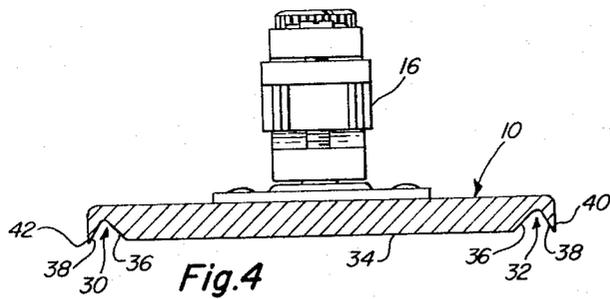
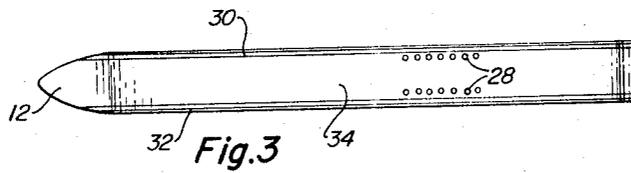
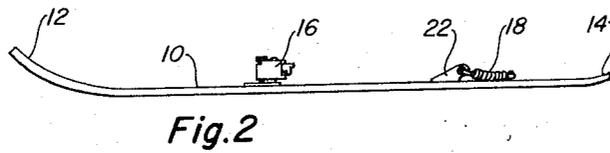
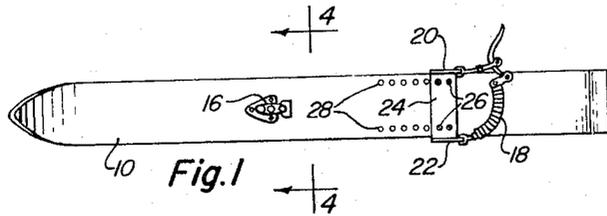


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METAL SKI HAVING A PAIR OF GROOVES AT
THE OPPOSITE EDGES THEREOF
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METAL SKI HAVING A PAIR OF GROOVES AT THE OPPOSITE EDGES THEREOF

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The subject matter of the present invention relates generally to skis for travelling over snow, and in particular to a metal ski of one-piece construction having a pair of grooves provided in its bottom surface adjacent the outer edges at the opposite sides of the ski, and to a method of manufacturing such ski.

The ski of the present invention is especially useful when made in the form of a "shortie" type ski having a length on the order of three to four feet, but may also be made of a longer more conventional length if the proper metal is employed.

Briefly, one embodiment of the ski of the present invention is made entirely of extruded aluminum having an anodized surface to prevent snow from sticking to the ski and provide a permanent base coating of aluminum oxide on the bottom surface of the ski which has a low coefficient of friction in all types of snow. A pair of spaced, longitudinal grooves of substantially triangular cross section are provided in the bottom surface of the ski adjacent the outer edges at the opposite sides thereof, in place of the conventional single, centrally located groove, to provide more maneuverability, better "tracking" and faster stopping characteristics.

The ski of the present invention has several advantages over previously made skis, including an inexpensive, one-piece construction. Since the present ski is made entirely of metal, it is strong and requires substantially no maintenance. In addition, the anodized surface provides a permanent base coating having a low coefficient of friction for all types of snow which is virtually indestructible. Furthermore, the present skis are lightweight and more maneuverable than conventional skis so that children and inexperienced adults can learn to ski much faster than when attempting to do so on conventional skis. The grooves adjacent the outer edges of the ski also cause such edges to be more effective in preventing the ski from "wandering" off of the selected path and enable faster stopping.

It is, therefore, one object of the present invention to provide a metal ski of an inexpensive, one-piece construction.

Another object of the invention is to provide a ski made entirely of metal which is strong, lightweight and requires substantially no maintenance.

A further object of the invention is to provide a metal ski having an anodized surface to prevent snow from sticking to the upper surface and to provide a permanent base coating on the lower surface of such ski which has a low coefficient of friction in all types of snow conditions.

An additional object of the invention is to provide an improved "shortie" type ski which is more maneuverable and has a better "tracking" characteristic in that it does not tend to wander off of the selected path.

Still another object of the invention is to provide an improved ski having a pair of longitudinal grooves adjacent the outer edges at the opposite sides of the bottom surface of such ski to provide more maneuverability, better tracking and faster stopping characteristics.

A still further object of the present invention is to provide an improved method of manufacturing skis which involves the step of extruding metal to form a ski of a one-piece construction.

Other objects and advantages of the present invention

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will be apparent from the following detailed description of a preferred embodiment thereof and from the attached drawings, of which:

FIG. 1 is a plan view showing the top of one embodiment of the ski of the present invention;

FIG. 2 is a side view of the ski of FIG. 1;

FIG. 3 is a bottom view of the ski of FIG. 1; and

FIG. 4 is a vertical section view taken along the line 4—4 of FIG. 1 on an enlarged scale.

As shown in FIG. 1, one embodiment of the ski of the present invention is a "shortie" type ski of less than five feet in length including a body member 10 formed in one piece of aluminum alloy or other suitable metal, such as magnesium or stainless steel. The body member 10 is of a generally rectangular shape having a length of thirty-six inches, a width of three and one-half inches and a thickness of a quarter inch. A pointed top portion 12 is provided at the front end of the body member, which curves upward from the ground engaging portion for a distance of approximately four to five inches, and a rear or tail portion 14 is provided at the rear end thereof, which curves upwardly a distance of approximately one-half inch. In order to hold a ski boot on the upper surface of the body member 10, a conventional toe-piece 16 is attached by screws to such upper surface and a heel release safety binding 18 of conventional construction also attached to such upper surface. The heel binding 18 may be connected by swivels to upwardly extending flange portions 20 and 22 of a supported plate 24 which is also attached to the upper surface of the body member 10 by screws 26. A plurality of threaded holes 28 may be provided through the body member 10 to enable longitudinal adjustment of the support plate 24 to compensate for different size ski boots. These adjustment holes 28 may be filled with threaded nylon or aluminum inserts when not in use in order to provide a smooth bottom surface for the body member. It should be noted that aluminum, rather than steel, screws are employed when the body member 10 is made of aluminum because steel screws cause a chemical reaction with the aluminum of the body member which may produce a permanent bond between such screws and such body member. Of course, a front release safety binding can be employed in place of the heel binding 18 when the ski of the present invention is made in a conventional length, in which case adjustment holes 28 can be eliminated.

As shown in FIGS. 3 and 4, the body member 10 is provided with a pair of longitudinal grooves or channels 30 and 32 in the ground engaging portion of the bottom surface 34 of such body member. These grooves are positioned adjacent the outer edges at the opposite sides of such bottom surface and extend substantially parallel to one another along the entire length of the ski with the exception of the end of the tip portion 12. Each of the grooves 30 and 32 is formed of a generally triangular shape having a first wall portion 36 which extends upward and outwardly at an angle of about 45° with respect to the bottom surface 34, and a second wall portion 38 which extends upward and inwardly at an angle of approximately 60° to such bottom surface. The first and second wall portions intersect at the top of the grooves in an angle of about 75° at a distance of 1/8 inch or approximately one-half of the thickness of the body member. In addition, a small radius of curvature of approximately 1/32 inch may be provided at the intersection of the first and second wall portions of the groove in order to prevent snow from packing in such groove.

The second wall portions 38 of the grooves 30 and 32 extend upwardly from a point immediately adjacent the two outer edges 40 and 42 at the opposite sides of the ski member so that such outer edges are much more

pronounced than on conventional skis. These sharp edges enable faster stopping on snow and ice and cause the skis to better "track" the selected path of a skier and prevent the skis from "wandering" off of such path. However, in order to prevent the outer edges 40 and 42 from becoming a hazard which might injure the skier, they may be provided with a radius of curvature of about $\frac{1}{64}$ inch and this does not diminish their stopping or tracking abilities to any appreciable extent. It should be noted that a conventional center groove is not effective on "shortie" skis to prevent "wandering," due to the short distance between the heel of the ski boot and the rear end of the ski, which is only about eight to ten inches. Thus the bottom surface 34 extends as a substantially flat, continuous surface between the edge grooves 30 and 32 to provide a flat "running" surface. In addition, the pair of grooves 30 and 32 on the present ski also greatly increases the maneuverability of the ski and enables children and inexperienced adults to turn quite easily and thus to learn how to ski more quickly.

The ski of the present invention can be manufactured by extruding aluminum alloy, or other suitable metal, through a die having an aperture in the shape of the ski cross section shown in FIG. 4, to provide a flat sheet of aluminum having grooves 30 and 32 provided therein. Next the tip portion 12 is cut in the pointed shape shown and such tip portion is bent upwardly to form the curved configuration of FIG. 2. Similarly the tail portion 14 may also be bent upwardly into its curved configuration. Thus the ski member is of uniform cross section along the entire length of the ground engaging portion of the bottom surface 34 following the tip portion 12. In order to provide a permanent base coating having a reduced coefficient of friction on the bottom surface 34 of the ski, ski member 10 can be anodized to harden its entire surface and provide a thin coating of aluminum oxide thereon. This coating prevents snow from sticking to the top surface of the ski, as well as providing a slick base coating on the bottom surface 34 including the grooves 30 and 32. In this manner the metal ski of the present invention may be manufactured in one piece by a simple and inexpensive process. Of course, if a heel binding is to be employed the adjustment holes 28 can be drilled and threaded and should be located so that they are between the grooves 30 and 32 rather than within such grooves.

It will be obvious to those having ordinary skill in the art that various changes may be made in the details of the above described preferred embodiment of the present invention. For example, the cross sectional shape of the grooves 30 and 32 may be changed and a different base coating can be employed on the bottom surface 34. Also the side grooves 30 and 32 may be formed by milling rather than by extrusion when stainless steel is employed. Therefore, the scope of the present invention should only be determined by the following claims.

I claim:

1. A snow ski, comprising:
 - an elongated ski member of one piece metal construction having a pair of spaced longitudinal grooves provided in the bottom surface of said ski member extending substantially parallel to one another adjacent the outer edges of said bottom surface at the opposite sides thereof; and
 - said bottom surface providing a substantially flat, continuous ground engaging surface between said grooves.
2. A snow ski, comprising:
 - an elongated ski member of one-piece metal construction;
 - said ski member being of uniform cross section along substantially the entire length of its ground engaging bottom surface; and
 - a pair of spaced longitudinal grooves provided in the bottom surface of said ski member extending sub-

stantially parallel to one another adjacent the outer edges of said bottom surface at the opposite sides thereof,

said bottom surface providing a substantially flat, continuous ground engaging surface between said grooves.

3. A snow ski, comprising:

an elongated ski member of one-piece aluminum construction having a length less than five feet;

said ski member being of uniform cross section along substantially the entire length of its ground engaging bottom surface; and

a pair of spaced longitudinal grooves provided in the bottom surface of said ski member extending substantially parallel to one another adjacent the outer edges of said bottom surface at the opposite sides thereof,

said bottom surface providing a substantially flat, continuous ground engaging surface between said grooves.

4. A snow ski, comprising:

an elongated ski member of one-piece aluminum construction;

said ski member being of uniform cross section along substantially the entire length of its ground engaging bottom surface; and

a pair of spaced longitudinal grooves provided in the bottom surface of said ski member extending substantially parallel to one another adjacent the outer edges of said bottom surface at the opposite sides thereof,

said bottom surface providing a substantially flat, continuous ground engaging surface between said grooves;

said ski member being anodized to provide an aluminum oxide coating on at least said bottom surface to reduce its coefficient of friction and to prevent snow from sticking thereto.

5. A snow ski, comprising:

an elongated ski body member of metal having a length between approximately three and four feet, and having an upwardly extending tip portion at one end of said ski member;

said ski member being of uniform cross section along substantially the entire length of its ground engaging bottom surface; and

a pair of spaced longitudinal channels provided in the bottom surface of said ski member and extending substantially parallel to each other adjacent the opposite sides of said ski member,

said bottom surface providing a substantially flat, continuous ground engaging surface between said grooves.

6. A snow ski, comprising:

an elongated ski body member of one-piece metal construction having a top surface and a bottom surface, and having an upwardly extending tip portion at one end of said ski member;

said ski member being of uniform cross section along substantially the entire length of its ground engaging bottom surface;

means for attaching a ski boot to the top surface of said ski member; and

a pair of spaced longitudinal channels provided in the bottom surface of said ski member and extending substantially parallel to each other adjacent the opposite sides of said ski member, each of said channels having a substantially triangular cross section formed by a first wall portion extending upward and outwardly and a second wall portion extending upward and inwardly from the outer edge at one side of said ski member,

said bottom surface providing a substantially flat, continuous ground engaging surface between said grooves.

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7. A snow ski, comprising:
 an elongated ski body member of one-piece aluminum alloy construction less than five feet in length having a top surface and a bottom surface which are anodized, and having an upwardly extending tip portion at one end of said ski member;
 said ski member being of uniform cross section along substantially the entire length of its ground engaging bottom surface,
 means for attaching a ski boot to the top surface of said ski member; and
 a pair of spaced longitudinal channels provided in the lower surface of said ski member and extending substantially parallel to each other adjacent the opposite sides of said ski member, each of said channels having a substantially triangular cross section formed by a first wall portion extending upward and outwardly and a second wall portion extending upward and inwardly from the outer edge at one side of said ski member,
 said bottom surface providing a substantially flat, continuous ground engaging surface between said grooves.

8. A method of manufacturing a one piece, all metal ski, comprising the steps of:
 forming an elongated flat ski body of metal;
 forming a pair of spaced grooves in the bottom surface of the ski body adjacent the outer edges at the opposite sides thereof and providing a flat, continuous ground engaging surface between said grooves;
 cutting said body to provide a pointed tip portion at the front end of the ski; and
 bending said tip portion upward from the bottom surface of said body.

9. A method of manufacturing a one piece, all metal ski, comprising the steps of:
 extruding metal through a die having a passageway conforming to the shape of the cross section of such ski to form a ski body, said die having a pair of spaced die portions projecting into said passageway in position to provide a pair of spaced grooves in the bottom surface of the ski adjacent the outer edges at the opposite sides thereof and providing a flat, continuous ground engaging surface between said grooves;
 cutting said body to provide a pointed tip portion at the front end of the ski; and
 bending said tip portion upward from the bottom surface of said body.

10. A method of manufacturing a one piece, all metal ski, comprising the steps of:
 extruding metal through a die having a passageway conforming to the shape of the cross section of such ski to form a ski body, said die having a pair of spaced die portions projecting into said passageway in position to provide a pair of spaced grooves in the bottom surface of the ski adjacent the outer edges at the opposite sides thereof and providing a flat, continuous ground engaging surface between said grooves;
 anodizing the ski body to provide a slick coating thereon;
 cutting said body to provide a pointed tip portion at the front end of the ski; and
 bending said tip portion upward from the bottom surface of said body.

11. A method of manufacturing a one piece, all metal ski, comprising the steps of:
 extruding aluminum through a die having a passageway conforming to the shape of the cross section of such ski to form a ski body, said die having a pair of spaced die portions projecting into said passageway in position to provide a pair of spaced grooves in the bottom surface of the ski adjacent the outer edges at the opposite sides thereof;
 anodizing the ski body to provide a coating of aluminum oxide thereon;
 cutting said body to provide a pointed tip portion at the front end of the ski;
 bending said tip portion upward from the bottom surface of said body; and
 bending a rear portion of said member at the rear end of the ski upward from the bottom surface of said body.

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