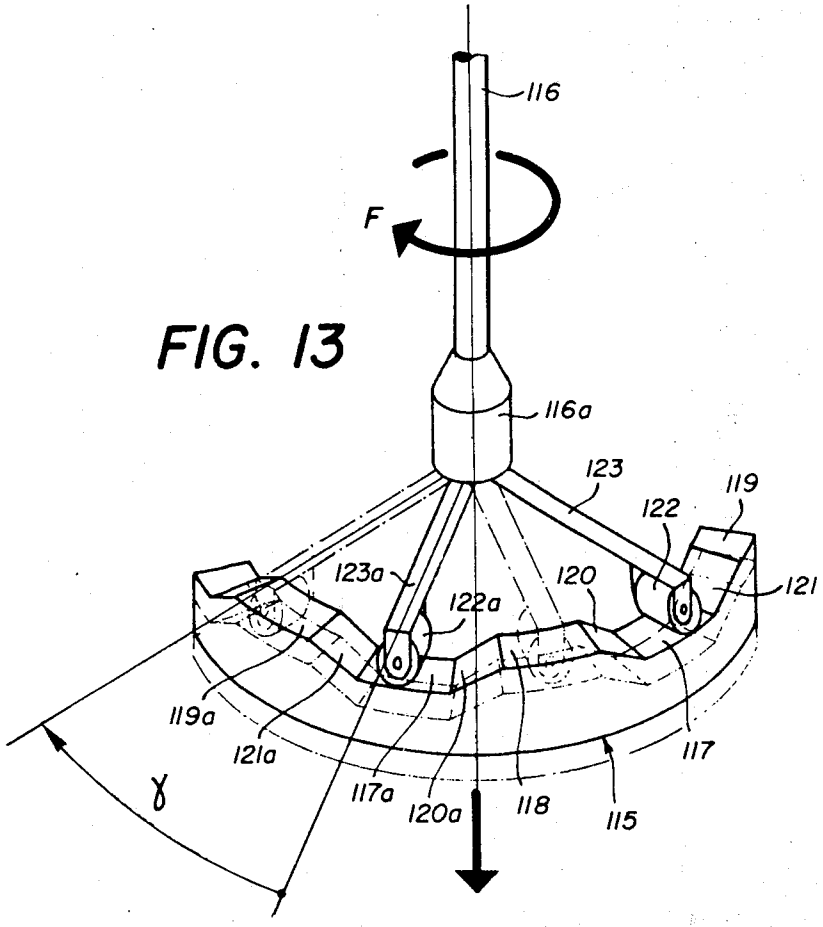
107

FIG. 13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F
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123
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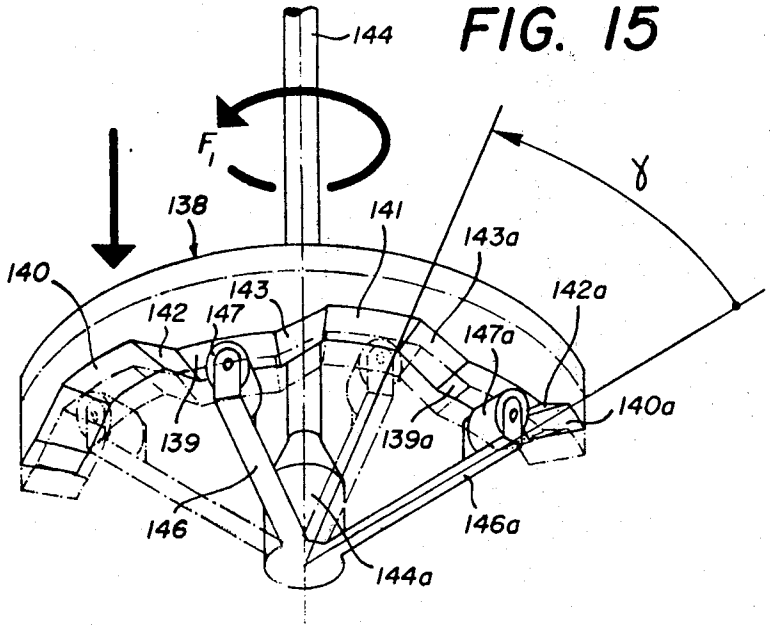
122a
119a
121a
117
117a
120a
118
115
γ

FIG. 15


144
F1
γ
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143a
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147a
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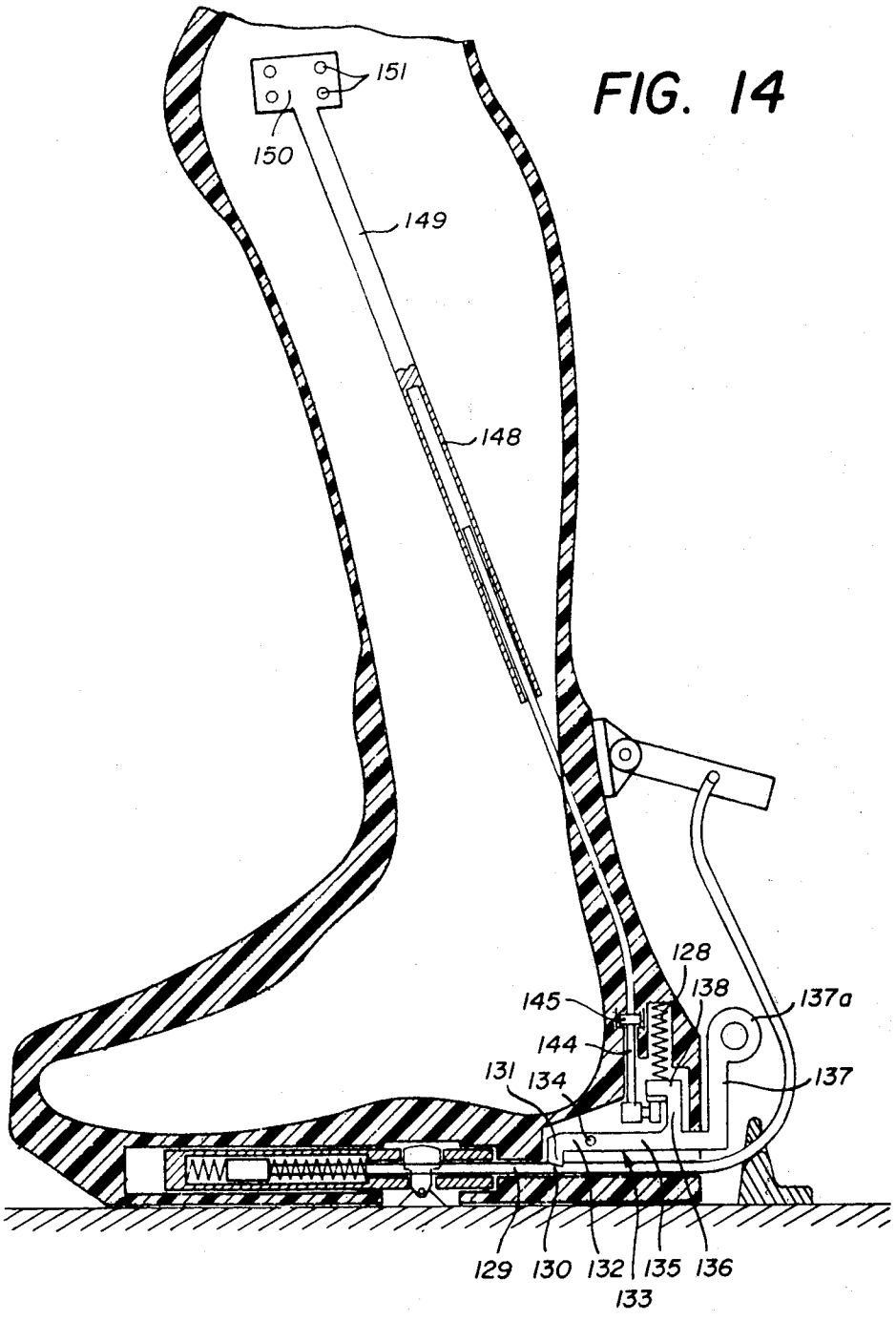
146a
144a

FIG. 14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KNEE TWIST SENSING SKI BINDING

FIELD OF THE INVENTION

The present invention relates to a ski binding. More particularly, this invention concerns a safety ski binding of the type adapted to release the ski when subjected to a predetermined force.

BACKGROUND OF THE INVENTION

Safety ski bindings are known which automatically uncouple the skier from the ski when his leg or foot is subjected to a predetermined stress relative to the ski. Such a binding is provided in order to prevent the relatively long lever arm constituted by the ski from breaking the user's leg, a very common incident prior to usage of such safety ski bindings.

A ski boot is usually secured to a ski in such a manner that it can be disengaged from the ski by forces acting in opposite directions. Thus if a toe or heel of the skier pulls away from the ski with a force exceeding a predetermined limit it is usual for such bindings to release the ski boot. Similarly it is desirable for the ski boot to be released if it is twisted about an axis generally perpendicular to the upper surface of the ski so as to prevent so-called spiral fractures of the leg.

Although it has been found relatively simple by use of springs, small hydraulic dashpots, and the like to provide means for releasing the heel or toe of the ski boot when raised from the surface of the ski, it has been found extremely difficult to provide means which can hold the ski boot securely to the ski during strenuous skiing, but which will release the ski boot when it exerts a twist against the ski binding. This difficulty is principally caused by the fact that the amount of twist which a particular skier's leg can withstand without fracture of any of the lower-leg bones or damage to the ankle or knee joint, is dependent on a great many factors such as the age of the skier, the strength of his joints, and the like. It has, however, been found generally to be the case that the foot of a person cannot rotate relative to the knee of a person about an axis passing upwardly through the lower leg by an angle of more than 25° without some degree of injury to the leg.

This fact has been used in ski bindings wherein locking means securing the ski boot to the ski can be operated by a mechanism actuated through a cable connected to the hips of the skier, thus he wears a sensor at his hips which is connected via a cable to his ski boots so that when his hips assume a predetermined angle relative to the ski boot, the ski boot will be released.

Such arrangements have the considerable disadvantage that the cable follows the leg, thereby passing over the ankle and knee joints, so that when the cable is deformed by bending at the ankles or knees the apparatus becomes almost totally ineffective. Thus it is possible for the skier to bend at the knees and suddenly find that his ski boots have been released from the binding, or similarly for him to be subjected to a sufficient strain to break his leg without his ski bindings releasing. This danger is particularly present when the cable is able to form a loop instead of transmitting a signal to the ski binding. Similarly when the cable is bent over on itself or otherwise kinked, as is the case when the skier is squatting on his skis, displacement of the body in twisting one leg will be read as a dangerous torsion for the other leg and will not be responded to by the correct

ski binding. As a rule such cable-type sensors are almost totally ineffective when the upper and lower legs form an angle of approximately 90°, with one leg twisted relative to the other leg. In this case it is possible for excessive strains to be applied to one or both legs without the apparatus functioning.

OBJECTS OF THE INVENTION

It is therefore an object of the present invention to provide an improved safety ski binding.

Another object is the provision of such an apparatus which will rapidly respond to a torsional stress applied to a skier's leg and cause the corresponding ski boot to be released from the ski.

Yet another object is the provision of such a safety ski binding which is inexpensive to manufacture and simple to adjust.

SUMMARY OF THE INVENTION

These objects are attained according to the present invention in a ski binding comprising releasable locking means for securing a ski boot to a ski, sensor means including a knee-position detector adapted to be secured approximately to the knee of the skier and a foot-position detector adapted to be secured approximately at the foot or ankle of the skier and operating so as to generate an output when the knee and foot regions are twisted relative to each other beyond a predetermined limit, and means interconnecting the sensor means and the locking means for releasing the ski boot from the ski when the sensor produces the output indicating excessive twisting of the foot relative to the knee.

In accordance with the present invention the sensor means includes a flexible and elongated element having one end attached approximately at the skier's knee and another end at the skier's foot or ankle to the ski boot. This latter lower end is connected to the locking mechanism which secures the boot to the ski so that when the foot and knee are twisted excessively relative to each other the boot is released and is freed from the ski.

Thus according to the present invention the sensor comprises a pair of like Bowden cables each having a sheath fixed to one side of the skier's knee and to the other side of the skier's foot so that these two sheaths cross over each other, preferably in front of the skier's ankle. The core wires of these Bowden cables are secured at their upper ends to the knee region of the skier and are connected at their lower ends to the locking mechanism of the ski boot. Thus if the knee twists relative to the foot or vice versa the one cable core or the other, depending on the direction of twist, will move within its sheath and operate the locking mechanism once a predetermined twist has been exceeded.

According to a further feature of this invention the elongated sensor elements have a pair of ends which are always at the same angular orientation relative to each other so that when one end is attached to the knee the other end located at the foot will have an orientation exactly corresponding to the angular position of the knee relative to the foot. Once again this lower end is connected to the lock-operating mechanism so as to trip it and open the latch, thereby freeing the ski boot from the ski.

The arrangement in accordance with the present invention is built into a conventional ski boot and a legging which surrounds the lower leg, that is the calf and

ankle region of the skier, and encloses the knee of the skier.

In accordance with this invention the legging is provided with a pocket at the knee which is adapted to be filled with a hardening synthetic-resin foam so as to permit a custom fit of this knee portion to the individual skier. The boot is similarly provided with fillable pockets so as to allow to be custom-fitted to the skier's foot.

BRIEF DESCRIPTION OF THE DRAWING

The above and other objects, features, and advantages will become more readily apparent from the following, reference being made to the accompanying drawing in which:

FIG. 1 is a schematic view illustrating the operation principles of the apparatus according to the present invention;

FIG. 2 is a perspective diagrammatic view illustrating the apparatus in accordance with this invention;

FIG. 3 is a vertical section through the arrangement according to the present invention;

FIG. 4 is a perspective view illustrating features of the apparatus according to the present invention;

FIG. 5 is a vertical section through another arrangement according to this invention;

FIG. 6 is a section taken along line VI—VI of FIG. 5;

FIG. 7 is a view similar to FIG. 6 illustrating the apparatus in another operative position;

FIG. 8 is a view similar to FIG. 6 illustrating a further arrangement in accordance with the present invention;

FIG. 9 is a section taken along line IX—IX of FIG. 8;

FIG. 10 is a schematic view illustrating the operation principle of yet another arrangement in accordance with this invention;

FIGS. 11*a* and 11*b* are further schematic views illustrating the operation of the apparatus illustrated schematically in FIG. 10;

FIG. 12 is a vertical section through an apparatus embodying the principles shown in FIG. 10;

FIG. 13 is a large-scale perspective view of a detail of the apparatus of FIG. 12; and

FIGS. 14 and 15 are views corresponding to FIGS. 12 and 13, respectively.

SPECIFIC DESCRIPTION

FIG. 1 shows a cylinder *s* serving schematically to illustrate the lower leg of a skier. This cylinder *s* has an upper end *b* corresponding to the knee region of the leg and a lower end *c* corresponding to the foot and ankle region thereof. A limitedly extensible and compressible tube *g* extends generally helically from one end of this cylinder *s* to the other, being attached at a point *p* at the end *c* and at a point *q* at the end *b*. A flexible but axially inextensible core wire *f* is received within the sleeve *g* and has an upper end attached at a point *q* to the upper end *b* of the cylinder and a lower end which extends from the tube *g* at *p* by distance equal to l_1. Another tube *g** is attached at the upper end *b* of the cylinder *s* at a point P_1 and has a core *f** extending below the lower end *c* of the cylinder *s*. The cores *g* and *g** are of opposite helical hand and have their ends spaced angularly apart by an angle γ equal to approximately 160°, drawn to the central axis *a* of cylinder *s*.

When the upper end *b* of the cylinder *s* is twisted in a direction T relative to the lower end *c* the core *f* will retract within sleeve *g* by a distance equal to Δl. Thus the sleeve *g* will assume the position indicated by dashed line *g'* and the point *q* will move through a distance *d* to position *q'* on the end *b*. Similar twisting in the opposite direction as illustrated by arrow T' will move the other core *f** similarly. Thus twisting of the ends *b* and *c* of the cylinder *s* relative to each other will retract one or the other of the cores *f* or *f** within its respective sleeve.

FIGS. 2, 3 and 4 show a ski boot 1 and a legging 2 which are interconnected in an accordion-pleated ankle region 3 by a hinged member 4 on boot 1. The legging 2 is of flexible material and is provided in the back with a slit 2*a* which is closable by means of a slide fastener 7. The boot 1 is formed with a plurality of pockets adapted to be filled with a synthetic-resin foam 5 and the knee region of the legging 2 is adapted to be filled with a semi-rigid synthetic-resin body 6 similarly so as to custom fit the apparatus according to the present invention both to the foot and the knee of the user.

A pair of like Bowden-type cables 8 and 9 each extend from the respective side of the knee insert 6 across the shin and to the back of the boot 1. The insert 6 is split in back at 6*a* so as to permit the shoe to be fitted around the calf and the knee of the skier. Each of the sleeves 8 and 9 is provided with a respective inextensible core wire 13 connected via a bracket 10 to the knee insert 6 and the core 13 is connected to a riveted plate 14' carried on this insert. The lower ends of the tubes 8 and 9 are anchored at 11 on the boot 1.

Both of these cores 13 are connected to a common pin 14 slidable in a plate 15 in boot 1 and pushed downwardly from this plate 15 by a compression spring 16. The lower end of the pin 14 is engaged in one arm 17 of a two-arm lever L pivoted at 18 in boot 1 and having another arm 20 formed with a nose 20*a* engageable in a notch 21 of an actuating rod 22 of the locking mechanism for the boot 1. The boot 1 is formed with a generally square recess 12 in which the upper end of the rod 14 and the ends of the cores 13 are received so as to permit the operation thereof.

One end of the rod 22 is provided with a flexible cable 25 threaded through an eye 33 carried on the ski 32 and having an end received in a lever 35 pivoted at 35* on the back of the boot *d* at 37. This lever 35 allows the rod 22 to be pulled back so that the nose 20*a* can engage in the notch 21. At the same time this cable 25 serves to secure the boot 1 to the ski 32, so as to eliminate the conventional lanyard that prevents the ski from escaping from the skier should he have a fall. A lever 19 is provided on the lever arrangement L so as to permit manual actuation of this lever arrangement L and freeing of the rod 22.

The sole 24 of the boot 1 is formed with a parallelepipedal chamber 28 terminating near the toe region 29 of the boot 1. The forward end 31 of the rod 22 carries a piston-like mechanism 30 received in a chamber 27*a* in a parallel epipedal body 27 in the chamber 28. The chamber 27*a* is provided with a spring 31*a* to one side of the piston 30 and a spring 31 to the other side thereof. The end 27*b* of the body 27 engages under the head 34*a* of a locking element 34 carried on a shaft 36 extending between two ears 37 on the ski 32. To the other side of this element 34 there is provided another block 36 so that this element 34 may be captured and securely held between these two elements 26, 27 so as to secure the boot 1 to the ski 32. When the nose 20*a* engages in notch 21 as shown in FIGS. 2 and 3 the

spring 31 forces the end 27*b* with considerable force against the element 34. When, however, the nose 20 *a* does not engage the notch 21 it is possible for the block 27 to slide in the chamber 28 toward toe 29 and therefore free the elements 34, allowing the boot 1 to pull off the ski 32.

Thus it should be clear that in use, if the knee section 6 is twisted beyond a predetermined extent to either side relative to the foot 1, one of the core wires 13 will pull pin 14 up, thereby pivoting the lever arrangement L about its transverse axis 18 and freeing the rod 22. This will have the immediate effect of unlatching the locking element 34 from between the end 27*b* of the element 27 and the nose 26*a* of the element 26, thereby allowing the boot to slip off the ski 32. As the skier dons the ski he threads the cable 35 through the eye 33 and connects the ends of the cable 25 to the lever 35. Then he fits boot 1 over the locking member 34 and pulls up lever 35 so as to press the block 27 against the latching element 34 and to engage the nose 20*a* in the latch 21.

The arrangement shown in FIGS. 5–7 is similar in principle to that of FIGS. 1–4, except that here a heel or toe clamp of conventional design is operated by a pair of Bowden-type cables 8* and 9* each having a core 13* connected at the knee much as shown in FIGS. 1–4. The ski 41 is provided with a plate 40 carrying a rod 42 having a spherical head 42*a* with a center 0 and formed with a semispherical recess 42*b*. A clamping body 44 is formed with a pair of circular-section boards 44*a* and 44*b* which meet at a common point and have a semispherical base whose center of curvature can correspond as shown in FIGS. 5 and 7 to the center 0 of head 42*a*.

This clamping body 44 is provided with a lower pedal jaw 45 and an upper latching jaw 45*b* so that the skier need merely step on the lower jaw 45*a* so as to pivot the entire body 44 down and lock his heel or toe in place with the upper jaw 45*b*.

A piston 43 slidable in bore 44*a* has a head snugly receivable in the recess 42*b* and is urged by a spring 46 bearing against a cup 47 in bore 44*a*. This piston 43 therefore defines a stable position of the body 44 relative to the ski 41 so as to lock it in place in this position. Of course as is known the force of spring 46 can be overcome by an upward force against the jaw 45*b* so as to release the skier's boot, should his toe or heel exert excessive upward force on this jaw 45*b*.

The cup 47 is slidable piston-fashion in the bore 44*a* and is formed with a ridge 47*a* which can engage a lever 48 pivoted at 49 in a recess 50 formed in the body 44. This lever 48 has another arm formed with a pair of bores 48*a* and 48*b* which, as shown in IFG. 6, receive the cores 13*. Balls 13*a* on the end of core 13* assure that displacement of the core 13* in direction F_1 against the force of respective springs 51*a* and 51*b* will tip the lever, thereby pulling it into the position shown in FIG. 17. A loading lever 52 has a first arm 52*a* lying atop the body 44 and a second arm 52*b* provided with an end 52*c* that can engage against the upper end of the cup 47 as shown in dot-dash lines in FIG. 5 so as to displace cup 47 down into the illustrated position. A tension spring 54 engaged between a pivot 54*a* on the body 44 and the end 52*c* of the lever 52 serves to pivot this lever about its axis 53 into the solid-line position of FIGS. 5 and 7.

Thus once the mechanism has been operated as shown in FIG. 7 to free the toe of the ski boot, the skier can reset it simply by pulling up the lever 52.

The arrangement of FIGS. 8 and 9 is similar in concept to that of FIGS. 5–7. The ski 41 is again provided with a stem 42* having a head 42**a* with a center 0* and formed with a recess 42**b*. This head 42**a* is received in a hole 44**b* in the mechanism and a piston 58 has a head adapted to be received in the recess 42**c*. This piston 58 is slidable into bore 44*a* and is pressed by a spring 57 against the head 42**a*. A tension screw 56 threaded into the end of the bore 44*a* varies the spring pressure and therefore the resistance to displacement from the illustrated position of the mechanism.

Piston 58 is formed with a throughgoing hole 58*a* through which engages a lever 59 pivoted to one side of the piston at 60 and having a boss 59*a* engageable with one side of bore 58*a* so as to displace the piston 58 on pivoting backwardly away from the ball head 52**a* as shown by dot-dash line. The two Bowdens 8* and 9* have their cores 13* passing through holes 59*b* and 59*c* in the lever 59 and provided at the opposite side thereof with lead balls 13**d* so that displacement of these two cores 13* in the direction of arrows F_2 will move the piston 58 and the ballhead 52**a* out of contact with each other and thereby allow the ski boot to be lifted away from the ski 41.

FIGS. 10, 11*a* and 11*b* illustrate another arrangement according to the present invention using the same cylinder *s* employed in the description of FIG. 1. In this arrangement, however an elongated sensor element *d* is provided which has an upper element e_1 secured at the upper end *b* of the cylinder *s* and a lower end e_2 secured at the lower end *c* of the cylinder *s*.

The element *d* is flexible. However its ends d_1 and d_2 cannot be twisted or deflected angularly relative to each other so that even when the element *d* is bent the angular orientation of, for instance, an imaginary line on one end e_1 bears the same relationship to a similar line on the other end e_2.

The upper end e_1 is rigidly fixed to the upper end *b* of cylinder *s*. End e_2 however, can rotate about its own axis relative to cylinder *s*. In this manner, as will be described below, the orientation of the lower end e_2 to the lower end *c* of the cylinder *s* is the same as the orientation of the upper end *b* of the cylinder to the lower end *c* thereof.

As shown in FIG. 11*a*, if the upper end *b* is displaced through an angle of $^{-}\gamma$ so that the end e_1 lies in a position $e_1°$ or is displaced through an angle of $^{+}\gamma$ so that it lies in a position corresponding to e_1* the lower end *e* will be displaced so that an imaginary arrow i_d fixed radially on this end will move into positions $i_d°$ or i_d*, respectively. These positions at the lower end e_2 correspond exactly to the positions of the upper end *b*.

When, as shown in FIG. 11*b*, the lower end *c* is twisted relative to the upper end through angle $^{+}\gamma$ or $^{-}\gamma$ an imaginary arrow i_c fixed radially at lower end *c* moves between a position of i_c* and $i_c°$, respectively, the imaginary line i_d of the lower end d_2 is not displaced angularly on this lower end. This is true even though the lower end e_2 is moved around the central axis of the cylinder *s*.

This is carried out in practice as shown in FIGS. 12 and 13 in an arrangement substantially identical to that of FIGS. 1–4, but wherein the elongated sensor element

is attached at its upper end near the knee of the skier by a plate **126** secured by rivets **127.** This element comprises an upper part **125** formed with a polygonal-section core **124** in which a lower element **116** telescopes. Both of these parts **125** and **116** are flexible but have ends which cannot be twisted readily angularly relative to one another so that a twist at the upper end of element **125** is transmitted directly to the lower end of element **116.**

In this arrangement an operating rod **100** is connected via a cable **101** to a lever **102** pivoted at **103** on a fulcrum **104** on the boot which serves to operate via spring **113** a clamping element **114** similar to that described in the abovd-mentioned embodiment.

The rod **100** is formed with a notch **105** in which fits a tooth or nose **106** of a lever **109** pivoted in the booth at **110** and urged down to the notch **105** by means of a tension spring **111** secured in the boot at **111***a* and received in a hole **112.**

FIG. **13** shows in more detail the lower end of the element **116** shown to have a radially projecting collar **116***a* adapted to prevent the element **116** from being pushed up in the boot and from which extends a pair of like arms **123** and **123***a* carrying respective rollers **122** and **122***a*. These rollers normally lie on respective planar surfaces **117** and **117***a* of a semicircular cam **115** provided on the upper side of lever **109.** When rotated as shown by arrow F the roller can ride from surfaces **117** and **117***a* up over inclines **120** and **121***a* onto surfaces **118** and **119***a*. This presses the end of lever **109** down so as to lift the nose **106** from the notch **105.** Similarly displacement in the opposite direction will displace the rollers **122** and **122***a* up inclined surfaces **121** and **120***a* onto surfaces **119** and **118***a*, respectively. No matter which way the element **116** is twisted this will effect a disengagement of nose **106** from notch **105.** This releases the rod **100** and allows the ski boot to pull free from the ski.

The arrangement of FIGS. **14** and **15** is very similar except that here the lever **135** of the unlatching arrangement **133** has a nose **131** which engages in a notch **130** of an actating rod **129.** In addition this lever is formed at its rear end with an upper arm **137** having an eye **137***a* allowing the lever **135** to have its front arm **132** lifted and the nose **131** disengaged from the notch **130** manually.

The sensor element here has an upper part **149** secured to a plate **150** held via rivets **151** to the knee region of the legging and is formed with a telescoping portion **148** and receives a lower section **144** having a collar **145** to prevent its upward or downward displacement in the boot. In addition the lever **133** has a cam arm **136** carrying a cam **138** normally urged downwardly by a compression spring **128** and formed as shown in FIG. **15** of semicircular shape.

As also shown in FIG. **15** the lower end **144** of the sensor rod has a hub **144***a* carrying a pair of arms **146** and **146***a* carrying respective rollers **147** and **147***a* which normally rest on raised coplanar surfaces **139** and **139***a*, respectively. Between these surfaces are provided coplanar camming surfaces **140, 140***a* and **141.** Inclined regions **142, 143, 143***a* and **142***a* interconnect the lower planar regions. Thus when the lower end **144** is rotated as shown by arrow F_1 the rollers **147** and **147***a* are displaced from the regions **130** and **139***a* and ride over the inclined region **142** and **143***a* onto the other regions **140** and **141** so as to allow the cam **138** to drop, thereby lifting the nose **131** from notch **130** allowing the boot to be freed from the ski.

The arrangement according to the present invention therefore insures that the boot will be released from the ski whenever the skier's leg is stressed torsionally, that is when the foot is twisted relative to the knee to an extent which would result in injury. It provides a safety feature which, in addition to the normally known release-type ski binding, almost completely avoids the possibility of a leg fracture in skiing.

We claim:

1. A safety ski binding comprising:
a ski boot adapted to receive the foot of a skier;
latch means for releasably securing said boot to a ski;
a sensor means having one portion carried at the knee region of said skier and another portion carried at the foot region of said skier adapted to sense relative movement of the two said portions; and
operating means connected between said sensor means and said latch means for operating same and releasing said boot from said ski when said knee and foot regions are angularly offset to each other about an axis passing through said regions to an extent exceeding a predetermined limit.

2. The ski binding defined in claim **1** wherein said sensor means including an elongated flexible element having one end constituting said one portion and another end constituting said other portion and connected to said operating means.

3. The ski binding defined in claim **2,** further comprising means for securing said one end to said knee region and for securing said other end to said foot region.

4. The ski binding defined in claim **2,** further comprising a second such sensor element having its one end secured to one side of said knee region and its other end passing over to the other side of said foot region, the first-mentioned sensor element having its one end secured to the other side of said knee region and its other end passing over to the one side of said foot region.

5. The ski binding defined in claim **4** wherein said elements each include a tubular and flexible extensible sheath and an inextensible and flexible core received within said sheath, said cores being fixed at said one ends at said knee region and being secured at said other ends to said operating means.

6. The ski binding defined in claim **5** wherein said operating means includes a pivotal lever assembly having one lever arm secured to said cores.

7. The ski binding defined in claim **3** wherein said element is flexible and said ends are angularly fixed relative to each other, said one end of said element being angularly fixed at said knee region and said other end being angularly displaceable relative to said binding at said foot region, whereby the angular orientation of said other end relative to said binding at said foot region corresponds to the angular position of said knee region relative to said foot region.

8. The ski binding defined in claim **7** wherein said operating means includes a pivotal lever assembly having one lever arm formed with a cam engageable with said other end.

9. The ski binding defined in claim **8** wherein said other end carries a radially projecting arm and a roller on said arm engaging said cam.

10. The ski binding defined in claim **3** wherein said latch means includes a slidable body formed with a notch and said operating means includes a pivotal lever assembly connected to said element and having a nose engageable in said notch for preventing sliding thereof.

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