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Negi

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[54] **AUXILIARY SKI FOR PHYSICALLY HANDICAPPED PERSONS**

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[51] Int. Cl. A63c 11/22

[58] Field of Search 135/49, 53, 58, 59; 280/11.37 R, 11.37 B, 11.39

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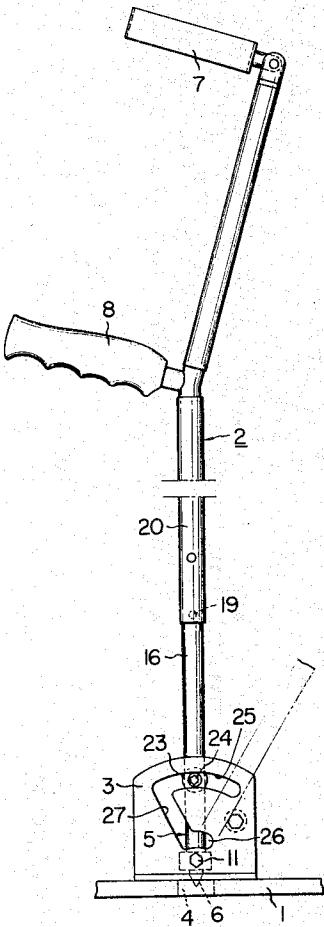
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Primary Examiner—Trygve M. Blix
Assistant Examiner—Stephen G. Kunin
Attorney, Agent, or Firm—Ostrolenk, Faber, Gerb & Soffen

[57] **ABSTRACT**

A novel auxiliary ski for physically handicapped persons, comprising a ski runner having a through hole therein, a pair of guide plate members erected from the ski runner, and a pole rotatably supported between the guide plate members. Each guide plate member has a pair of pole locking slots formed at two different positions in the lengthwise direction of the pole, and a guiding slot connecting the pair of pole locking slots. The pole is lockable at one of the pole locking slots and is movable, along the guiding slot, in its lengthwise direction with respect to the ski runner and further lockable at the other of the pole locking slots, whereby the lowermost tip of the pole can either be retained within the through hole of the ski runner or be protruded through said hole down to below the ski runner.

10 Claims, 4 Drawing Figures

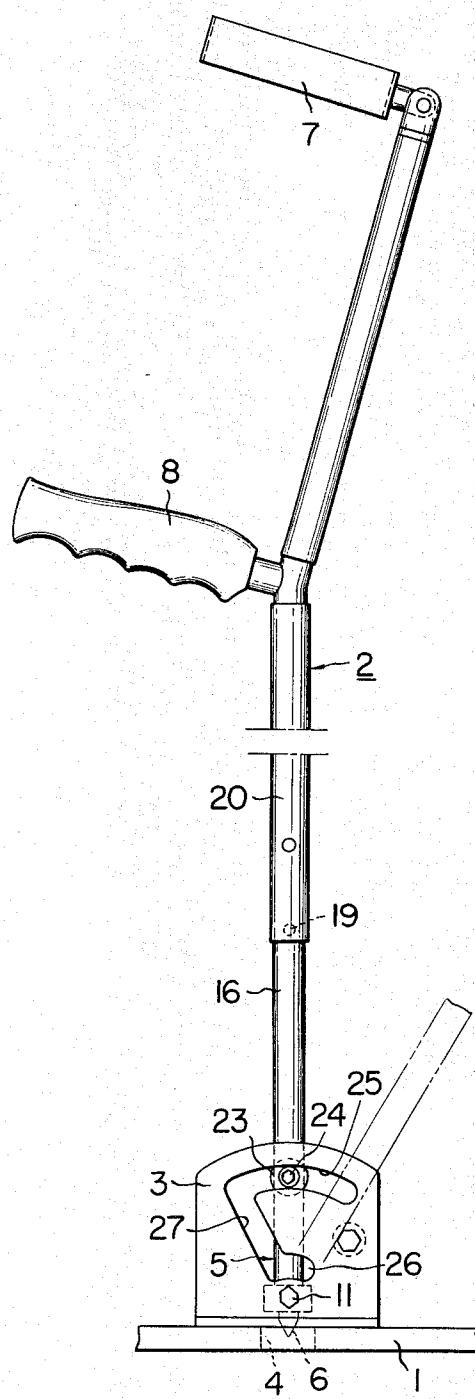


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FIG. 1

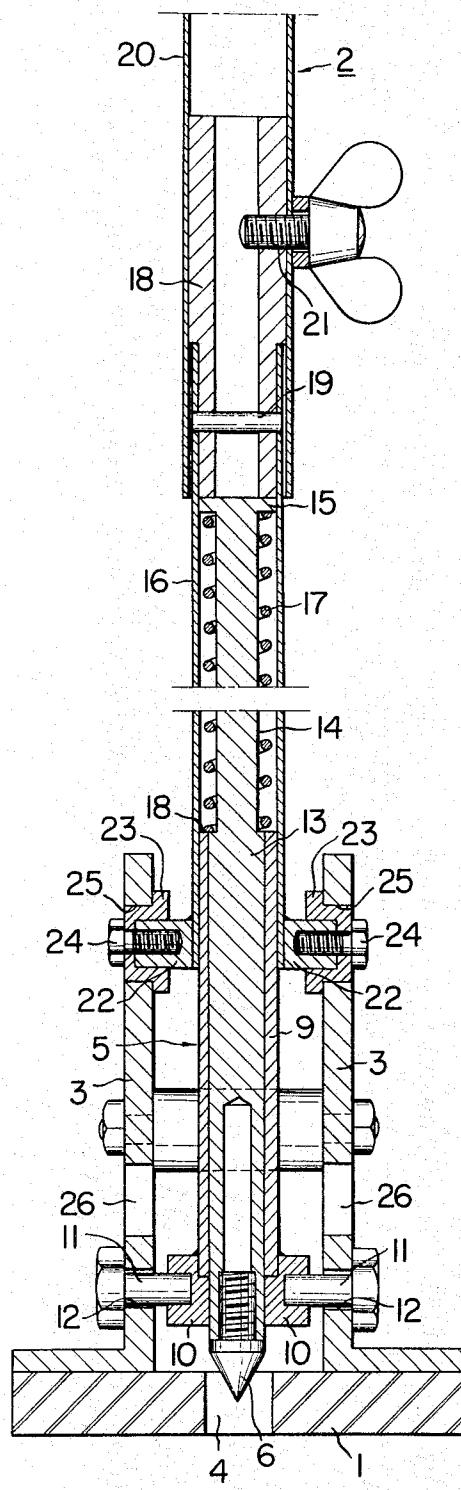


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FIG. 2



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FIG. 3

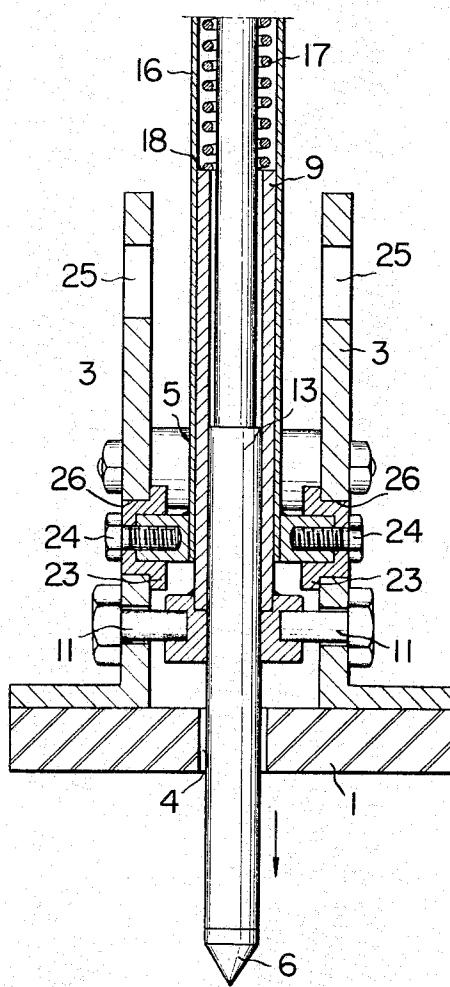
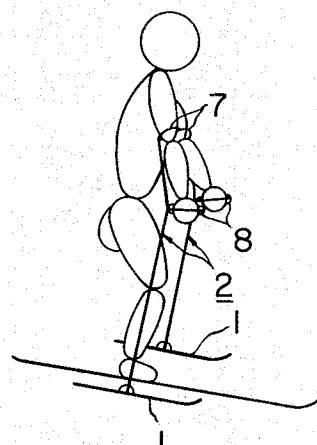


FIG. 4



AUXILIARY SKI FOR PHYSICALLY HANDICAPPED PERSONS

This invention relates to an improved ski for the physically handicapped persons, especially for the one-legged or lame persons. More particularly, the invention relates to a crutch-like ski which is used auxiliarily by such persons.

In recent years, many a kind of sport has become popular among the physically handicapped persons, especially, after the opening of paralympic, International Stoke Mandeville Games. Increasing attention has come to be paid to the sports for such persons as one-armed, one-eyed, one-legged or lame persons using wheel chairs, crutches or the like. As far as the skiing is concerned, however, it has been regarded as impossible for the one-legged or lame persons to ski owing to the difficulties of principle and techniques in the ski running. Accordingly, even when such persons want to do, they can not practise skiing, and it has been beyond possibility to hold a skiing contest.

Therefore, the principal object of the present invention is to answer their hopes by proposing a novel ski. Another object of the invention is to provide an improved ski which can be easily used by the physically handicapped persons such as one-legged or lame persons without any difficult training and handling.

Pursuant to the above-mentioned objects, the ski of the invention comprises a ski runner having a through hole therein, a pair of guide plate members erected from the ski runner, and a pole rotatably supported on the ski runner and between the guide plate members, and movable in its lengthwise direction with respect to the ski runner, each guide plate member having a pair of pole locking slots formed at two different positions in the lengthwise direction of the pole, and further having a guiding slot connecting the pair of pole locking slots, whereby the pole is lockable at one of the pole locking slots and movable, along the guiding slot, in its lengthwise direction with respect to the ski runner and further lockable at the other of the pole locking slots, so that the lowermost tip of the pole can either be retained within the through hole of the ski runner or be protruded through the hole down to below the ski runner. To facilitate the movement of the pole in its lengthwise direction, the pole may be given a biasing force by means such as a coiled compression spring interposed between the pole and the ski runner. This ski can be used auxiliarily like a pair of crutches for the lame persons on the snow. In the running on a descending slope, the lowermost tip of the pole is retained within or above the through hole to keep the smooth running surface of the ski runner; and when walking on a flat or ascending slope, the lowermost tip of the pole is projected below the through hole without any difficult operation so as to enable a usual sticking operation.

These and other features and characteristics of the invention will be explained in more detail in the following with reference to the accompanying drawings in which:

FIG. 1 is a vertical side view of an embodiment of the present invention;

FIG. 2 is a cross-sectional front view of said embodiment showing the relation between the ski runner and the pole;

FIG. 3 is also a cross-sectional front view of said embodiment showing the lowermost end of said pole projected below the ski runner; and

FIG. 4 is a schematic illustration of a man using the skis of the present invention.

Referring now to the drawings, the numeral 1 denotes the middle portion of a ski runner, to which a pole 2 is attached in the substantially vertical direction through a pair of guide plate members 3 mentioned below in detail. In said middle portion 1 of the ski runner, a through hole 4 is formed to receive therethrough the lower portion 5 of said pole 2. The lower most tip of said portion 5 is provided with a ferrule 6, and the upper portion of said pole 2 is provided with an arm

10 ring 7 and a hand grip 8, both of which extend to the forward side of the ski 1, that is, to the left-hand side of FIG. 1. The pole 2 between the arm ring 7 and hand grip 8 is a little inclined to the rear direction and the lower portion 5 of the pole 2 stands vertically upward.

15 The pair of guide plate members 3 are erected from both sides of the middle portion 1 of the ski runner, so that the guide plate members 3 face each other, leaving a space therebetween, as shown in FIG. 2. A pipe 9 is rotatably supported in the space between the guide plate members 3 by means of sockets 10 fixed to the pipe 9 and bolts 11 inserted through holes 12 formed in the lower part of the guide plate members 3, the bolts 11 and sockets 10 being tightly connected together. Thus, the pipe 9 is rotatable about the pivot defined by bolts 11 or tiltable toward both the forward and rearward of the ski runner. The pipe 9 is made open at both ends thereof.

20 The lower portion 5 of the pole 2 comprises a shaft 13 inserted in the pipe 9 and slidably therethrough. The shaft 13 is provided with the above-mentioned ferrule 6 at the lowermost end thereof and has a cutout portion or portion 14 reduced in diameter at the upper section thereof. The cutout portion 14 of the shaft 13 terminates at a flanged uppermost end 15 of the shaft 13. The lower portion 5 of the pole 2 further comprises an intermediate pipe 16, which is telescopically inserted around the pipe 9 and in which the cutout portion 14 of the shaft 13 is encased so as to form a ring-shaped enclosed space or chamber between the cutout portion 14 and the pipe 16. Into the ring-shaped space is housed a coiled compression spring 17, which is abutted on the upper edge 18 of the pipe 9 at its lowermost end and on the flanged end 15 of the shaft 13 at its uppermost end. The intermediate pipe 16 extends above the flanged uppermost end 15 of the shaft 13, and a joint 18 is inserted within the upper portion of the pipe 16. The intermediate pipe 16 and the joint 18 is coupled together by means of a pin 19. The point 18 is further connected to a main pipe 20 by a screw 21.

25 The intermediate pipe 16 is provided with internally threaded sockets 22 at its lower portion, the sockets 22 extending toward the guide plate members 3, respectively. Around each socket 22 is rotatably fixed a flanged guide roller 23 by means of an externally threaded screw 24 tightly screwed into the socket 22. Each guide plate member 3 is perforated with an elongated slot 25, which extends at the upper portion of the guide plate member 3, depicting an arc of a circle having a center at the bolt 11, namely, at a pivot of the rotatable pole 2. The guide plate member 3 is further perforated with a slot 26 existing at the lower portion of the guide plate member 3 and shorter than the slot 25.

The slot 26 also is preferably formed to depict an arc of a circle having a center at the bolt 11. Both of the slots 25 and 26 are interconnected together by a guiding slot 27 extending from one end of the slot 25 down to one end of the slot 26, the slot 27 being directed toward the bolt 11, whereby the slots 25 to 27 form a slotted path along which the roller 23 is guidable.

The above-mentioned guide rollers 23 are fitted in the slotted paths formed by the slots 25 through 27 of the guide plate members 3. When the rollers 23 are in the elongated slot 25, the pole 2 is raised upward and the lowermost tip 6 of the pole 2 is within as above the through hole 4 of the ski runner 1. The pole 2 is rotatable along the elongated slot 25, keeping the state of being raised upward. When the pole 2 is turned forward up to the guiding slot 27 and pushed downward against the biasing force of the coiled spring 17, the rollers 23 are guided along the downwardly extending slots 27 and come to the lower slots 26, simultaneously permitting the lowermost tip 6 of the pole 2 to protrude through the hole 4 down to below the ski runner 1. Then turning the pole 2 in the reverse direction, the rollers 23 are guided in the slots 26 and locked therein, and the state in which the tip of the pole 2 is projected is kept at it is. If it is desired to move back the tip of the pole within or above the through hole 4, the pole 2 is rotated back to the slots 27, whereby the pole 2 is moved upward under the biasing force of the compressed spring 17. Guiding the rollers 23 within the slots 25 permits the pole 2 to be kept raised upward.

The skis 1 having the above-mentioned structure may be used such that, as shown in FIG. 4, a person inserts his arms into the arm rings 7 and grasps the hand grips 8, thus using the skis not only as auxiliary skis but also as ski sticks. In the running on a descending slope, the pole 2 of the ski 1 can be swung before and behind because the rollers 23 of the pole 2 are freely movable within the elongated slots 25. Thereby the pole 2 of the ski 1 can be handled easily as ski sticks of the conventional skis, and the person can easily run on several kinds of slopes and gaps with ease.

Further, on a level snow ground or an ascending slope, the pole 2 is inclined in the front direction and the rollers 23 fixed to the intermediate pipe 16 are slid along the slots 25 to the front end, and then the pole 2 is pushed down to the snow surface against the force of the spring 17. Thereby, the main pipe 20, the intermediate pipe 16 which is connected to said pipe 20 by means of the joint 18, and the shaft 13 having the ferrule 6 at the lowermost end can be lowered, while at the same time, as shown in FIG. 3, the compression spring 17 is pressed as far as the rollers 23 reach the ends of the down strokes of the slots 27. Then the guide rollers 23 are locked within the slots 26, thus the ferrule 6 of the shaft 13 being projected from the hole 4 of the ski 1 and kept as it is. Accordingly, the ski in this condition can be used as the ski stick in like manner as the conventional ones.

As disclosed in the above, when a one-legged person puts his foot on a conventional ski, a pair of the skis of the present invention can be used as auxiliary skis and as ski sticks; accordingly, he may run on the snow without difficulty and danger. In addition to that, when he walks on the snow, the skis of the present invention are provided with the ferrules which are projected from the running surfaces of the skis, by which the person may be very much assisted in the walking.

As will be understood from the above disclosure, the present invention has the advantage that the one-legged or lame person can enjoy himself by skiing with a little and easy training. It should be emphasized, however, that the specific embodiment described and shown herein is intended as merely illustrative and in no way restrictive of the invention.

What is claimed is:

1. A ski comprising: a ski runner having a through hole therein; a guide member erected from said ski runner; a pole next to and tiltably supported with respect to said guide plate member and said pole being movable in its lengthwise direction with respect to said ski runner, said guide plate member having a pair of pole locking slots formed at two different positions in the lengthwise direction of said pole and further having a guiding slot interconnecting said pair of pole locking slots; and guiding means fixed to said pole and movable along said pole locking slots and guiding slot, said guiding means being lockable within said pole locking slots, locking of said guiding means within one of said pole locking slots permitting said pole to be retained in one of its movable positions in the lengthwise direction thereof, locking of said guiding means within the other of said pole locking slots permitting said pole to be retained in another of its movable positions in the lengthwise direction thereof; said tiltable supporting of said pole is effected by rotatably pivoting said pole with respect to the guide plate member about a pivot, and said one of said pole locking slots is located more distant from said pivot of said pole than the other of said pole locking slots, and is elongated and curvedly shaped to define an arc of a circle having a center at said pivot of said pole.

2. A ski as claimed in claim 1, wherein said the other of said pole locking slots is elongated and curvedly shaped to define an arc of a circle having a center at said pivot off said pole.

3. A ski as claimed in claim 1, wherein said guiding slot interconnects one end of said one of said pole locking slots with the other of said pole locking slots, said guiding slot being directed toward said pivot of said pole.

4. A ski as claimed in claim 1, further comprising means for subjecting said pole to a biasing force with respect to said ski runner.

5. A ski as claimed in claim 4, wherein there are two said guide plate members arranged on opposite sides of said pole and having their respective said slots aligned.

6. A ski as claimed in claim 5, further comprising a pole guiding pipe tiltably supported between said pair of guide plate members, said pole being slidably inserted in said pole guiding pipe.

7. A ski as claimed in claim 6, wherein said pole comprises a shaft slidable within said pole guiding pipe and having a portion reduced in diameter, and an intermediate pipe telescopically inserted around said pole guiding pipe, said intermediate pipe surrounding said portion reduced in diameter so as to form a rounded space therebetween, said means for subjecting said pole to a biasing force being housed within said rounded space.

8. A ski as claimed in claim 7, wherein said means for subjecting said pole to a biasing force is a coiled compression spring winding around said reduced portion of said shaft.

9. A ski as claimed in claim 7, wherein said guiding means is fixed to said intermediate pipe.

10. A ski as claimed in claim 1, wherein said pole is of a length to be projectable through said through hole formed in said ski runner, said pole being positioned so as to be above the lower surface of said ski runner when said guiding means is locked within one of said pole

locking slots, and so as to be protruded below said ski runner when said guiding means is located within the other of said pole locking slots.

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