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Pauls

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[54] **SKI EQUIPPED CRUTCH**

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[51] **Int. Cl.**..... **A63c 11/22**

[58] **Field of Search**..... 280/11.39, 11.37 C, 280/11.37 J, 11.37 B, 124 A, 16, 11.13 Z; 135/47, 53, 58, 62, 47.5

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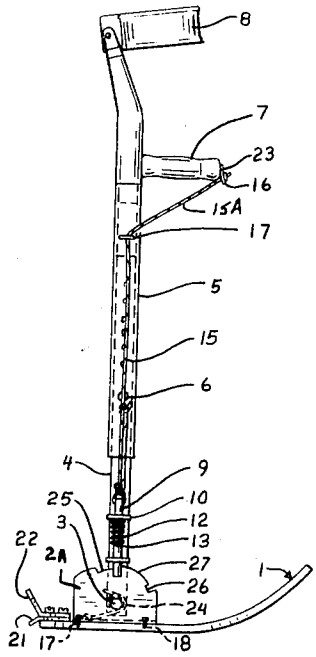
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Primary Examiner—Leo Friaglia
Assistant Examiner—David M. Mitchell
Attorney—Dugger, Peterson, Johnson & Westman

[57] **ABSTRACT**

A ski equipped forearm crutch that converts from a downhill skiing aid to a walking aid by rotating the ski from a horizontal (skiing) position to a vertical (walking) position. A latch controlled remotely from the hand grip locks the short ski in the vertical position enabling the user to support his weight upon the rear end of the ski. A skid resistant member is attached at the rear of the ski to further aid walking on slippery surfaces such as packed snow or ice. A claw-like member, also fixed to the rear of the ski is employed as a means of acting as a brake to slow down a moving skier by rotating the ski to a position in which only the rear of the ski contacts the snow surface thereby causing the claw to dig into the snow surface and cause a retarding force.

7 Claims, 5 Drawing Figures



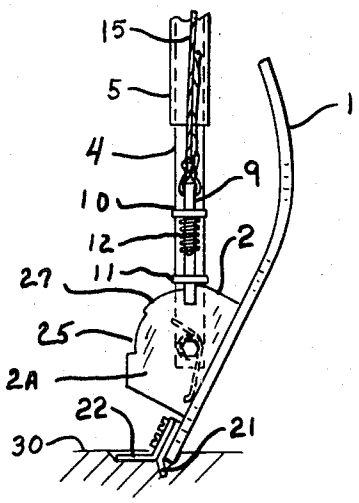


FIG. 3

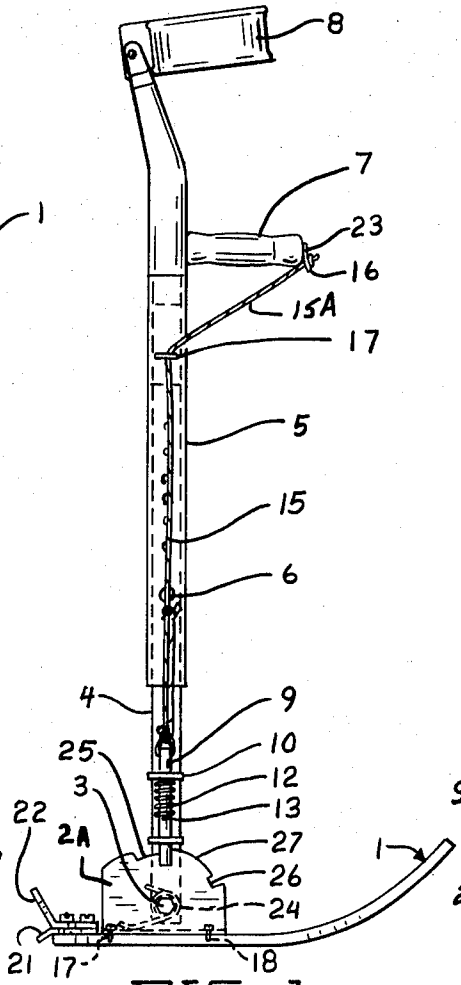


FIG. 1

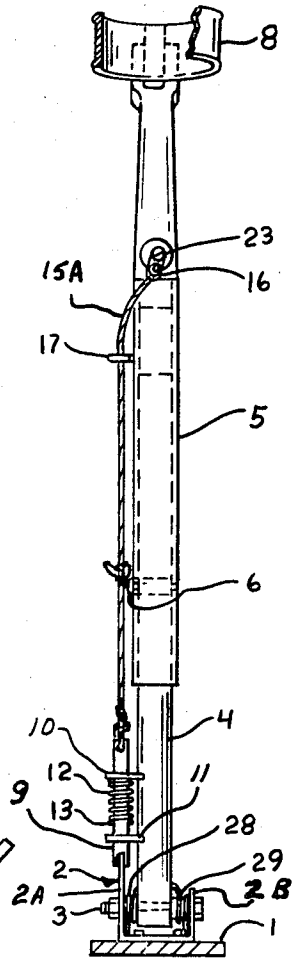


FIG. 2

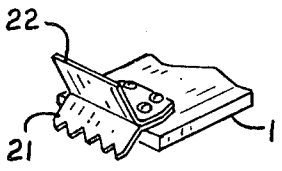


FIG. 4

FIG. 5

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SKI EQUIPPED CRUTCH

BACKGROUND OF THE INVENTION

People that have only one leg or disabled legs who participate in the sport of snow skiing usually use ski equipped crutches known as crutch skis, to give them support and stability while pursuing this activity. Prior to this invention crutch skis were cumbersome to use when walking about because of the slipperiness of their bottom surface and also because the necessary length of the ski is very awkward to maneuver while walking up or down a stairway or in crowded areas. Prior crutch skis sometimes employed a spike-shaped member that could be made to protrude through the bottom of the ski to provide a resistance member to resist skidding while using the crutch ski for walking. However, the spike is difficult to extend and retract, and the length of the ski was not reduced, thereby making walking more difficult than with a conventional forearm crutch not equipped with a ski.

Prior to this invention it was also difficult for a slow moving handicapped skier using one conventional ski on one leg and ski equipped forearm crutches to retard his velocity down a ski slope. At high speeds it is quite easy to turn the conventional snow ski perpendicular to the direction of travel to effect a retarding force. However, at slow speeds, turning the conventional ski is more difficult and to effect a retarding force without turning the conventional ski the handicapped skier must turn the short crutch skis on the arm crutches at an angle to his direction of travel in order to effect a retarding force by dragging the crutch ski edges on the snow. This maneuver is difficult because skis tend to slide in their longitudinal direction and because when trying to retard speed the longitudinal direction of the crutch skis is not the direction of the skiers movement, the crutch skis tend to slew to either side of the skier thereby making balancing on the one conventional ski difficult for the skier.

Examples of prior art patents include U.S. Pat. No. 3,421,773 and U.S. Pat. No. 3,273,575.

SUMMARY OF THE INVENTION

The present invention relates to a ski equipped crutch that easily converts to use for walking. The crutch further includes means to permit use of the ski crutch to retard speed of the skier if necessary. The conversion of the crutch ski from a downhill skiing aid to a walking aid (or for use as a conventional ski pole) is quickly done by the user merely by pulling a release device. The ski is spring loaded to its walking position and will automatically go to this position when the release is tripped. The release locks the ski in the walking position for safe reliable use. By again tripping the release member and overcoming the spring force the ski is quickly moved to its skiing position.

An object of this invention is to present a crutch ski device which makes walking with ski equipped crutches no more difficult or restricted than walking with conventional crutches not equipped with skis.

A further object of this invention is to provide an easily controlled means of retarding the forward velocity of a skier using crutch skis.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation of a crutch ski constructed according to the present invention;

FIG. 2 is a rear elevational view of the crutch ski shown in FIG. 1;

FIG. 3 is a fragmentary side elevational view of the crutch ski of FIG. 1 showing the ski rotated into the vertical walking or ski pole position;

FIG. 4 is a fragmentary rear perspective view of the braking device located on the rear end of the ski; and

FIG. 5 is a side elevational view of the device of FIG. 1 showing the crutch ski positioned in the braking mode of operation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the accompanying drawings which form part of this disclosure, a short length of ski **1** is attached to a yoke **2** that has a pair of upstanding legs **2A** and **2B** by the means of screws **17** and **18.** The crutch assembly combines an outer crutch shaft **5** that mounts a telescoping tube **4.** A pivot shaft **3** is mounted on the legs **2A** and **2B** of the yoke **2** and passes through a provided hole in tube **4,** so that the tube **4** and ski **1** can pivot relative to each other. Spacers **28** and **29** provide axial positioning of tube **4** with respect to the legs of yoke **2.** The tube **4** is held in longitudinally spaced along shaft **5.** The crutch shaft **5** and tube **4** are a conventional assembly used on arm crutches for length adjustment. The shaft **5** mounts a crutch handle **7** and forearm cuff **8** which are common to most commercially available forearm crutches.

A latch pin **9** is slidably mounted in provided holes in a pair of brackets **10** and **11** which are affixed to lower tube **4** and extend to one side thereof. A compression spring **12** encircles latch pin **9** and is restrained on its upper end by bracket **10** and on its lower end by a pin **13** in latch pin **9.** The spring **12** urges latch pin **9** downward into engagement with the upper edge of upright leg **2A** of yoke **2** which has notches **25** and **26** defined therein and which are of size to receive the latch pin **9.** The latch pin is bifurcated so that the end is guided on opposite sides of leg **2A.** The leg **2A** has a top edge formed in an arc to form a shaft control quadrant structure.

A cord **15** is secured on its lower end to latch pin **9** by passing the cord through a hole in latch pin **9** and tying the cord back upon itself. The cord can be adjustable in length to fit different lengths of the telescoping shafts. The shaft **5** and tube **4** are shown collapsed and they can be lengthened substantially for proper length. The upper part of cord **15** passes through a guide eye **17** fixed to crutch shaft **5** and the cord is then tied to cord anchor **16** which is secured to crutch handle **7** by the means of a screw **23.**

A double coiled torsion spring **24** is mounted over the spacers **28** and **29.** That length of the double torsion spring **24** connecting the two coils of torsion spring **24** is restrained by lower tube **4.**

The two legs of double torsion spring **24** rest against the cross member or base of the yoke **2** as shown in FIG. **1** in dotted lines. The action of double torsion spring **24** is to continuously urge yoke **2** to rotate with respect to lower tube **4** into a position in which ski **1** is most nearly parallel to tube **4** as illustrated in FIG. **3.** The latch pin **9** cooperating with slots **25** or **26** will act to hold the ski in the desired rotational position with respect to tube **4.** The user of the crutch ski controls the rotational orientation of the ski with respect to the

crutch shaft without removing his hand from crutch handle 7.

The ski 1 may be rotated from the skiing position as illustrated in FIG. 1 to the walking position as illustrated in FIG. 3, by lifting the entire crutch ski from the snow surface and then by the user extending his fingers downward and around that part 15A of cord 15 which lies directly under crutch handle 7 and then, by pulling upward on that portion of cord 15, so that upward motion will be imparted to latch pin 9. The upward travel of latch pin 9 is great enough to allow the lower end of latch pin 9 to clear detent portion 27 of the leg of yoke 2 between notch 26 and notch 25. Double torsion spring 24 then causes yoke 2, together with ski 1, to rotate to the walking position as illustrated in FIG. 3. The leg of yoke 2 has a stop end portion 26A that engages the pin 9 even when it is lifted. The user then releases cord 15 and the compression spring 12 causes latch pin 9 to move downward into notch 26 thereby locking ski 1 into a fixed position with respect to crutch shaft 5. The notch 26 prevents pivoting of ski 1 in either direction about pivot shaft 3. To rotate ski 1 back into the skiing position as illustrated in FIG. 1, the user again pulls on cord 15 which causes latch pin 9 to disengage from notch 26 and at the same time the user also pushes downward on crutch handle 7 with enough force to overcome the opposing force of double torsion spring 24. This action causes ski 1 to be rotated from the position illustrated in FIG. 3 to the position illustrated in FIG. 1. The user then releases cord 15 which allows latch pin 9 to engage the elongated notch 25. The ski may then rotate with respect to the crutch to the extent allowed by length of notch 25. This lets the ski 1 move slightly during skiing to pass over uneven snow.

Claw 21 and stop 22 are affixed to ski 1 by the means of screws. The rear end of claw 21 is serrated as shown in FIG. 4 and the points of the serrated portion are positioned slightly beyond the rear end of ski 1 and in approximately the same plane as the running surface of ski 1. Claw 21 is employed as a skid resistant end for ski 1 when the crutch ski is used as a walking crutch and also as a means of braking the users forward velocity when skiing. To employ claw 21 as a brake the user tilts the crutch shaft 5 rearwardly until latch pin 9 engages the end of slot 25 which then tilts the ski 1 to the position illustrated in FIG. 5. This causes ski 1 to ride with only its rear end on the snow 30 thereby causing the serrated points of claw 21 to dig into the snow 30 and cause a retarding force that brakes the skier and aids him in staying in control without tending to slew or slide the ski 1 outwardly.

Stop 22 is affixed to ski 1 by the means of screws 23 and is employed as a means of obtaining a greater surface area to resist penetration of the end of ski 1 into soft surfaces, such as snow, when the ski 1 is oriented in the walking position as illustrated in FIG. 3.

The unit thus is quickly converted from a skiing aid that helps support and also helps maintain speed of a one legged or otherwise disabled skier, to a walking aid that can be used for support for walking. The claw and stop give positive holding action on ice and snow so the skier can use the device in the manner of a conventional ski pole when the skier is walking on skis, as well as when the skier has removed his skis.

The automatic movement of the ski to the walking aid position makes the conversion simple and quick. The user only has to pull the cord 15 and the torsion spring snaps the ski to walking position. The conversion from walking aid to skiing aid is likewise quickly and easily done by pulling cord 15 to release the latch and then merely pushing down on the ski until it reaches its proper position. The user does not have to lift the device substantially, and the conversion is accomplished with only using one hand and arm so the other hand and arm can be used for balance.

What is claimed is:

1. A ski crutch for use on supporting surfaces comprising a support shank member having grip means to permit control thereof by an arm of a user, a short ski section, said ski section having a running surface, an upwardly curved forward end, and a rear end portion, means to pivotally mount said ski section to said shank to permit movement of said ski section from a first normal position wherein said running surface engages the supporting surface when held by a user, to a second position wherein the forward end extends upwardly adjacent said shank with the rear end portion extending downwardly from said shank, releasable latch means comprising a latch member and latch pin to retain said ski section in said second position, and means mounted adjacent the grip means to permit the user to selectively disengage the latch member and latch pin.

2. The ski crutch of claim 1 wherein said latch member includes an elongated notch permitting travel of said latch pin relative thereto for a preselected amount when the ski is in its first position.

3. The ski crutch of claim 1 and an anti-skid member extending rearwardly from said ski section and positioned to engage the supporting surface for the user when the ski section is in said second position.

4. The combination of claim 1 wherein said grip means includes a hand grip member for a user, and means employable by a hand on said hand grip operable to release said releasable means.

5. The combination of claim 4 and bias means acting between said shank member and said ski urging said ski to said second position.

6. A ski crutch for use on supporting surfaces comprising a support shank member having grip means to permit control thereof by an arm of a user, a short ski section, said ski section having a running surface, an upwardly curved forward end, and a rear end portion, means to pivotally mount said ski section to said shank to permit movement of said ski section from a first normal position wherein said running surface engages the supporting surface when held by a user, to a second position wherein the forward end extends upwardly adjacent said shank with the rear end portion extending downwardly from said shank, releasable latch means to retain said ski section in said second position, including means to limit the amount of pivotal movement between said shank member and said ski section when said ski section is in said first position, and an anti-skid member attached to the rear portion of said ski section and extending rearwardly therefrom, and being above the plane of said running surface of said ski section, said anti-skid member engaging the supporting surface when the forward end of the ski section extends upwardly with the ski section in said second position and the ski crutch is moved to engage the supporting surface.

7. The combination of claim 6 and a stop member attached to said ski section at the rear portion thereof positioned to engage a supporting surface for a user to restrain the rear portion of said ski section from embedding in the supporting surface when the ski section is in said second position and a downward load is placed on said shank.

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