

[54] WHEELED SKIS

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87.04 A**

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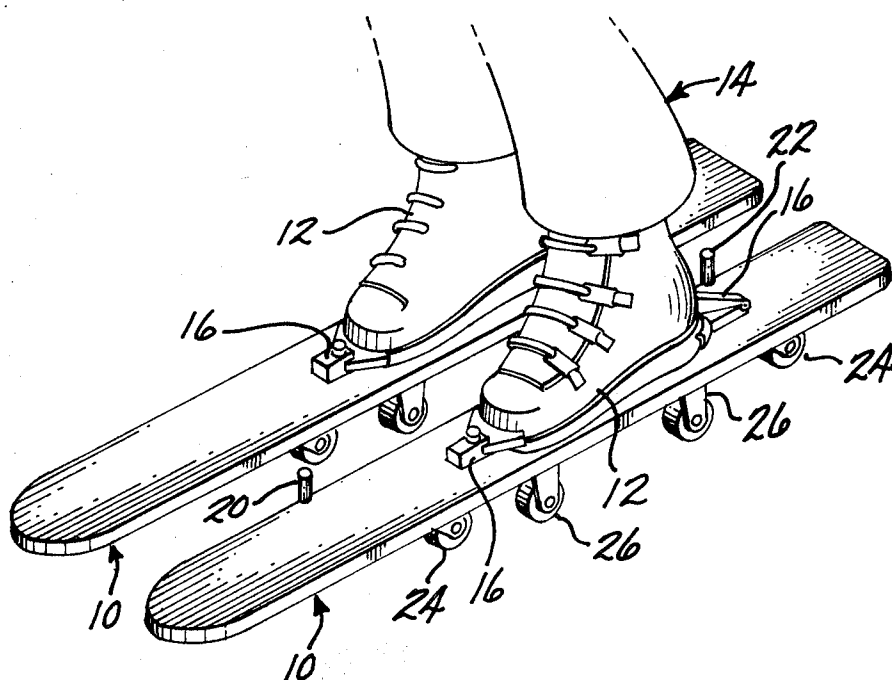
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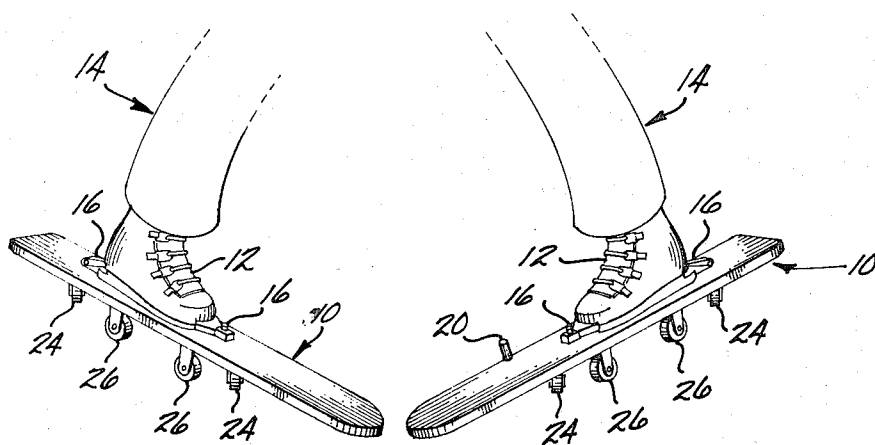
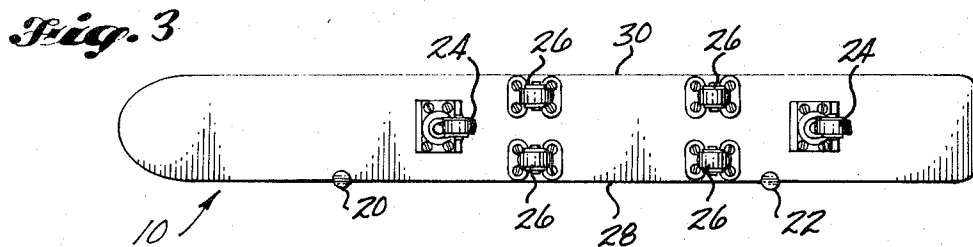
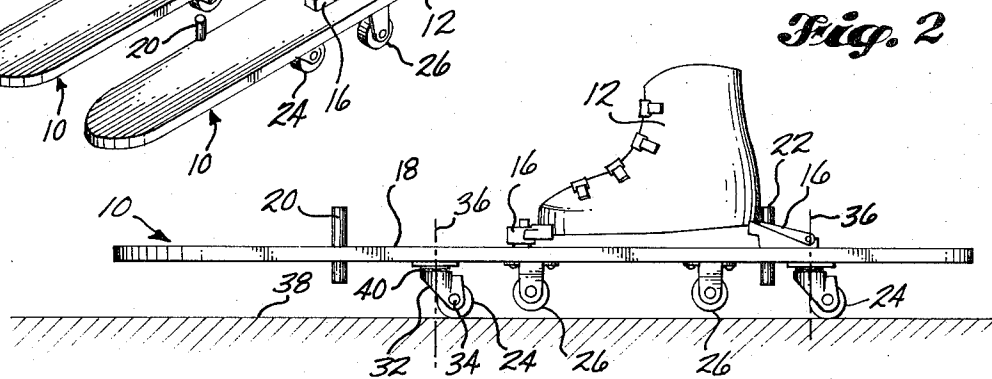
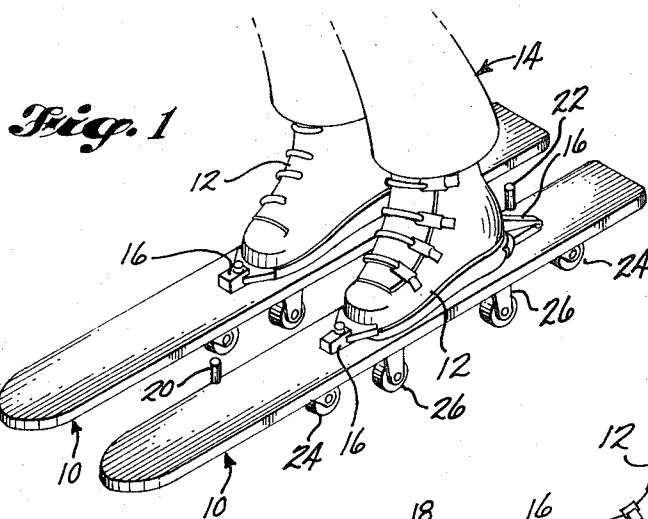
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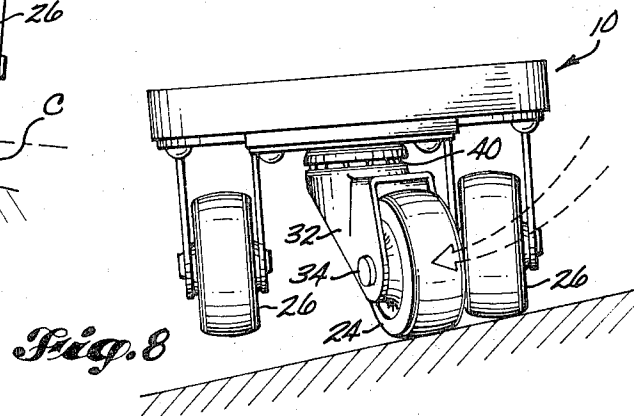
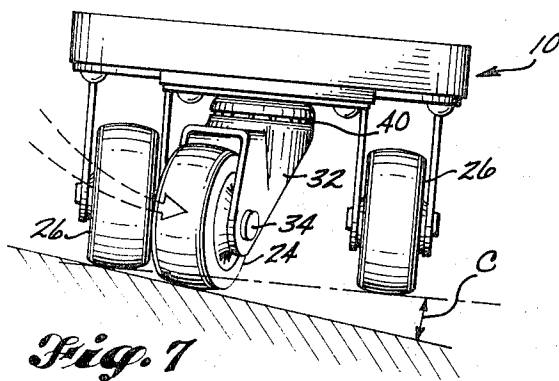
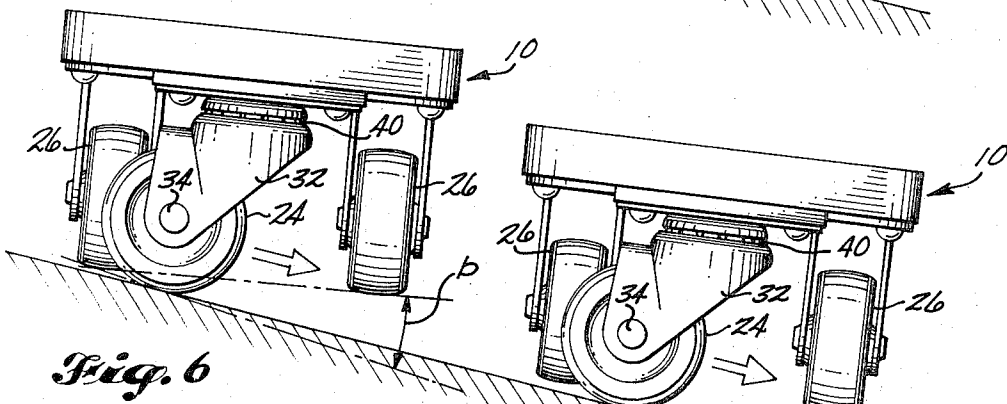
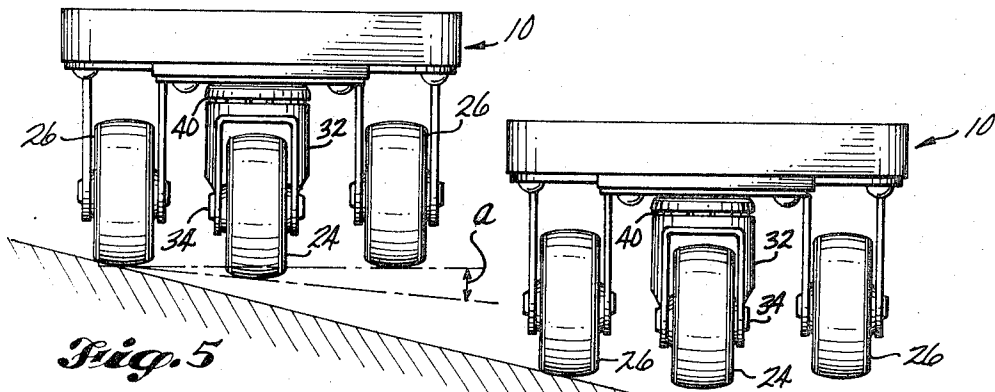
ABSTRACT

A wheeled ski adapted for travel on a ground surface, such as a paved roadway, in a manner to closely simulate actual maneuvers and conditions of conventional snow skiing. There are two ski members, each having a forward and rear turning and sliding wheel located on the longitudinal center axis of the ski, and two sets of tracking wheels located on opposite sides of the ski member intermediate the forward and rear turning and sliding wheels. The tracking wheels each rotate about a horizontal transverse axis substantially fixed with respect to the longitudinal center line of the ski, while each of the turning and sliding wheels has a caster type mounting, in that the horizontal rotating axis of the wheel is spaced horizontally from a vertical axis about which a mounting for the wheel rotates. This particular combination of wheel elements on the ski members provides close simulation for the user of maneuvers performed in conventional snow skiing.

6 Claims, 8 Drawing Figures







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WHEELED SKIS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to wheeled skis adapted to simulate conventional snow skiing.

2. Brief Description of the Prior Art

Various wheeled devices to be attached to a person's feet are shown in the prior art. For example, three early U.S. patents (Gregg, U.S. Pat. No. 153,945; Curtis, U.S. Pat. No. 116,690; and Clark, U.S. Pat. No. 301,676) illustrate the use of auxiliary turning wheels on a roller skate. Two other patents (Benner et al., U.S. Pat. No. 2,253,012 and Thompson, U.S. Pat. No. 2,403,885) illustrate the use of wheels mounted to a ski like member, the wheels being rotated about respective transverse horizontal axes. Two French patents (Pat. No. 769,983 and Pat. No. 834,345) illustrate other arrangements of wheeled members attached to a ski, the latter patent having a forward wheel providing some turning capability.

Several later patents have provided wheeled ski members for the purpose of giving some degree of simulation of snow skiing. For example, Mangus, U.S. Pat. No. 3,512,796, utilizes roller members which extend across the width of the ski, with the roller members being tapered from the center portion thereof toward both side portions, so that the user can accomplish some sideslipping by tilting the ski over onto the tapered surfaces on one side of the ski. Simms, U.S. Pat. No. 3,545,779, discloses a wheeled ski having a forward and rear set of wheeled trucks, each mounted for rotation about a respective vertical axis. The mounting is so arranged that when the skier tilts his weight either to the right or to the left, the wheel trucks are caused to rotate oppositely so as to turn the ski in the direction toward which the weight of the skier is applied.

Tyson, U.S. Pat. No. 3,522,951 illustrates a roller ski having a plurality of ball-type rollers along substantially the entire bottom surface of the ski. Along the inside edge of each ski, there are a plurality of rigid skate wheels each mounted for rotation about a fixed transverse horizontal axis. With the skis flat on the ground, the ball-type rollers permit the ski to roll downhill regardless of the direction in which the ski is pointing. By tilting one or the other of the skis toward the inside, the user can cause engagement of the fixed skate type rollers to cause the ski to travel in a direction generally parallel to the lengthwise axis of the ski. Thus the skis of Tyson do provide a certain degree of maneuverability.

SUMMARY OF THE PRESENT INVENTION

In contrast to the prior art, the present invention provides wheeled ski members arranged to simulate quite closely the actual maneuvers performed and the conditions encountered in conventional snow skiing. While the individual elements which go into making snow skiing maneuvers (e.g. position of the skis, lateral tilting of the skis, application and distribution of the weight of the skier on the skis, angular momentum of the skier, etc.) are generally known, the manner in which these various elements are combined in the body movements of an expert skier to accomplish particular skiing maneuvers are in some instances somewhat sophisticated and subtle. However, for an adequate understanding of

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the present invention, it is believed that some discussion of the dynamics of some of the more elementary maneuvers in snow skiing is appropriate.

First, in traveling down a ski slope in a generally straight downhill direction (i.e., down the "fall line" of the slope), the skis have a natural tendency to "track" along the direction of travel, in part due to the longitudinal center groove along the bottom of each ski and also because of the side edges of the ski being depressed into the snow to some extent. In a second situation when a skier is traversing a slope (i.e., traveling in a more or less straight line downwardly and laterally at an angle to the fall line), the weight of the skier creates a downhill force component which tends to make the skier sideslip. This sideslip can be resisted by the skier by riding on the uphill edge of either or both of the skis so that the edge or edges bite into the snow to cause the skier to follow a path more or less paralleling the direction in which the skis are pointed. In the "wide track" method of skiing now espoused by many modern day experts, the skis are spaced more widely apart, with the weight of the skier being placed more or less equally on both skis, and with the uphill edges of both skis biting into the snow.

With respect to turning maneuvers, one relatively simple turning maneuver can be described in terms of the "piano stool" effect, where the skier swings his upper body in one direction thus causing an opposite reaction of the skis rotating in the opposite direction. This type of turning is generally accomplished with the bottom surfaces of the skis generally flat against the snow so that the edges of the skis do not resist the rotating movement of the skis to any great extent, and then selectively engaging the edges of the skis between such rotational movements of the skis to execute a series of traverses. Thus by a series of "piano stool" body movements in alternate directions the skier can execute a series of alternate right and left turns. This can be described as a series of "shortswing" parallel turns with limited traverse of the slope between turns.

In negotiating a series of downhill turns where there is substantial traverse back and forth across the slope, it is necessary not only to turn the skis, but force must be applied from the skier through the skis against the snow to effect a change of momentum of the skier. In effecting such a turn, the skier in addition to using the "piano stool" effect to cause turning of the skis, will also selectively engage the side edges of the skis to bite into the snow and quite often will lean either forwardly or rearwardly to shift his center of gravity forward or rearwardly, respectively, with respect to the skis to obtain a desired force couple to enhance the turning movement.

To explain this more fully, let it be assumed that the skier is traversing the slope downwardly to the left, and is about to attempt a right turn to cause him to begin moving in a downhill traverse to the right. Initially, the skier has the uphill (i.e., left) edges of his skis biting into the ski slope so as to resist turning and sideslipping. In preparation for the turn, the skier rotates his body to the right so as to be facing somewhat downhill. Then the skier swings at least a portion of his body (usually his legs and hips) counterclockwise, as he tilts his skis laterally toward flat engagement with the snow to permit the skis to rotate clockwise (i.e., to the right) in a turning sliding motion. As the skier continues the turning and sliding toward completion of his turn, he then

tilts his skis in a controlled manner to engage the snow surface with the uphill edges of his skis to flow smoothly from a turning mode into a downhill traverse to the right.

When a skilled skier executes such a turn, there appears to be, after the initiation of the turn by the skier swinging his body, a continued turning and sliding motion without any discernable body movement of the skier. This is believed to be due in part to the manner in which the skier positions his body weight with respect to the skis. By the skier leaning rearwardly as he slides into the turn, the center of gravity of the skier is moved rearwardly with respect to the length of the skis so that the inertial force of the skier's body is applied to the skis at a position somewhat rearwardly of the center of the skis. However, the resistance of the snow against the side edges of the skis moving into the snow, tends to apply a resultant force closer to the center of the skis. This causes a force couple tending to continue the rotation of the skis in the direction of the turn. This effect occurs primarily when skiing in deeper snow, where the resistance of the snow against any sideslipping of the ski is of greater effect. Somewhat different dynamics are involved in skiing on a harder snow surface.

Undoubtedly, the above explanation is to some degree an over simplification of all the dynamics which occur in a turning maneuver of this type. For example, the effect of the camber of the skis and the curved tips of the skis engaging the snow when the skis are tilted has not been considered. However, for purposes of understanding the more important aspects of simulating actual skiing maneuvers by the apparatus of the present invention, it is believed that the above discussion does provide some basis of understanding.

In the present invention, there are two ski members, each of which has a set of turning and sliding wheels and also a set of tracking wheels. The turning and sliding wheels comprise at least one forward wheel and one rearward wheel, each of which has a caster type mounting, in that each wheel is rotatably mounted about a horizontal axis to a mounting which in turn is mounted to the ski for rotation about a vertical axis spaced from the horizontal axis of its related wheel. The tracking wheels are located at the edge portion of the skis and rotate about respective transverse horizontal axes substantially fixed with respect to the longitudinal center axis of the ski.

In the preferred form, the tracking wheels are located on both sides of the ski, proximate the lateral edge portions thereof and intermediate the front and rear turning and sliding wheels. The turning and sliding wheels extend moderately below the tracking wheels. On one of the skis, there is a forward and a rear post, each extending moderately above and below the plane of the ski to prevent inadvertent crossing of the skis.

In using the present invention, the skier fixedly attaches his boots to the two ski members in substantially the same manner as a conventional ski boot is attached to a snow ski. The skier then proceeds to ski down a ground surface, such as a paved roadway, and manipulates his skis in coordination with his body movements in substantially the same manner as he would conventional snow skis to accomplish maneuvers corresponding quite closely to snow skiing maneuvers.

For traveling in a straight line downhill (i.e., along the fall line of the hill), the skis are simply pointed

downhill and held in a plane generally parallel to the ground surface. With the skis in this position, the two turning and sliding wheels engage the ground surface, with the tracking wheels being positioned slightly above the ground surface. Since the caster type mounting of the turning and sliding wheels, when carrying weight, provides some frictional resistance to the swiveling of these wheels, the turning and sliding wheels tend to follow a straight line paralleling the longitudinal axis of the skis, thus simulating the tendency of conventional snow skis to track as they travel in a downhill direction.

When the skier is traversing a slope in a downhill direction, he simply tilts both skis so that the uphill set of tracking wheels on each ski engages the ground surface, with the tracking wheels thus causing the skis to travel in a downhill traverse paralleling the direction in which the skis are pointed. Since the tracking wheels are provided on both sides of the ski, the weight can be distributed on both skis, with both skis resisting downhill slippage, as in the case of a skier using a wide track stance in traversing a slope. When the skier wishes to sideslip to some extent, he tilts his skis moderately downhill to cause partial engagement of the turning and sliding wheels. As the weight of the skier is taken from the tracking wheels, the skier begins a sideslip down the hill until he again engages the tracking wheels on the upper edges of the skis. Subtle lateral control by side tilting of the skis is an important element in traversing, sideslipping and turning maneuvers; the placement of the turning and sliding wheels at the longitudinal center line permits such lateral tilting in a controlled manner.

In executing a series of shortswing turns without any substantial transverse, the skier maintains his skis in a plane generally parallel with the ground and executes a series of "piano stool" swings of his body. The skis then counter rotate with respect to the skier's body rotation, as the skier continues in a series of sideslipping rotational turns down the hill, with selective engagement of the side tracking wheels between such "piano stool" swings.

To execute a turn from a traverse in one direction to a traverse in the other direction, the skier executes the normal body movements which he would perform in conventional snow skiing. That is to say, with his skis riding on the uphill edges in the traverse (so that the uphill tracking wheels are engaged), as a preliminary maneuver the skier turns his body facing somewhat downhill. He then swings at least a portion of his body (legs and hips) toward the uphill as he releases the tracking wheels from engagement by bringing the plane of the skis generally parallel to the ground surface. As the skier continues into the turn with a turning and sliding motion with the weight being primarily on the turning and sliding wheels, the skier begins gradual engagement of the opposite sets of tracking wheels which are then becoming the uphill edges of the ski. At completion of the turn, the skier then has his skis tilted with respect to the ground surface so that the primary engagement with the ground is through the then uphill sets of tracking wheels.

It is significant to note in the present invention the manner in which the opposite sets of tracking wheels come into engagement with the ground surface during the turning and sliding motion of the skis. First it should be noted that because of the particular caster type

mounting of the turning and sliding wheels, each of these wheels moves laterally away from the direction in which it is swiveling. Thus in the case of a turn from left to right, the forward turning and sliding wheel of the ski is directed more toward the right and hence moves laterally away from the right edge of the ski. On the other hand, with the rear portion of the ski swinging toward the left, the rear turning and sliding wheel is directed more toward the left and hence moves laterally closer to the right edge of the ski. The effect is that as the ski is tilted to the right, the forward tracking wheel comes into engagement with the ground before the rear tracking wheel. As the skier tilts his weight rearwardly and continues pressing on the right portion of the ski, the skier's weight is resting primarily on the rear turning and sliding wheel and the forward right tracking wheel. This creates a force couple between the forward right tracking wheel and the point at which the skier's center of gravity is effectively imposed on the ski, this force couple causing further turning and sliding motion of the ski similar to that which occurs in actual snow skiing. As the skier then tilts his ski further so that both the right tracking wheels come into engagement, the turning and sliding motion is arrested and the skier proceeds in a downhill traverse in a direction paralleling the longitudinal axis of the skis.

Other aspects of the present invention will become apparent from the following detailed description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view of the skis of the present invention being worn by a skier;

FIG. 2 is a side elevational view of one of the skis, with a ski boot of the skier being clamped thereto;

FIG. 3 is a bottom plan view of one of the skis of the present invention;

FIG. 4 illustrates the manner in which the skis of the present invention are used in a conventional "snow-plow" stance of a skier;

FIG. 5 is a rear elevational view of the skis in a position where a downhill traverse is being executed;

FIG. 6 is a view similar to FIG. 5 showing the manner in which the skis are positioned to execute a sideslip from a downhill traverse;

FIG. 7 is a view similar to FIGS. 5 and 6, showing one of the skis near the completion of a left hand turn and beginning a left downhill traverse; and

FIG. 8 is a view similar to FIG. 7 but showing the ski completing a right hand turn and beginning a right hand downhill traverse.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to FIG. 1, there are shown right and left skis 10, affixed to, respectively, right and left ski boots 12 of a skier 14 by means of ski bindings 16 (which are or may be conventional ski bindings). Each ski 10 comprises an elongate generally planar ski member 18 to which its respective ski binding 16 is mounted at the desired foot location of the ski member 18. On the left ski, positioned forwardly and rearwardly of the foot location are a first forward post 20 and a second rearward post 22 each of which extends moderately above and below the surface of the ski member 18 to prevent inadvertent crossing of the skis 10.

Mounted to the bottom side of each ski 10 is a first pair of turning and sliding wheels 24 and two pairs of tracking wheels 26. One pair of tracking wheels 26 is mounted adjacent the right edge 28 of the ski member 18, while the other set is mounted similarly adjacent the left edge 30 of the ski member 18. The two forward tracking wheels 26 are located longitudinally at the toe portion of the foot location defined by the binding 16, while the two rear tracking wheels are located adjacent the heel portion of the foot location as defined by the ski binding 16. Each of the tracking wheels 26 is mounted to rotate about a respective horizontal transverse axis substantially fixed with respect to the longitudinal axis of the ski 10.

The two turning and sliding wheels 24 of each ski 10 are positioned along the longitudinal center axis of their related ski member 18, with the forward wheel 24 being mounted a moderate distance forward of the forward tracking wheels 26, while the rear wheel 24 is a moderate distance rearwardly of the rear tracking wheels 26. Each turning and sliding wheel 24 is mounted to a caster type mounting 32 for rotation about a horizontal axis 34. Each caster mounting 32 is in turn mounted for rotation about a respective vertical axis 36 spaced moderately horizontally from the horizontal axis of rotation of its related wheel 24. The tracking wheels 26 are located in a plane parallel to the plane of their related ski member 18 and moderately above the plane occupied by the turning and sliding wheels 24, so that with the ski member 18 positioned horizontally with respect to a ground surface 38, the ski 10 rests on its two turning and sliding wheels 24.

Before discussing in detail the operation of the skis 10 of the present invention, it is significant to note two characteristics of the turning and sliding wheels 24. First, with the offset of the horizontal axis of rotation 34 of each of the wheels 24 with respect to the vertical axis of rotation 36 of its related caster mounting 32, when a force is applied to the wheel 24, so as to exert a torque on the journal mounting 40 of the caster mounting 32, there is a tendency for the journal mounting 40 to provide moderate resistance to the rotation of the caster mounting 32 about the axis 36.

Secondly, when one of the wheels 24 rotates or swivels about the vertical axis 36 of its mounting 32, the wheel 24 also moves laterally toward either the right or left set of tracking wheels 26. The effect of this is an increase in the angle defined by the plane defined by the lower extremity of the wheel 24 and the lower extremity of the two tracking wheels 26 toward which it moves, and the horizontal plane defined by the lower extremity of the four tracking wheels 26. This is illustrated in FIGS. 5, 6 and 7, wherein are shown three positions of the rear turning and sliding wheel 24. As can be seen in FIG. 5, with the wheel 24 aligned in a forward direction, the angle "a" defined by the two planes is approximately 5°. As shown in FIG. 6, with the wheel 24 directed laterally (i.e., at a right angle with respect to the longitudinal axis of the ski 10), the angle "b" defined by the two planes is increased to about 13°. As shown in FIG. 7, with the wheel 24 turned moderately at about 30° from a straight ahead direction, the angle "c" is about 8°.

In using the skis 10 of the present invention, the skier 14 secures his boots 12 to the skis 10 by means of the binding 16 and begins downhill travel in much the same manner as he would in conventional snow skis. If the

skier points his skis downhill generally parallel with the fall line of the ground surface, with his skis generally parallel to the ground surface, the weight of the skier rests on the two wheels 24 so that there is moderate resistance to any swiveling of the wheels 24, which in turn causes the skis to track properly along the downhill path of travel. The posts 20 and 22 tend to prevent any inadvertent crossing of the skis 10, which could result from striking unexpectedly a rock or other protrusion on the ground surface. If one of the wheels 24 strikes a small obstacle (e.g. a rock) on the ground surface, the lateral swiveling action of the wheel 24 permits it to move around the obstacle and immediately back on the line of travel.

If in the skier's downhill travel he wishes to slow down by using a "snowplow" maneuver, he merely moves his skis outwardly and toes them inwardly as shown in FIG. 4, while tilting the skis toward their inside edges. This causes engagement of the inside set of tracking wheels 26 on each ski 10, with the sideslipping of the tracking wheels 26 slowing the downhill progress of the skier.

If the skier is attempting a downhill traverse (i.e., traveling at an angle to the fall line of the hill), the skier simply holds his skis 10 so that the uphill tracking wheels 26 engage the ground surface. The position of the skis during this maneuver is illustrated in FIG. 5. To effect a sideslipping action of the skis, the skier tilts the plane of the skis in the downhill direction to bring the turning and sliding wheels 24 into ground engagement. As the weight of the skier shifts onto the wheels 24, the skier begins a downhill sideslip, as shown in FIG. 6.

To make a parallel turn from a traverse, the skier makes substantially the same body movements which he would make in conventional snow skiing. The skier begins the turn from the position shown in FIG. 5, where the skis are shown traveling downhill to the left in a traverse, with the skis riding on the uphill tracking wheels 26. In preparation for the turn, the skier first twists his body to the right so that the skier is facing somewhat downhill, with no turning of the skis taking place because of the engagement of the uphill tracking wheels 26. Next the skier rotates his body counterclockwise, while tilting his skis in a downhill direction to bring the turning and sliding wheels 24 into primary engagement with the ground surface, thus substantially disengaging the tracking wheels 26. This causes a counter rotational movement of the skis 10, with the forward turning and sliding wheel 24 of each ski pointing downhill to the right, while the rear turning and sliding wheel 24 of each ski is directed more toward the left with respect to the longitudinal axes of the skis.

As the skier slides further into the turn, he begins to bring the opposite sets of tracking wheels (i.e., the right sets of tracking wheels 26 as seen in FIG. 5) into engagement. Since the forward turning and sliding wheel 24 has swing toward the left by virtue of the turning motion of the skis, the forward right tracking wheel 26 of each ski comes into engagement with the ground surface prior to each of the rear right tracking wheels 26 making ground contact. Further, with the skier leaning somewhat rearwardly on his skis as he moves through the turn so as to shift his center of gravity rearwardly with respect to the skis, a force couple is created about the two forward right tracking wheels 26 and the center of gravity of the skier. This causes the skis to continue

a turning sliding motion generally about the right front tracking wheels 26.

As the skier continues to move to the completion of his turn, he continues to press down the right edge portions of his skis (which are now the uphill edges of his skis) to bring both uphill tracking wheels 26 of each ski into ground engagement, as illustrated in FIG. 8. This adds an increased component of travel in the direction of the longitudinal center line of the skis, which in turn causes the rear wheel 24 to swing more toward the center line of the ski, so that there is more positive engagement of the tracking wheels 26 with the ground surface with no additional tilting of the skis 10. With the turn completed, the skier then continues on a downhill traverse to the right, riding on the uphill tracking wheels 26. Thus the turn is accomplished in substantially the same manner as a parallel turn is conventional snow skiing.

While not disclosed in any detail herein, it is to be understood that other ski maneuvers can also be accomplished with the skis of the present invention in a manner closely simulating conventional snow skiing. For example, an uphill christie can be executed from a traverse in much the same manner as it is done in conventional snow skiing. Also, a stem turn can be executed with generally the same movement that would be employed in conventional snow skiing. Also, as illustrated in FIGS. 7 and 8, with tracking wheels 26 on both sides of the ski 10, right and left hand maneuvers can both be performed in much the same manner.

What is claimed is:

1. A wheeled ski adapted for travel on a ground surface, such as a paved roadway, in a manner to closely simulate actual maneuvers and conditions of conventional snow skiing, said ski comprising:

- a. a ski member having a longitudinal center axis, a horizontal transverse axis, a front portion, a rear portion, and two side portions, said ski member being adapted to engage a foot of a skier at a foot location of said ski member intermediate the front and rear portions thereof,
- b. a first set of longitudinally aligned tracking wheels located along at least one side portion of said ski member and mounted thereto for rotation about respective transverse horizontal axes substantially fixed angularly with respect to the longitudinal axis of said ski member, said tracking wheels extending below said ski member so as to be able to engage said ground surface,
- c. a second set of tracking wheels located along the other side portion of said ski member and mounted thereto for rotation about respective transverse horizontal axes substantially fixed angularly with respect to the longitudinal axis of said ski member, said second set of tracking wheels extending below said ski member so as to be able to engage said ground surface,
- d. a set of third turning and sliding wheels, each of said third wheels being mounted to a respective wheel mounting means for rotation about a respective horizontal axis, with each of said wheel mounting means being in turn mounted to said ski member for rotation about a respective generally vertical axis spaced horizontally from the horizontal axis about which its respective turning and sliding wheel rotates, and

d. said turning and sliding wheels extending moderately below and positioned transversely between said first and second tracking wheels, whereby when one of said third wheels swivels about the vertical axis of its related mounting in a turning and/or sliding mode, it also moves laterally to increase an angle defined by two planes, one of which planes is defined by lower portions of the first and second tracking wheels, and the other of which planes is defined by said one of the third wheels and the set of tracking wheels toward which the one of said third wheels is rotated, thus permitting controlled differential engagement of the tracking wheels in conjunction with the turning and sliding wheels to facilitate maneuvers closely simulating corresponding maneuvers performed in snow skiing.

2. The ski as recited in claim 1, wherein said set of third turning and sliding wheels comprises a front turning and sliding wheel positioned along the longitudinal center line of the ski member forwardly of said first and second sets of tracking wheels, and a rear turning and sliding wheel positioned along said longitudinal center line of the ski member rearwardly of said first and second sets of tracking wheels, whereby in a turning mode with one of said turning and sliding wheels positioned laterally closer to one set of said tracking wheels, it is possible to cause ground engagement of one tracking wheel and one turning and sliding wheel to provide a turning force couple on said ski.

3. The ski as recited in claim 2, wherein each set of tracking wheels comprises a forward tracking wheel located at a position proximate a toe portion of said foot location, and a rear tracking wheel located proximate a heel portion of said foot location.

4. A wheeled ski adapted for travel on a ground surface, such as a paved roadway, in a manner to closely simulate actual maneuvers and conditions of conventional snow skiing, said ski comprising:

- a. a ski member having a longitudinal center axis, a horizontal transverse axis, a front portion, a rear portion, and two side portions, said ski member being adapted to engage a foot of a skier at a foot location of said ski member intermediate the front

and rear portions thereof,

- b. a first set of longitudinally aligned tracking wheels located along at least one side portion of said ski member and mounted thereto for rotation about respective transverse horizontal axes substantially fixed angularly with respect to the longitudinal axis of said ski member, said tracking wheels extending below said ski member so as to be able to engage said ground surface,

- c. a set of second turning and sliding wheels, each of said second wheels being mounted to a respective wheel mounting means for rotation about a respective horizontal axis, with each of said wheel mounting means being in turn mounted to said ski member for rotation about a respective generally vertical axis spaced horizontally from the horizontal axis about which its respective turning and sliding wheel rotates, and

- d. said turning and sliding wheels extending moderately below and positioned laterally of said tracking wheels, thus permitting controlled differential engagement of the tracking wheels in conjunction with the turning and sliding wheels to facilitate maneuvers closely simulating corresponding maneuvers performed in snow skiing.

5. The ski as recited in claim 4, wherein said set of turning and sliding wheels comprises a front turning and sliding wheel positioned along the longitudinal center line of the ski member forwardly of said first set of tracking wheels, and a rear turning and sliding wheel positioned along said longitudinal center line of the ski member rearwardly of said first set of tracking wheels, whereby in a turning mode with one of said turning and sliding wheels positioned laterally closer to said set of said tracking wheels, it is possible to cause ground engagement of one tracking wheel and one turning and sliding wheel to provide a turning force couple on said ski.

6. The ski as recited in claim 5, wherein said set of tracking wheels comprises a forward tracking wheel located at a position proximate a toe portion of said foot location, and a rear tracking wheel located proximate a heel portion of said foot location.

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