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(54) **SNOWMOBILE SKI SYSTEM**

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(57) **ABSTRACT**

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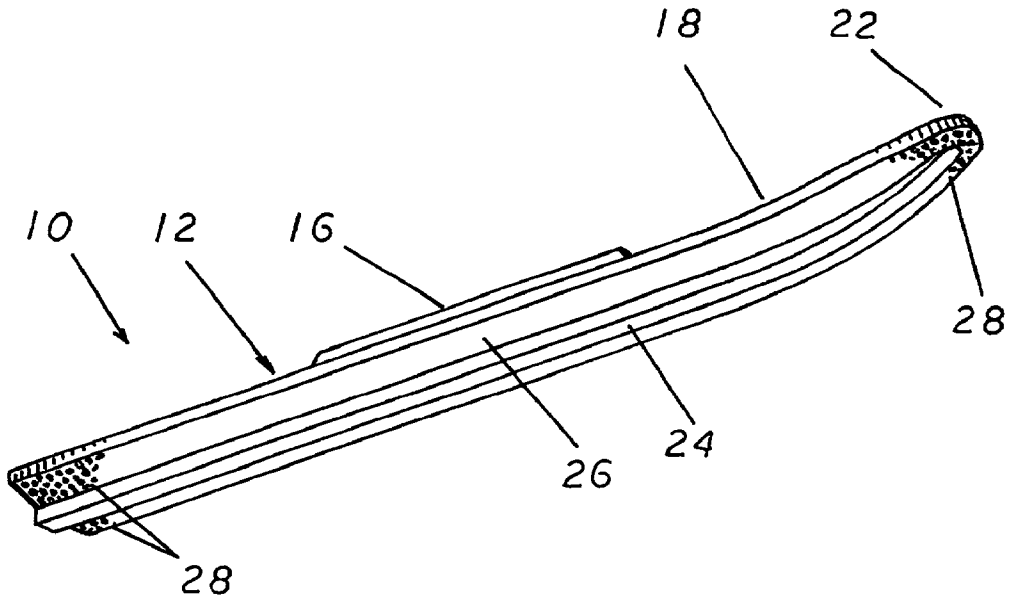
A snowmobile ski system for reducing frictional resistance and improving overall control of a snowmobile ski. The snowmobile ski system includes a ski having a body, a lower surface, an upper surface, a saddle, and a plurality of dimples within the lower surface of the ski. The plurality of dimples may have various shapes, sizes, depths, designs and patterns to assist in reducing the frictional resistance of the ski upon a snow surface. The plurality of dimples within the lower surface of the ski create a plurality of air pockets between the lower surface and the snow surface during forward travel.

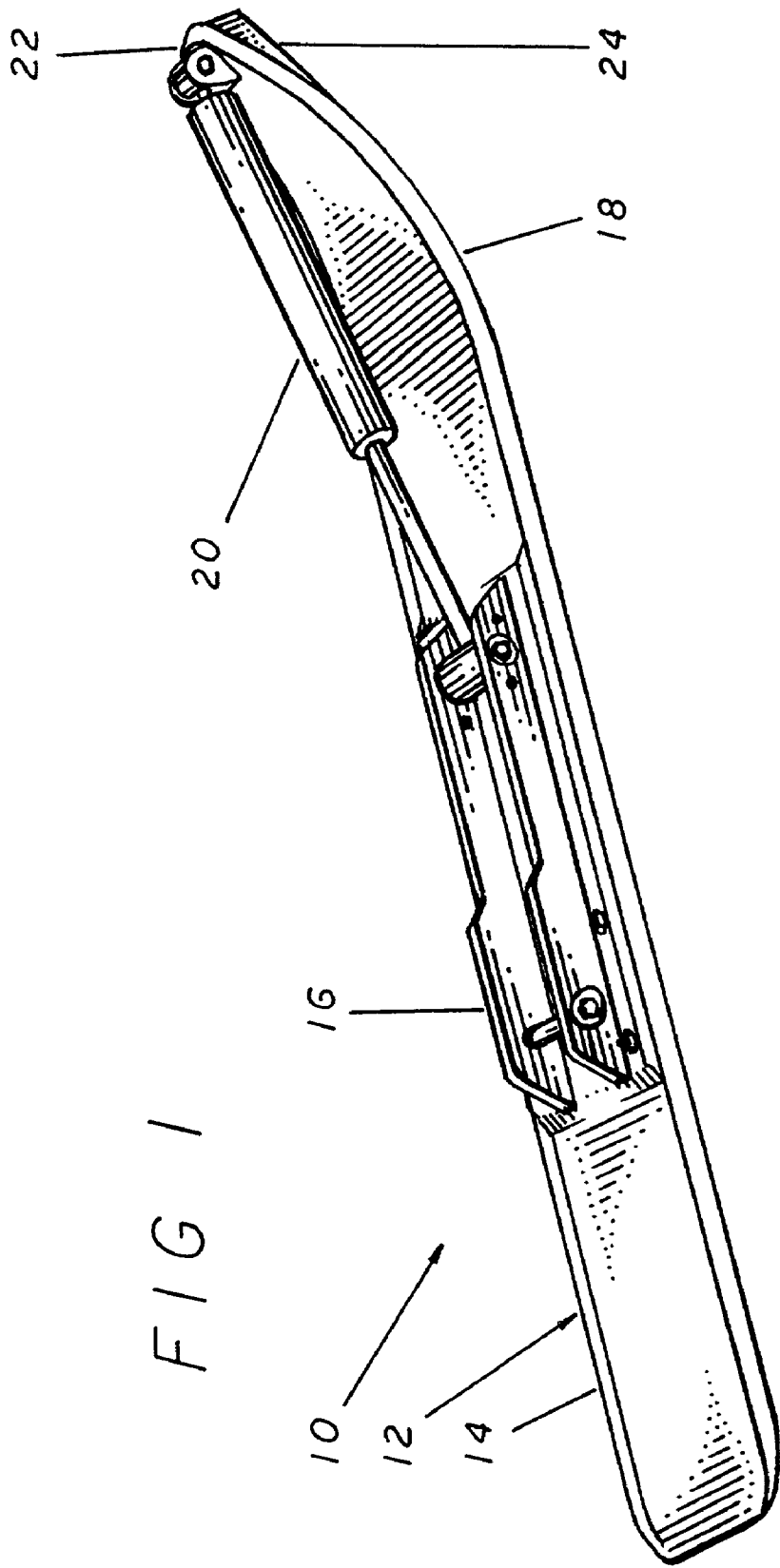
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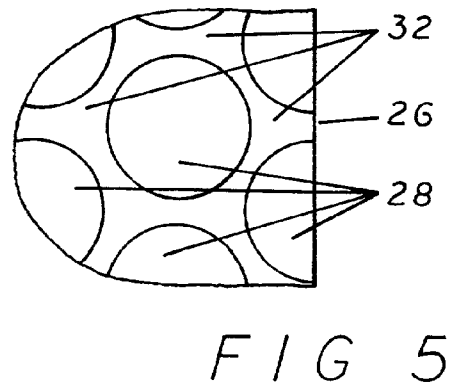
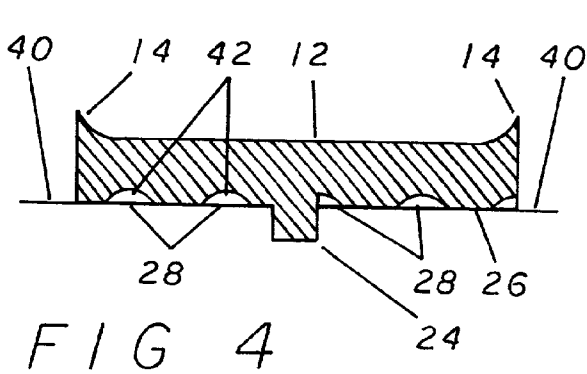
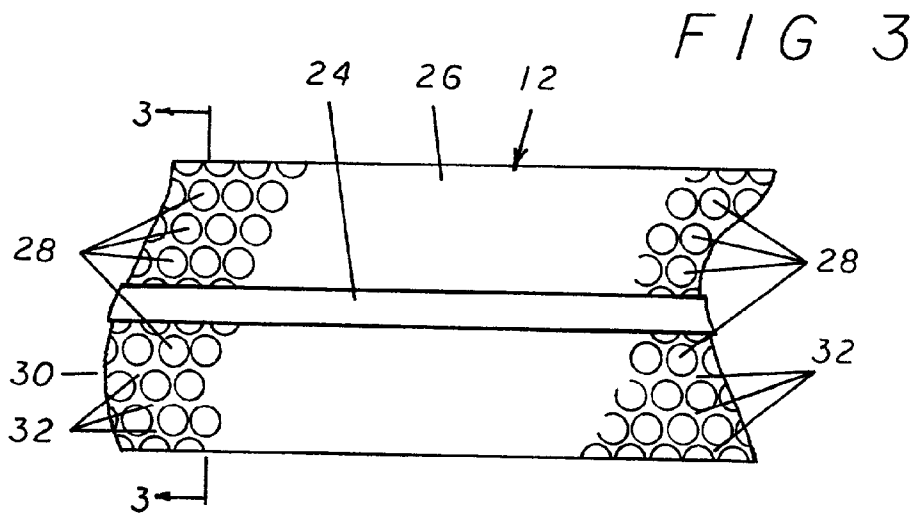
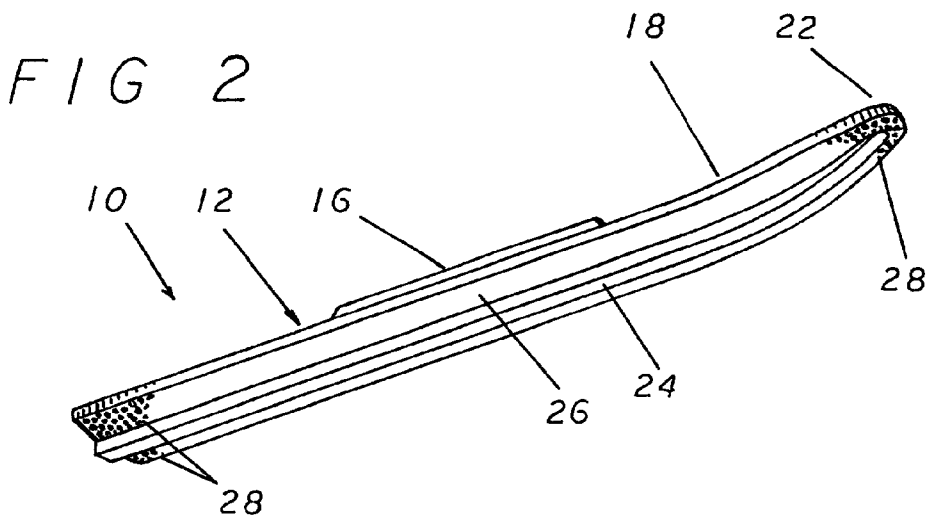
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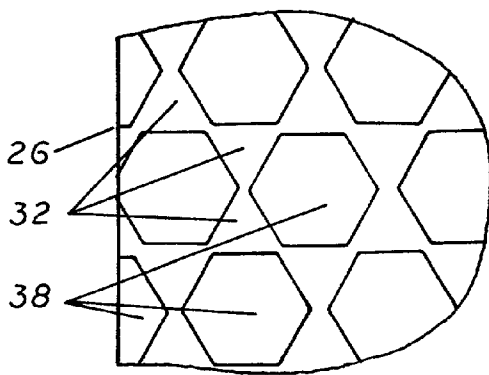
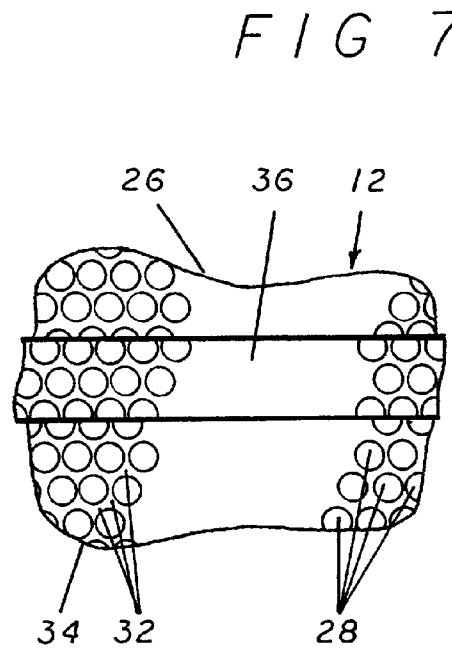
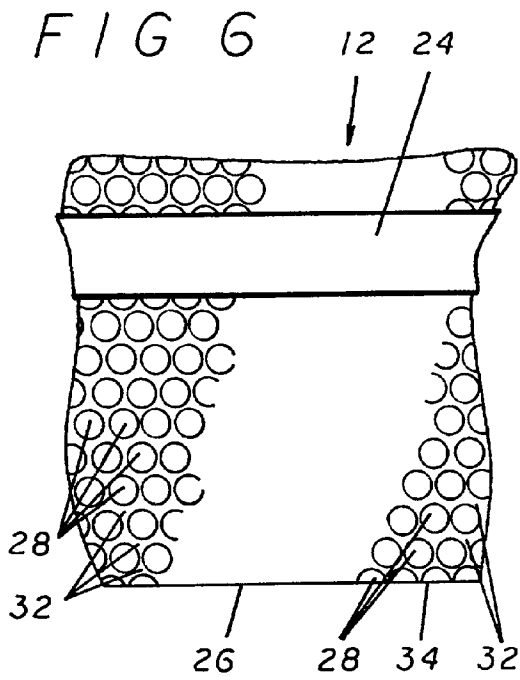


FIG 8

SNOWMOBILE SKI SYSTEM

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates generally to snowmobile skis and more specifically it relates to a snowmobile ski system for reducing frictional resistance and improving overall control of a snowmobile ski.

[0003] 2. Description of the Prior Art

[0004] Snowmobiles are powered by a front mounted engine attached to a rear endless track system. The track on conventional snowmobiles is suspended using springs and gas powered shocks to absorb the bumps and aid in control and handling of the snowmobile. These snowmobiles are typically supplied with two skis attached to a rider operated steering system. The skis are placed in front of the track system and are, thus, the first part of the vehicle to meet obstacles such as rocks, logs and bumps.

[0005] Conventional skis utilized upon snowmobiles and the like are comprised of an elongate structure that is curved upwardly toward the front end and are relatively flat in structure from the middle portion to the rear portion thereof. The lower surface of conventional skis are comprised of a flat surface with one or more keels along with a wear bar attached thereto. Conventional skis may be constructed of various types of materials including but not limited to plastic and metal.

[0006] While these devices may be suitable for the particular purpose to which they address, they are not as suitable for reducing frictional resistance and improving overall control of a snowmobile ski. Conventional snowmobile skis create unnecessary resistance between a snow surface during travel.

[0007] In these respects, the snowmobile ski system according to the present invention substantially departs from the conventional concepts and designs of the prior art, and in so doing provides an apparatus primarily developed for the purpose of reducing frictional resistance and improving overall control of a snowmobile ski.

SUMMARY OF THE INVENTION

[0008] In view of the foregoing disadvantages inherent in the known types of skis now present in the prior art, the present invention provides a new snowmobile ski system construction wherein the same can be utilized for reducing frictional resistance and improving overall control of a snowmobile ski.

[0009] The general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new snowmobile ski system that has many of the advantages of the skis mentioned heretofore and many novel features that result in a new snowmobile ski system which is not anticipated, rendered obvious, suggested, or even implied by any of the prior art skis, either alone or in any combination thereof.

[0010] To attain this, the present invention generally comprises a ski having a body, a lower surface, an upper surface, a saddle, and a plurality of dimples within the lower surface of the ski. The plurality of dimples may have various shapes,

sizes, depths, designs and patterns to assist in reducing the frictional resistance of the ski upon a snow surface. The plurality of dimples within the lower surface of the ski create a plurality of air pockets between the lower surface and the snow surface during forward travel.

[0011] There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the invention that will be described hereinafter and that will form the subject matter of the claims appended hereto.

[0012] In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of the description and should not be regarded as limiting.

[0013] A primary object of the present invention is to provide a snowmobile ski system that will overcome the shortcomings of the prior art devices.

[0014] A second object is to provide a snowmobile ski system for reducing frictional resistance and improving overall control of a snowmobile ski.

[0015] Another object is to provide a snowmobile ski system that effectively reduces the overall frictional resistance of a snowmobile ski.

[0016] An additional object is to provide a snowmobile ski system that assists in increasing the overall fuel efficiency of a motor vehicle that utilizes skis such as a snowmobile.

[0017] A further object is to provide a snowmobile ski system that creates a plurality of air pockets between the body of the ski and a surface of snow to support the snowmobile ski with reduced friction.

[0018] Another object is to provide a snowmobile ski system that may have various dimple patterns that affect the overall performance of the ski depending upon the snow and weather conditions.

[0019] Other objects and advantages of the present invention will become obvious to the reader and it is intended that these objects and advantages are within the scope of the present invention.

[0020] To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated and described within the scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] Various other objects, features and attendant advantages of the present invention will become fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in

which like reference characters designate the same or similar parts throughout the several views, and wherein:

[0022] FIG. 1 is an upper perspective view of the upper surface present invention.

[0023] FIG. 2 is a lower perspective view of the present invention disclosing the plurality of dimples within the lower surface of the ski.

[0024] FIG. 3 is a bottom view of the present invention.

[0025] FIG. 4 is a cross sectional view taken along line 3-3 of FIG. 3 illustrating the dimple structure.

[0026] FIG. 5 is a magnified bottom view illustrating one possible configuration of the dimples.

[0027] FIG. 6 is a magnified bottom view of the present invention illustrating an alternative embodiment of the invention wherein the dimple pattern utilizes a larger number of dimples having a smaller size.

[0028] FIG. 7 is a magnified bottom view of the present invention illustrating another alternative embodiment of the invention that illustrates a plurality of dimples upon a keel.

[0029] FIG. 8 is a magnified bottom view of another alternative embodiment of the present invention illustrating hexagonal shaped dimples.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0030] Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. 1 through 8 illustrate a snowmobile ski system 10, which comprises a ski having a body 12, a lower surface 26, an upper surface, a saddle, and a plurality of dimples within the lower surface of the ski. The plurality of dimples may have various shapes, sizes, depths, designs and patterns to assist in reducing the frictional resistance of the ski upon a snow surface. The plurality of dimples within the lower surface of the ski create a plurality of air pockets between the lower surface and the snow surface during forward travel.

[0031] The ski body 12 and the ski saddle 16 are preferably formed from one piece of UHMW plastic in a manner so that the natural state of the present invention is flat along the entire length in regards to the upper surface of the ski body 12. It can be appreciated that the ski body 12 may be constructed of various other types of materials and structures that are commonly utilized to construct snow type skis utilized for motor vehicles such as snowmobiles.

[0032] The most forward section of the ski body 12 is bent upward or "pre-loaded" at the flex zone 18 to form the upwardly curved ski tip 22 of a typical snowmobile ski. The forward portion of the ski body 12 is then held in this position by the use of the pre-load apparatus 20 or loop structure commonly utilized upon skis which spans the distance between the ski tip 22 and the forward end of the ski saddle 16 and maintains the pre-set orientation between the two. This method of construction provides the classic configuration of a typical snowmobile ski with the upwardly bent ski tip 22 that allows a ski to move through snow efficiently. Additionally, the flexible nature of the ski body 12 allows it to flex in this area that enables the present invention to remain in contact with the surface of the snow

40 with greater regularity when encountering bumps or other surface irregularities. It should further be stated at this point the use of the current invention is relevant to all types of plastic skis and may also be used on ski skins.

[0033] The general construction of the lower surface of the ski body 12, or the flat ski bottom 26, is further illustrated in FIGS. 2, 3, 4, and 5. The keel 24 extends from just behind the ski tip 22 to the rearward most portion of the ski body 12 as shown in FIG. 2 of the drawings. The keel 24 functions to keep the ski body 12 traveling in the intended line of travel which is controlled through the steering inputs of the snowmobile operator and, in the standard configuration, is not equipped with the plurality of dimples 28 that cover the remaining surface of the flat ski bottom 26.

[0034] Further, these figures detail the manner in which the individual dimples 28 are distributed across the surface of the flat ski bottom 26 in a large dimple pattern 30. The individual round dimples 28 are distributed across the flat ski bottom 26 in a manner as to allow a significant portion of that surface to remain in the form of the inter-dimple surface 32. The inter-dimple surface 32 is the portion of the present invention that actually contacts the surface of the snow 40 during snowmobile operation.

[0035] It can be appreciated that the plurality of dimples 28 may cover the entire bottom surface 26, portions of the bottom surface 26, one or more sections of the bottom surface 26 and various combinations thereof. The plurality of dimples 28 are preferably circular and concaved, however various shapes and structures may be utilized to construct the dimples 28 to create the same effect as can be appreciated.

[0036] The plurality of dimples 28 may be comprised of a consistent size or various sizes throughout the bottom surface. The plurality of dimples 28 may be comprised of a consistent shape or various shapes throughout the bottom surface. The plurality of dimples 28 may also be comprised of a consistent depth or various depths throughout the bottom surface.

[0037] The important aspect of this design is that the presence of the dimples 28 on the flat ski bottom 26 lessens the amount of the ski body 12 that is in actual contact with the surface of the snow 40. This lessening of the ski body 12 contact area reduces the amount of actual drag created by the contact between the ski body 12 and the surface of the snow 40 and so lessens the overall drag created by a snowmobile being driven over a snow covered surface. Additionally, the remaining inter-dimple surface 32 that contacts the surface of the snow 40 is sufficient to provide the steering control to the operator of the snowmobile in all types of snow and weather conditions that may be encountered.

[0038] The affect of the dimples 28 themselves on the operation of the present invention is a result of their interaction with air that becomes trapped under the ski body 12 as it passes over a snow covered surface. Each of the individual dimples 28 traps a small air pocket 42 (as further illustrated in FIG. 4) between the ski body 12 and the surface of the snow 40. This air pocket 42 is slightly compressed by the passage of the ski body 12 and creates a slight cushion of air between the flat ski bottom 26 and the surface of the snow 40. Thus, the cushion of air between the ski body 12 and the surface of the snow 40 also functions,

along with the reduction of surface contact area, to reduce the drag created by the present invention during the operation of a typical snowmobile as it is driven over the surface of the snow 40.

[0039] An alternative embodiment of the present invention is illustrated in FIG. 6 in which the large dimple pattern 30 illustrated in the previous embodiment are replaced by a small dimple pattern 34. The small dimple pattern 34 is substantially similar to the large dimple pattern 40 with the exception that a larger number of smaller individual dimples 28 are used cover the surface of the flat ski bottom 26. The use of the small dimple pattern 34 as opposed to the large dimple pattern 30 does not affect the overall performance of the present invention as the total area of the inter-dimple surface is not greatly affected. The use of the small dimple pattern 34 can however affect the performance characteristics of the present invention. Therefore, by changing the dimple 28 pattern that is used to cover the bottom surface of the ski body 12, the snowmobile operator can alter the handling characteristics to conform to the existing snow and weather conditions. FIG. 6 also illustrates the use of the keel 24 as a directional stability device with the small dimple pattern 34 as used in conjunction with the present invention.

[0040] An additional embodiment of the present invention is illustrated in FIG. 7 in which a dimpled keel 36 is used in conjunction with the small dimple pattern 34 on the flat ski bottom 26 of the ski body 12. In this configuration, the small dimple pattern 34 employed on the flat ski bottom 26 is simply continued on all of the surfaces of the dimpled keel 36. The use of the dimples 28 on the surface of the dimpled keel 36 transfers the drag reducing characteristics of the remainder of the present invention to the surface of the dimpled keel 36 which further lessens the effect of drag on the operation of a snowmobile in all kinds of snow and weather conditions.

[0041] Finally, a still further embodiment of the present invention is illustrated in FIG. 8 in which the flat ski bottom 26 is equipped with a large number of hexagonal dimples 38 as opposed to the circular dimples 28 described with the previous embodiments. The most important factor of this embodiment of the present invention is to illustrate that any number of dimple 28 designs may be used for any number of reasons, some of which may actually affect the operation of the present invention. This provides a snowmobile operator with an additional method by which he can alter the performance characteristics of the snowmobile to match existing conditions.

[0042] As to a further discussion of the manner of usage and operation of the present invention, the same should be apparent from the above description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

[0043] With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed to be within the expertise of those skilled in the art, and all equivalent structural variations and relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

[0044] Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

I claim:

1. A snowmobile ski system, comprising:
 - a snowmobile ski having a lower surface and an upper surface; and
 - a plurality of dimples within said lower surface of said snowmobile ski.
2. The snowmobile ski system of claim 1, wherein said plurality of dimples cover at least fifty-percent of said lower surface.
3. The snowmobile ski system of claim 2, wherein said plurality of dimples cover at least ninety-percent of said lower surface.
4. The snowmobile ski system of claim 2, wherein said plurality of dimples have a circular shape.
5. The snowmobile ski system of claim 4, wherein said plurality of dimples are concave.
6. The snowmobile ski system of claim 5, wherein said plurality of dimples are randomly positioned within said lower surface.
7. The snowmobile ski system of claim 5, wherein said plurality of dimples are positioned within a pattern within said lower surface.
8. The snowmobile ski system of claim 1, wherein said plurality of dimples are comprised of at least two sections separated a finite distance from one another.
9. The snowmobile ski system of claim 1, wherein said plurality of dimples are comprised of a consistent size.
10. The snowmobile ski system of claim 9, wherein said plurality of dimples are comprised of a consistent shape.
11. The snowmobile ski system of claim 10, wherein said plurality of dimples are comprised of a consistent pattern.
12. The snowmobile ski system of claim 11, wherein said plurality of dimples are circular in shape.
13. The snowmobile ski system of claim 11, wherein said plurality of dimples are comprised of a polygon shape.
14. The snowmobile ski system of claim 1, wherein said plurality of dimples are comprised of a random size.
15. The snowmobile ski system of claim 1, wherein said plurality of dimples are comprised of a random shape.
16. The snowmobile ski system of claim 1, including a keel extending longitudinally from said lower surface, wherein said keel includes a portion of said plurality of dimples.
17. The snowmobile ski system of claim 1, wherein each of said plurality of dimples have a width less than $\frac{5}{8}$ inches.
18. The snowmobile ski system of claim 1, wherein each of said plurality of dimples have a width greater than $\frac{1}{4}$ inches.
19. The snowmobile ski system of claim 1, wherein said plurality of dimples are molded into said lower surface.
20. The snowmobile ski system of claim 1, wherein said plurality of dimples are carved out of said lower surface.

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