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(54) **SKI AND SNOWBOARD**

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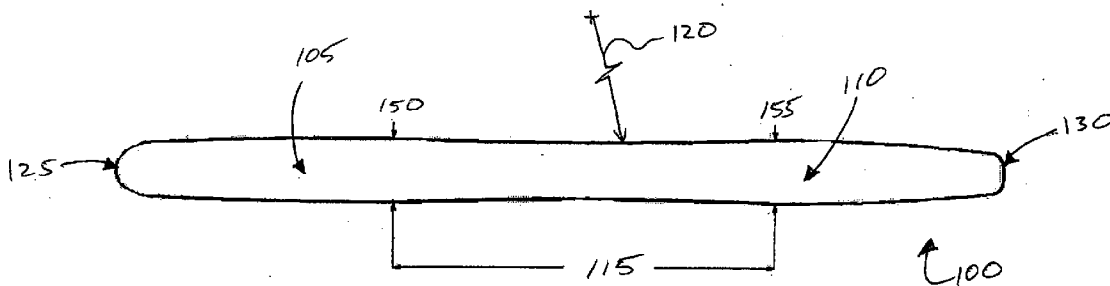
(57) **ABSTRACT**

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Skis and snowboards are provided. The ski or snowboard may include a first tip, a second tip, and a body. The body may be between the first tip and the second tip, and may have a width and a length, wherein the width may be variable along the length of the body. The body may include a front portion, a back portion, and a sidecut length having a turning radius of between about 50 meters and about 115 meters.

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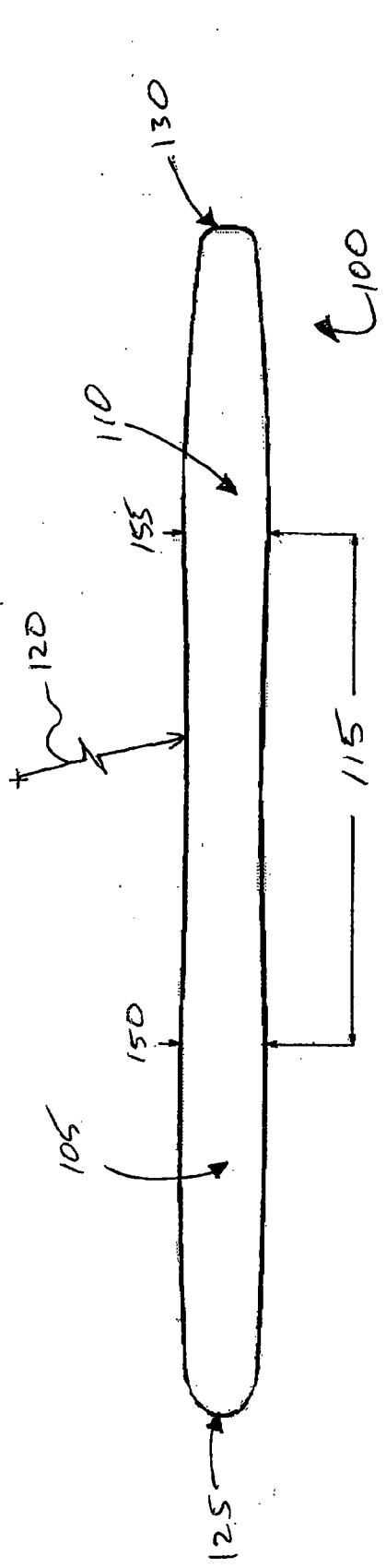


Fig. 1

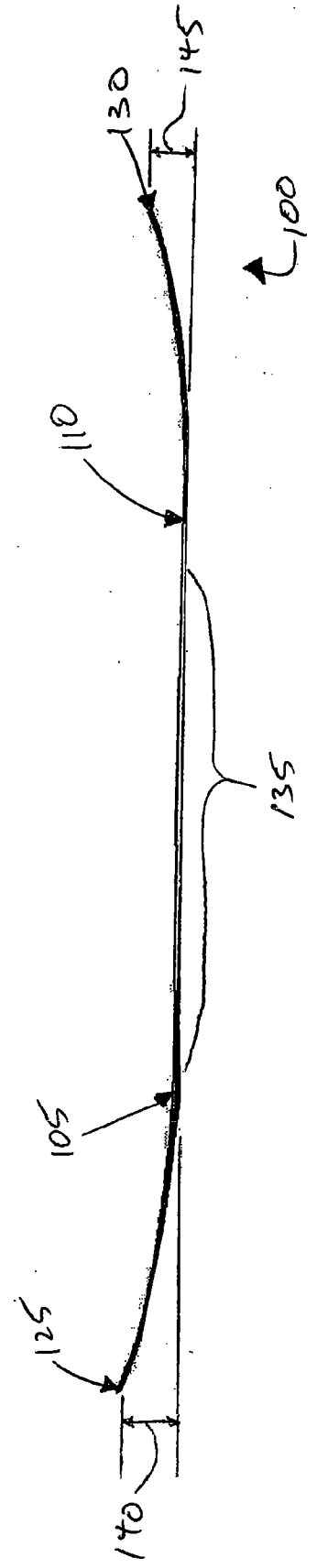


Fig. 2

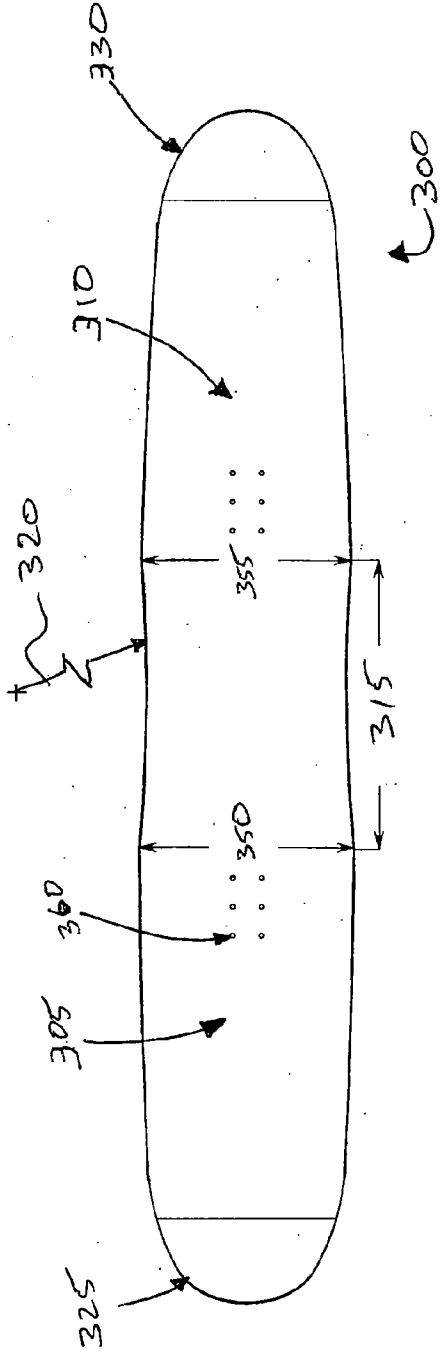


Fig. 3

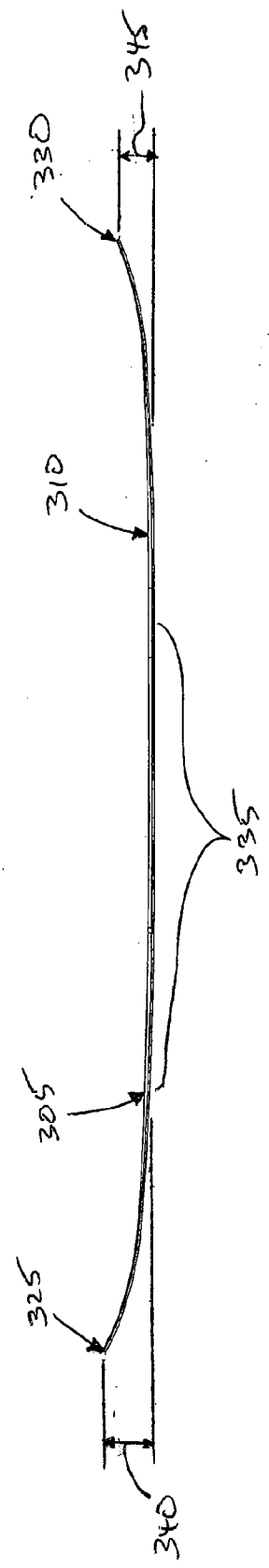


Fig. 4

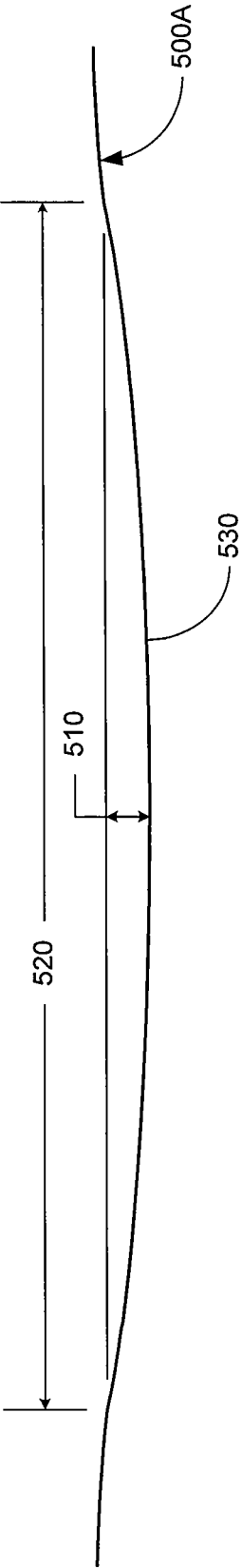


Fig. 5A

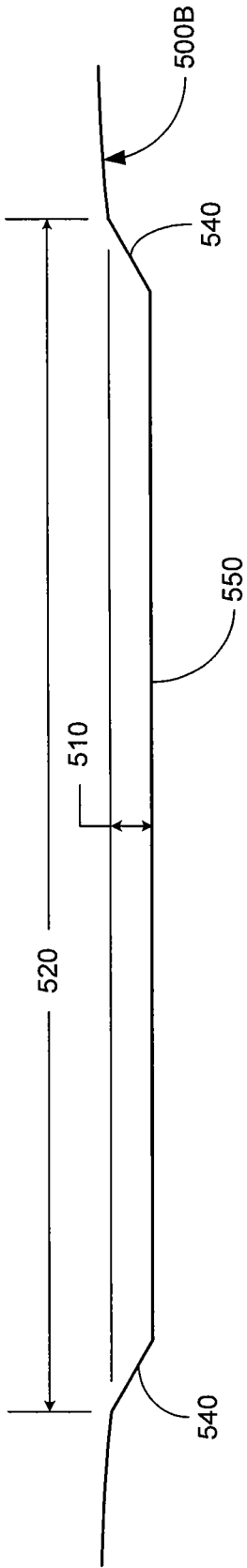


Fig. 5B

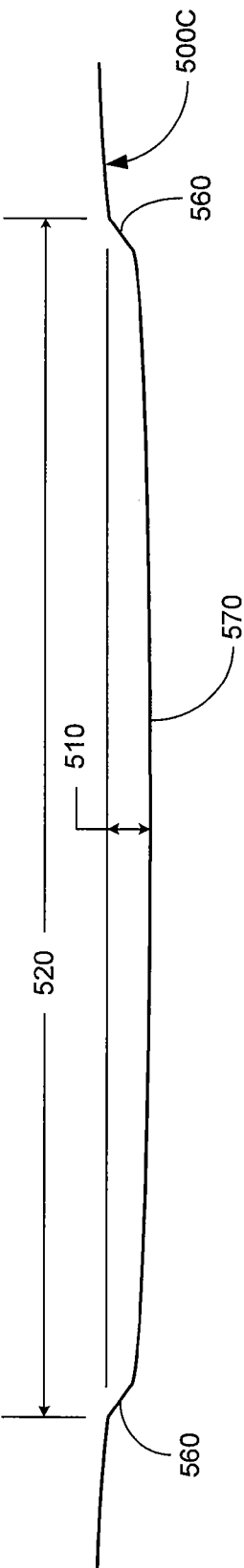


Fig. 5C

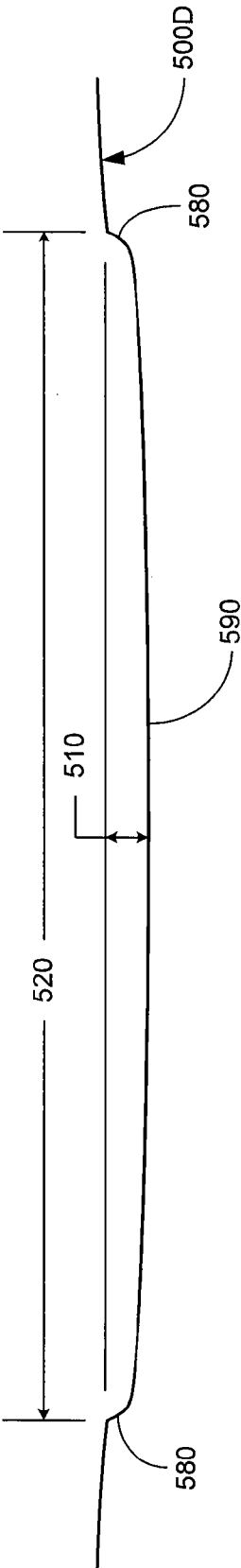


Fig. 5D

**SKI AND SNOWBOARD**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims priority to Provisional U.S. Patent Application No. 60/863,904 filed Nov. 1, 2006, entitled "SKI AND SNOWBOARD," the entire disclosure of which is hereby incorporated by reference, for all purposes, as if fully set forth herein.

**BACKGROUND OF THE INVENTION**

[0002] This invention relates generally to skis and snowboards. More specifically the invention relates to creating shaped skis and snowboards which provide higher performance on slopes with powdered snow accumulations.

[0003] Typical skis and snowboards known in the art are constructed such that they may perform well on a variety of surfaces, and particularly on hard surfaces such as packed and/or icy snow. Hard surfaces may be typical in areas such as the northeastern United States. However, in other climates, such as the Rocky Mountain region of the United States, powdered snow surfaces may be more common.

[0004] Powdered snow surfaces exhibit characteristics different from hard surfaces. Powdered snow tends to exhibit more liquid-type characteristics than hard surfaces, meaning that skis and snowboards will typically float across powdered snow, while also being subject to fluid drag forces. Additionally, turning in powder may be more difficult than on hard surfaces because of a lack of a defined cutting surface for the edge of the ski or snowboard. Embodiments of the present invention solve the aforementioned issues and other problems.

**BRIEF DESCRIPTION OF THE INVENTION**

[0005] In one embodiment of the invention, a ski is provided. The ski may include a first tip, a second tip, and a body between the first tip and the second tip. The body may have a width and a length, and the width may be variable along the length of the body. They body may also include a front portion, a back portion and a sidecut length having a turning radius of between about 50 meters and about 115 meters.

[0006] In another embodiment of the invention, a snowboard is provided. The snowboard may include a first tip, a second tip, and a body between the first tip and the second tip. The body may have a width and a length, and the width may be variable along the length of the body. They body may also include a front portion, a back portion and a sidecut length having a turning radius of between about 50 meters and about 115 meters.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0007] The present invention is described in conjunction with the appended figures:

[0008] FIG. 1 is a plan view of one ski embodiment of the invention;

[0009] FIG. 2 is a side view of the ski from FIG. 1;

[0010] FIG. 3 is a plan view of one snowboard embodiment of the invention;

[0011] FIG. 4 is a side view of the snowboard from FIG. 3;

[0012] FIG. 5A is a plan view of a portion of an edge of either a ski or snowboard of the invention having a generally continuously curved sidecut;

[0013] FIG. 5B is a plan view of a portion of an edge of either a ski or snowboard of the invention having a sidecut with three linear segments;

[0014] FIG. 5C is a plan view of a portion of an edge of either a ski or snowboard of the invention having a sidecut with both linear and curved segments; and

[0015] FIG. 5D is a plan view of a portion of an edge of either a ski or snowboard of the invention having tightly curved entry and exit segments, and a broad middle segment.

**DETAILED DESCRIPTION OF THE INVENTION**

[0016] The ensuing description provides exemplary embodiments only, and is not intended to limit the scope, applicability or configuration of the disclosure. Rather, the ensuing description of the exemplary embodiments will provide those skilled in the art with an enabling description for implementing one or more exemplary embodiments. It being understood that various changes may be made in the function and arrangement of elements without departing from the spirit and scope of the invention as set forth in the appended claims.

[0017] Specific details are given in the following description to provide a thorough understanding of the embodiments. However, it will be understood by one of ordinary skill in the art that the embodiments may be practiced without these specific details. For example, well-known structures, and techniques may be shown without unnecessary detail in order to avoid obscuring the embodiments.

[0018] Though skis and snowboards will primarily be discussed throughout the detailed description, it should be noted that the concepts herein are also applicable to other snow sports equipment, including variants of skis such as ski boards and monoskis.

[0019] In one embodiment of the invention, a ski is provided. The ski may include a first tip, a second tip, and a body between the first tip and the second tip. The body may have a width and a length, and the width may be variable along the length of the body. They body may also include a front portion, a back portion and a sidecut length having a turning radius of between about 50 meters and about 115 meters.

[0020] In some embodiments, the sidecut length may have a turning radius of between about 81 meters and about 115 meters. In an exemplary embodiment, the sidecut length may have a turning radius of about 112 meters. If the turning radius is smaller than these ranges, then stability at high speeds in powdered snow conditions will be compromised, causing ski chatter and lack of control in turns. If the turning radius is larger than these ranges, then turning will be increasingly difficult on hard or icy snow surfaces.

[0021] In some embodiments, the widest part of the front portion may not be equal in width to the widest part of the back portion. In an exemplary embodiment, the widest part of the front portion may be wider than the widest part of the back portion.

[0022] In some embodiments, the width of the body between the front portion and the back portion may be

between about 90 millimeters and about 180 millimeters. In these or other embodiments, the width of the widest part of the front portion may be between about 80 millimeters and about 180 millimeters. The width of the widest part of the back portion may be between about 70 millimeters and about 160 millimeters.

[0023] In some embodiments, the body may have a positive camber between about 0 millimeters and about 6 millimeters. In an exemplary embodiment, the body may have a positive camber of about 6 millimeters.

[0024] In some embodiments, when the ski is laying on a surface, the first tip may rise about 90 millimeters above the surface over the last about 300 millimeters to about 1000 millimeters of total ski length. In these or other embodiments, the second tip may rise about 80 millimeters above the surface over the last about 250 millimeters to about 800 millimeters of ski length. In some embodiments the first tip may nominally be the front tip of the ski, and the second tip may nominally be the back tip of the ski.

[0025] In some embodiments, the first tip and/or second tip may be curved in substantially the same radius as a portion of the body. In other embodiments, the first tip and/or second tip may be curved in a smaller radius than a portion of the body.

[0026] In another embodiment of the invention, a snowboard is provided. The snowboard may include a first tip, a second tip, and a body between the first tip and the second tip. The body may have a width and a length, and the width may be variable along the length of the body. They body may also include a front portion, a back portion and a sidecut length having a turning radius of between about 50 meters and about 115 meters.

[0027] In some embodiments, the sidecut length may have a turning radius of between about 81 meters and about 115 meters. In an exemplary embodiment, the sidecut length may have a turning radius of about 112 meters.

[0028] In some embodiments, the widest part of the front portion may not be equal in width to the widest part of the back portion. In an exemplary embodiment, the widest part of the front portion may be wider than the widest part of the back portion.

[0029] In some embodiments, the width of the body between the front portion and the back portion may be between about 250 millimeters and about 375 millimeters. In these or other embodiments, the width of the widest part of the front portion may be between about 275 millimeters and about 350 millimeters. In an exemplary embodiment, the front portion may be about 300 millimeters at its widest point. The width of the widest part of the back portion may be between about 275 millimeters and about 350 millimeters. In an exemplary embodiment, the back portion may be about 293 millimeters at its widest point.

[0030] In some embodiments, the body may have a positive camber between about 0 millimeters and about 6 millimeters. In an exemplary embodiment, the body may have a positive camber of about 6 millimeters.

[0031] In some embodiments, when the snowboard is laying on a surface, the first tip may rise about 64 millimeters above the surface over the last about 100 millimeters to about 650 millimeters of total snowboard length. In these or other embodiments, the second tip may rise about 50 millimeters

above the surface over the last about 50 millimeters to about 400 millimeters of snowboard length. In some embodiments, the first tip may nominally be the front tip of the snowboard, and the second tip may nominally be the back tip of the snowboard.

[0032] In some embodiments, the first tip and/or second tip may be curved in substantially the same radius as a portion of the body. In other embodiments, the first tip and/or second tip may be curved in a smaller radius than a portion of the body.

[0033] The thickness and flexibility may depend on the construction method and materials used to fabricate the ski or snowboard. In some embodiments, wood, glass fiber, Kevlar, titanium, polymer, plastic, metal, and/or composite materials may be selectively used to construct the ski or snowboard so as to have a flexibility desirable for certain applications of the equipment.

[0034] Turning now to FIG. 1 and FIG. 2, a plan and side view of one possible ski 100 of the invention is shown. Front portion 105 and rear portion 110 may have a reverse sidecut on each side of the ski 100 (a reverse sidecut is a curve the arcs outward at its apex from the center of the ski). A portion of ski 100 between front portion 105 and rear portion 110 may have a positive sidecut on each side of the ski 100 (a positive sidecut is a curve that arcs inward at its apex toward the center of the ski). The geometry of front portion 105, back portion 110, and any other portion of ski 100 may, or may not be, substantially curved. For instance, the portion of ski 100 between front portion 105 and rear portion 110 may include one or more linear segments and/or one or more curved segments.

[0035] Ski 100 may have a sidecut length 115 which has a turning radius 120 of between about 50 meters and about 115 meters. Sidecut length 115 may include portions of front portion 105 and rear portion 110. A first tip 125 and a second tip 130 may be at either ends of ski 100. The center of ski 100 may have a positive camber 135 as discussed above. Positive camber 135 may result in the center portion of ski 100 not touching a surface beneath ski 100 when in an unloaded condition.

[0036] The widest part 150 of front portion 105 may not be equal in width to the widest part 155 of back portion 110. In an exemplary embodiment, the widest part 150 of front portion 105 may be wider than the widest part 155 of back portion 110.

[0037] In some embodiments, when ski 100 is laying on a surface, the first tip may rise a distance shown by dimensional arrow 140 above the surface, over some portion of the ski length. The second tip may rise a distance shown by dimensional arrow 145 above the surface, over some portion of the ski length.

[0038] In FIG. 3 and FIG. 4, a plan and side view of one possible snowboard 300 of the invention is shown. Front portion 305 and rear portion 310 may have a reverse sidecut on each side of the snowboard 300 (a reverse sidecut is a curve the arcs outward at its apex from the center of the snowboard). A portion of snowboard 300 between front portion 305 and rear portion 310 may have a positive sidecut on each side of the snowboard 300 (a positive sidecut is a curve that arcs inward at its apex toward the center of the snowboard). The geometry of front portion 305, back portion 310, and any other portion of snowboard 300 may, or may not be, substan-

tially curved. For instance, the portion of snowboard 300 between front portion 305 and rear portion 310 may include one or more linear segments and/or one or more curved segments.

[0039] Snowboard 300 may have a sidecut length 315 which has a turning radius 320 of between about 50 meters and about 315 meters. Sidecut length 315 may include portions of front portion 305 and rear portion 310. A first tip 325 and a second tip 330 may be at either ends of the snowboard. The center of snowboard 300 may have a positive camber 335 as discussed above. Positive camber 335 may result in the center portion of snowboard 300 not touching a surface beneath snowboard 300 when in an unloaded condition.

[0040] The widest part 350 of front portion 305 may not be equal in width to the widest part 355 of back portion 310. In an exemplary embodiment, the widest part 350 of front portion 305 may be wider than the widest part 355 of back portion 310.

[0041] In some embodiments, when snowboard 300 is laying on a surface, the first tip may rise a distance shown by dimensional arrow 340 above the surface, over some portion of the snowboard length. The second tip may rise a distance shown by dimensional arrow 345 above the surface, over some portion of the snowboard length. Also shown on FIG. 3 are binding mounting points 360, possibly threaded cavities. Binding mounting points 360 may allow a user to couple bindings to snowboard 300.

[0042] In FIG. 5A, a plan view a portion of an edge 500A of either a ski or snowboard of the invention is shown. Edge 500A may include a sidecut 530 having a single curved perimeter. The sidecut may have a depth shown by dimensional arrow 510, and a length shown by dimensional arrow 520. Depth 510, and length 520 may correspond to a certain turning radius. Merely by way of example, a 1500 millimeter long ski or snowboard, which have a turning radius of 112 meters, may have a sidecut length of 600 millimeters, and a sidecut depth of 0.40 millimeters. A 1750 millimeter long ski or snowboard, which has a turning radius of 112 meters may have a sidecut length of 800 millimeters, and a sidecut depth of 0.71 millimeters. By knowing two of (1) the length of the sidecut, (2) the depth of the sidecut, and (3) the turning radius, the remaining variable can be determined by the equation:  $\text{length} = 2\sqrt{\text{depth}(2\text{radius} - \text{depth})}$ . The length of the sidecut may be proportional to the length of the ski or snowboard and may be between about 40% and about 50% of the overall length of the ski and between about 25% and about 50% of the overall length of the snowboard. In exemplary embodiments, the length of the sidecut may be about 43% of the overall length of the ski, and about 25% of the overall length of the snowboard.

[0043] In FIG. 5B, a plan view a portion of an edge 500B of another ski or snowboard of the invention is shown. Edge 500B may include a sidecut having a three liner segments, entry and exit segments 540, and mid-segment 550. This sidecut may also have a depth shown by dimensional arrow 510, and a length shown by dimensional arrow 520. Depth 510, and length 520 may correspond to a certain turning radius. Though the sidecut of edge 500B has a different profile than edge 500A, if depth 510 and length 520 are the same in each embodiment, similar turning radiuses may be realized. In other embodiments, different profiles having the same dimensions may also allow for the realization of different effective turning radiuses.

[0044] In FIG. 5C, a plan view a portion of an edge 500C of another ski or snowboard of the invention is shown. Edge 500C may include a sidecut having a two liner segments, entry and exit segments 560, and a curved mid-segment 570. This sidecut may also have a depth shown by dimensional arrow 510, and a length shown by dimensional arrow 520. Depth 510, and length 520 may correspond to a certain turning radius. Though the sidecut of edge 500B has a different profile than edge 500A and edge 500B, if depth 510 and length 520 are the same in each embodiment, similar turning radiuses may be realized. In other embodiments, different profiles having the same dimensions may also allow for the realization of different effective turning radiuses.

[0045] In FIG. 5D, a plan view a portion of an edge 500D of another ski or snowboard of the invention is shown. Edge 500D may include a sidecut having a three curved segments, tightly curved entry and exit segments 580, and a less-tightly curved mid-segment 590. This sidecut may also have a depth shown by dimensional arrow 510, and a length shown by dimensional arrow 520. Depth 510, and length 520 may correspond to a certain turning radius. Though the sidecut of edge 500D has a different profile than edge 500A, edge 500B, and edge 500C, if depth 510 and length 520 are the same in each embodiment, similar turning radiuses may be realized. In other embodiments, different profiles having the same dimensions may also allow for the realization of different effective turning radiuses.

[0046] The invention has now been described in detail for the purposes of clarity and understanding. However, it will be appreciated that certain changes and modifications may be practiced within the scope of the appended claims.

What is claimed is:

1. A ski, wherein the ski comprises:

a first tip;

a second tip; and

a body between the first tip and the second tip, having a width and a length, wherein the width is variable along the length of the body, and wherein the body comprises:

a front portion;

a back portion; and

a sidecut length having a turning radius of between about 50 meters and about 115 meters.

2. The ski of claim 1, wherein the sidecut length has a turning radius of between about 81 meters and about 115 meters.

3. The ski of claim 1, wherein the sidecut length has a turning radius of about 112 meters.

4. The ski of claim 1, wherein the widest part of the front portion is wider than the widest part of the back portion.

5. The ski of claim 1, wherein the width of the body between the front portion and the back portion is between about 90 millimeters and about 180 millimeters.

6. The ski of claim 1, wherein the width of the widest part of the front portion is between about 80 millimeters and about 180 millimeters.

7. The ski of claim 1, wherein the width of the widest part of the back portion is between about 70 millimeters and about 160 millimeters.

8. The ski of claim 1, wherein the body has a positive camber of about 6 millimeters.



9. The ski of claim 1, wherein when the ski is laying on a surface, the first tip will rise about 90 millimeters above the surface over the last about 300 millimeters to about 1000 millimeters of ski length.

10. The ski of claim 1, wherein when the ski is laying on a surface, the second tip will rise about 80 millimeters above the surface over the last about 250 millimeters to about 800 millimeters of ski length.

11. The ski of claim 1, wherein the first tip is curved in a smaller radius than a portion of the body.

12. The ski of claim 1, wherein the second tip is curved in a smaller radius than a portion of the body.

13. A snowboard, wherein the snowboard comprises:

a first tip;

a second tip; and

a body between the first tip and the second tip, having a width and a length, wherein the width is variable along the length of the body, and wherein the body comprises:

a front portion;

a back portion; and

a sidecut length having a turning radius of between about 50 meters and about 115 meters.

14. The snowboard of claim 13, wherein the sidecut length has a turning radius of between about 81 meters and about 115 meters.

15. The snowboard of claim 13, wherein the sidecut length has a turning radius of about 112 meters.

16. The snowboard of claim 13, wherein the widest part of the front portion is wider than the widest part of the back portion.

17. The snowboard of claim 13, wherein the width of the body between the front portion and the back portion is between about 250 millimeters and about 375 millimeters.

18. The snowboard of claim 13, wherein the width of the widest part of the front portion is between about 275 millimeters and about 300 millimeters.

19. The snowboard of claim 13, wherein the width of the widest part of the front portion is about 300 millimeters.

20. The snowboard of claim 13, wherein the width of the widest part of the back portion is between about 275 millimeters and about 300 millimeters.

21. The snowboard of claim 13, wherein the width of the widest part of the back portion is about 293 millimeters.

22. The snowboard of claim 13, wherein when the snowboard is laying on a surface, the first tip will rise about 64 millimeters above the surface over the last about 100 millimeters to about 650 millimeters of snowboard length.

23. The snowboard of claim 13, wherein when the snowboard is laying on a surface, the second tip will rise about 50 millimeters above the surface over the last about 50 millimeters to about 400 millimeters of snowboard length.

24. The snowboard of claim 13, wherein the first tip is curved in a smaller radius than a portion of the body.

25. The snowboard of claim 13, wherein the second tip is curved in a smaller radius than a portion of the body.

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