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METHOD FOR MODIFYING CONVENTIONAL SNOW SKIIS TO PERMIT  
DOWNHILL SKIING ON SMOOTH GRASSY SLOPES  
DURING NON-WINTER PERIODS

Filed Sept. 16, 1968

2 Sheets-Sheet 1

FIG. 1

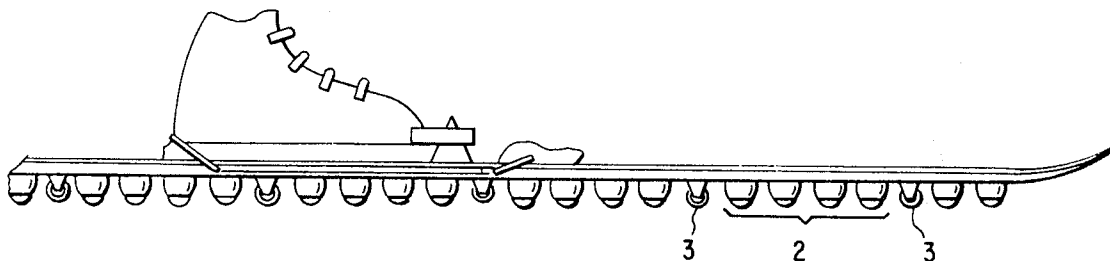


FIG. 2

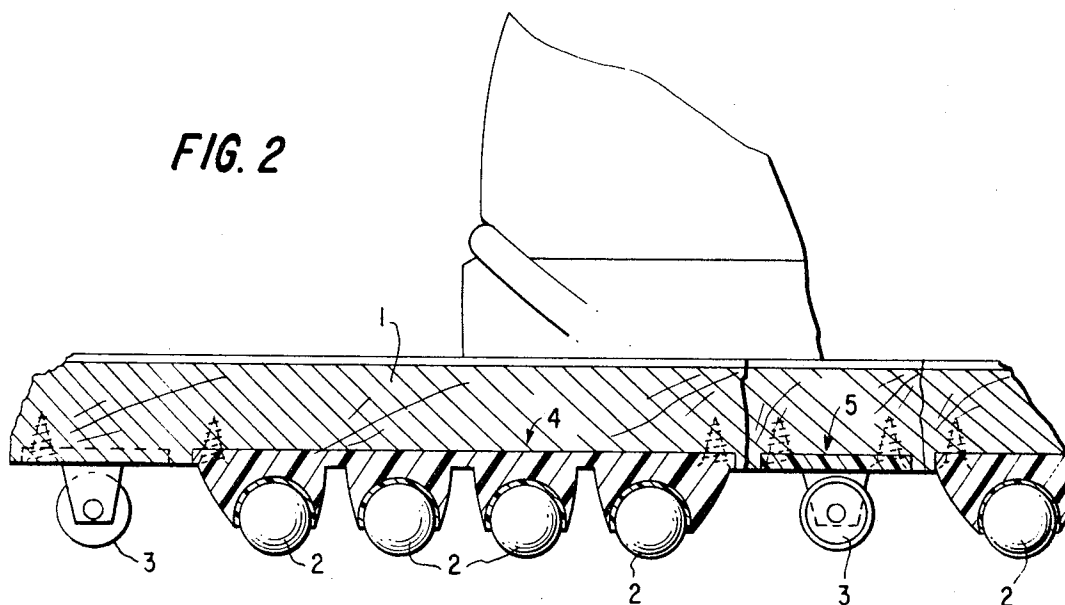
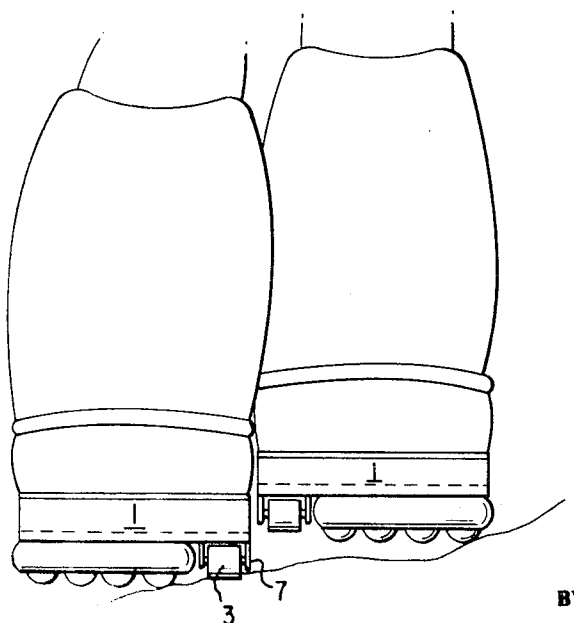


FIG. 5



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FIG. 3

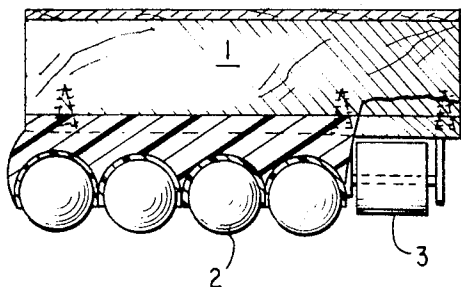


FIG. 4

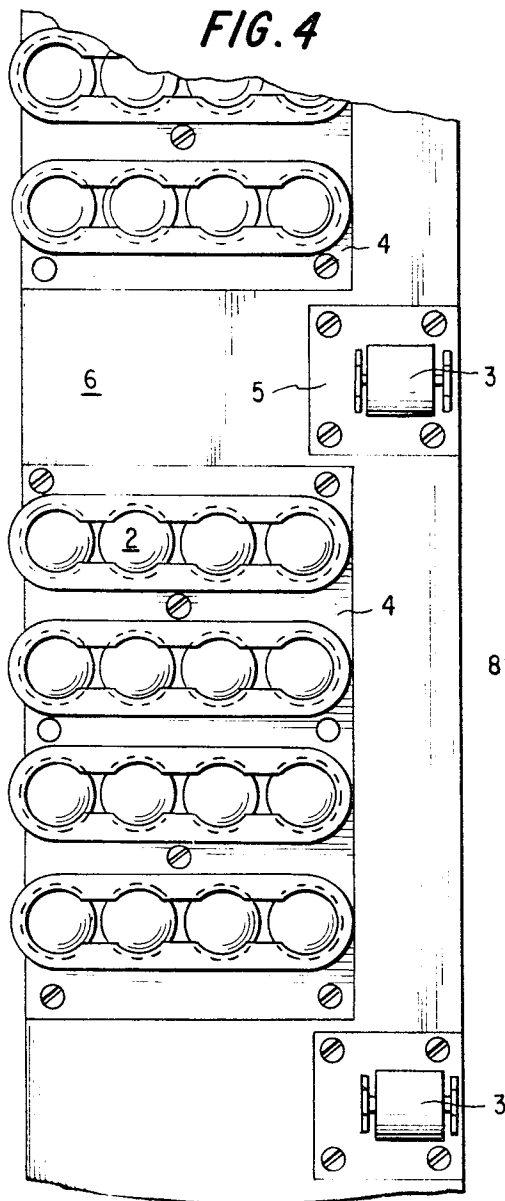


FIG. 6

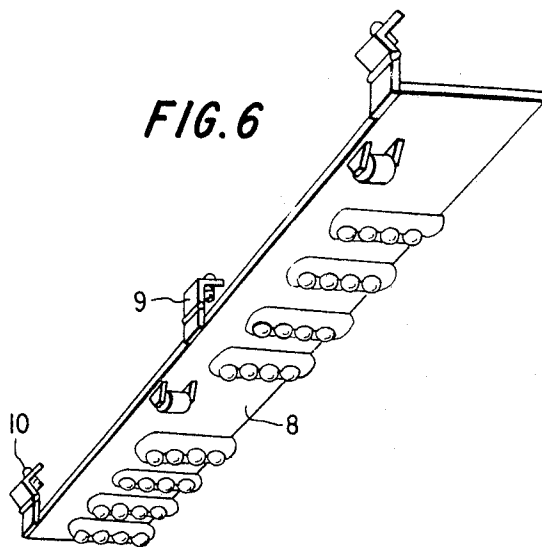
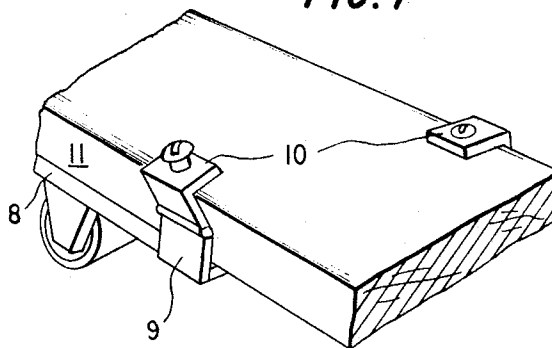


FIG. 7



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## METHOD FOR MODIFYING CONVENTIONAL SNOW SKIS TO PERMIT DOWNHILL SKIING ON SMOOTH GRASSY SLOPES DURING NON-WINTER PERIODS

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3 Claims

### ABSTRACT OF THE DISCLOSURE

A modification of conventional downhill snow skis in such a manner as to permit the wearer to engage in the sport of skiing during non-winter periods, on grassy slopes. The modification comprises an array of lightweight ball type rollers, roller-bearings and skate wheels affixed to the running surface of the skis, said roller-bearings facilitating multi-directional skidding or side-slipping, and said skate wheels permitting controlled movement in a desired direction.

### BRIEF SUMMARY OF INVENTION

The central idea is the modification of conventionally configured snow skis by affixing an array of small commercially produced roller-bearings and skate wheels to the running surface of the skis in such a manner as to meet the object of providing a practical means for skiing during non-winter periods on reasonably smooth grassy slopes. The object of this invention encompasses two possible commercial applications:

(1) The manufacture of special summer skis fitted at the factory with the required roller-bearings and skate wheels, and

(2) The production of a kit containing roller-bearing and skate wheel plates to be mounted by the individual on his own winter skis, and then be removed at will.

### DESCRIPTION OF DRAWINGS

The object of the roller-ski will be apparent with reference to the appended drawings and the following description wherein:

FIG. 1 shows the general configuration of a conventional snow ski with the roller-bearings and skate wheels mounted;

FIG. 2 is an enlarged side view of a section of the roller-ski showing a profile of the roller-bearings and skate wheels;

FIG. 3 is an enlarged rear view cross-section of the left roller-ski showing the height differential between roller-bearings and skate wheels;

FIG. 4 affords a bottom view of a section of the roller-ski showing the detailed array of roller-bearing and skate wheel plates;

FIG. 5 is a rear view cross-section of both skis illustrating how weight on the skate wheels controls direction; and

FIG. 6 shows an optional method of mounting removable plates of roller-bearings and skate wheels.

FIG. 7 is a perspective view of the plate of FIG. 6 attached to a ski.

### DETAILED DESCRIPTION

Downhill skiing entails two general types of movements: (a) a skidding or slide-slipping movement in which the direction of movement is other than the direction of the skis, and (b) a precisely controlled movement in a desired direction achieved by exerting the preponderance of body weight on the inner edge of the

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lower or downhill ski. In the roller-ski, an array of roller-bearings permits the necessary side-slipping movements, and a series of fixed skate wheels provides the means for controlling movement in a particular direction. FIG. 1 shows the general silhouette of the conventional ski when equipped with such roller-bearings 2 and skate wheels 3. FIG. 2 is an enlargement of a portion of FIG. 1 and shows an exploded profile of the roller-bearing plate 4 and skate wheel plate 5 when affixed to the running surface of the ski. FIG. 3 is a rear view cross-section of the left ski illustrating the relative position and height of the roller-bearings 2 and skate wheels 3.

### Roller-bearings

Roller-bearing plates 4 consist of a series of lightweight hard plastic or Cyclocac balls 2 approximately  $\frac{7}{16}$  inch wide, Teflon-coated to insure minimum friction and fully encased to insure that dirt does not inhibit free rolling. (Well lubricated lightweight steel bearings are a feasible alternative, although the increased weight is a disadvantage to the skier.) Roller-bearing plates 4 are screwed into the bottom surface of the ski 6, and cover the outside two-thirds width of the ski and almost its entire length (FIG. 4). The specific number of roller-bearing plates required is variable, depending upon the length of the skis. However, by mounting the maximum number of roller-bearings to reduce the ground pressure of any single bearing, the weight of the skier will be sufficiently distributed to permit free multi-directional movement or side-slipping over most surfaces other than spongy ground, high grass, or rocky terrain.

### Skate wheels

Small steel or Cyclocac skate wheels 3 are mounted on wheel plates 5, and affixed along the inside edge of each ski so that the wheel rolls in the longitudinal direction of the ski (FIG. 4). These skate wheels are  $\frac{1}{2}$  inch in diameter and have approximately  $\frac{5}{8}$  inch of running surface or width. The skate wheels do not pivot or spring, but instead are rigidly mounted to run in a forward direction. Each wheel is mounted so that its running surface is approximately  $\frac{3}{16}$  of an inch above the running surface of the adjacent roller-bearings (FIG. 3). This height differential insures that the skate wheels along the inside edge of the ski do not drag when the skier, with his weight on the center of the skis, is using the roller-bearings for skidding or side-slipping. It is important to note that when the skier desires to slow his downhill movement and change direction by traversing laterally across the face of a slope, as shown in FIG. 5, he can do so by shifting his weight to the inner edge of the downhill ski 7, thus engaging the rigid skate wheels 3 which bite into the turf and prevent downhill side-slipping.

### Mounting

In the prefabricated roller-ski, the roller-bearing plates 4 and the skate wheel plates 5 are inset and screwed into the bottom surface 6 of the skis to provide a flush smooth surface, as illustrated in FIG. 4. The skate wheel plate must include an unusually strong wheel fork and axle since the skate wheel is subjected to considerable weight and stress during any change in the skier's direction.

In the manually prepared or "kit" version of the roller-ski shown in FIG. 6, double-length roller-bearing and skate wheel plates 8 include a series of hinged clamps 9 and set screws 10, to permit the individual to secure the plates to his conventional snow skis 11.

It should be noted that in both versions of the roller-ski, the required roller-bearings and skate wheels, as well as the plates and mounting devices, can be fabricated from commercial materials now in existence.

## Preparation of skiing slope

The roller-ski is not claimed as a substitute for the rapid and smooth type of downhill skiing experienced in snow, nor as a practical device for negotiating slopes which are completely unprepared. For optimum results with the roller-ski, slopes would have to be cleared of such obstacles to smooth running as surface tree roots, heavy deposits of rocks, and thick weed growth. With reasonable preparation of this type, it is visualized that the roller-ski would afford both the ski resorts and the skier the advantage of several additional months of skiing each year, or perhaps year-round skiing in those areas where the ground remains firm.

It will be apparent to those skilled in the art that the roller-ski herein disclosed may be subject to mechanical modifications and substitutions without departing from the scope of the invention. The concept of this invention is intended to include all obvious modifications and substitutions.

## I claim:

1. A roller ski for use on reasonably smooth slopes in the absence of snow comprising:

- (a) a ski member having an upper surface with bindings for attachment to a wearer's foot, a lower sliding or running surface, and an inner and outer edge;
- (b) a plurality of ball-type rollers rotatably affixed to the outer portion of the lower surface of the said ski member;
- (c) a plurality of skate wheels affixed to the lower surface of the said ski member, adjacent the inner edge thereof; said wheels disposed in longitudinal alignment, the axis of rotation of said wheels being

perpendicular to longitudinal axis of said ski member.

2. The roller ski of claim 1 further comprising at least one roller mounting plate, the lower surfaces of said plate rotatably mounting a plurality of said ball-type rollers in mutually spaced parallel rows; the upper surface of said plate affixed to the lower surface of said ski member; said plate extending laterally along the lower surface of said ski member from the outer edge toward the inner edge thereof approximately two-thirds of the width of said ski member.

3. The roller ski of claim 2 further comprising a plurality of said roller mounting plates affixed to the lower surface of said ski member, said plates being affixed in mutually spaced relationship extending longitudinally from the head of said ski member to the toe thereof.

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