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(54) **LONG TRACK MOUNTAIN SNOWMOBILE AND TRACK THEREFOR**

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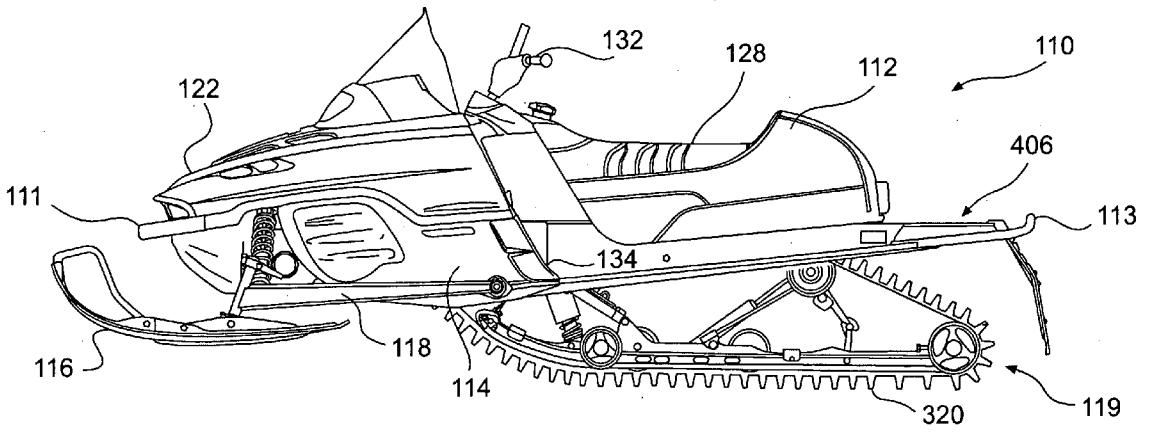
(52) **U.S. Cl.** **180/190**

(57) **ABSTRACT**

A novel mountain snowmobile comprises a frame, an engine disposed on the frame, at least one ski disposed on the frame, a seat disposed on the frame, a steering device disposed on the frame forward of the seat that is operatively connected to the at least one ski for steering the snowmobile, and a novel long length drive track disposed below the frame and connected operatively to the engine for propulsion of the snowmobile. The novel drive track comprises an endless body having a ground-engaging outer surface with a central portion flanked by first and second lateral portions, a plurality of longitudinally spaced reinforcing rods disposed in the body along a transverse direction of the body. The rods define a plurality of pitches, and a plurality of profiles project from the outer surface of the body along the plurality of pitches. A plurality of non-profile regions is defined along the plurality of pitches, and the profiles and profile-free regions define a pattern for each pitch. The pitch pattern for the novel track has a six pitch tread pattern which repeats every successive sixsomes of pitches. A height profile that varies between the first and second lateral portions is defined by the profiles. Such height profile has each profile with a height of not less than about 1¼ inches. The long length track has a length greater than about 141 inches.



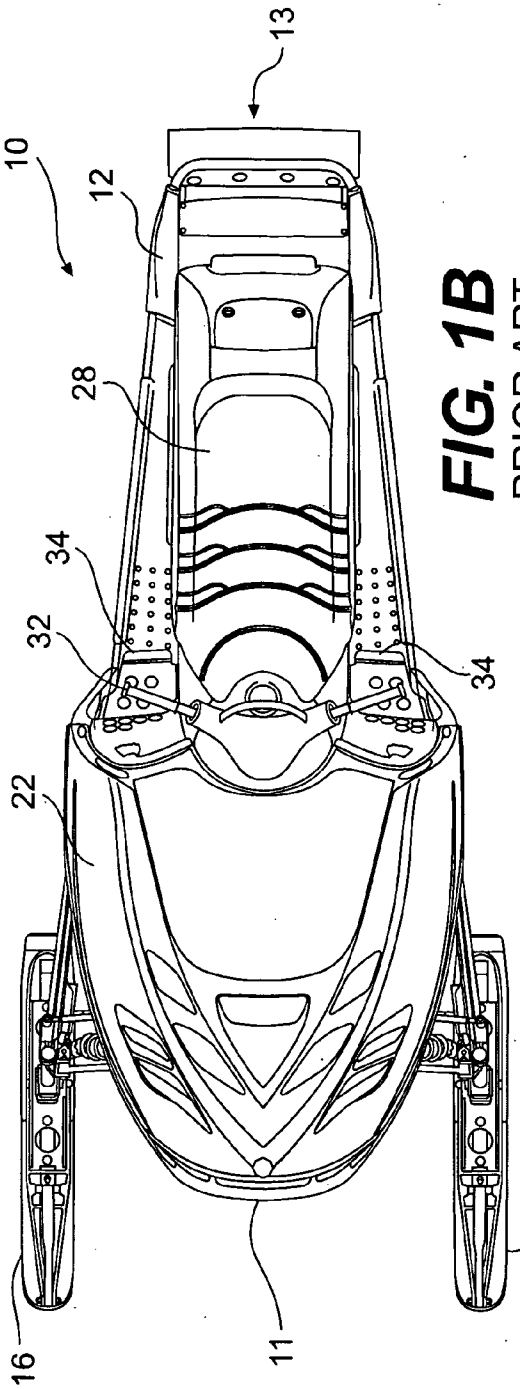


FIG. 1B
PRIOR ART

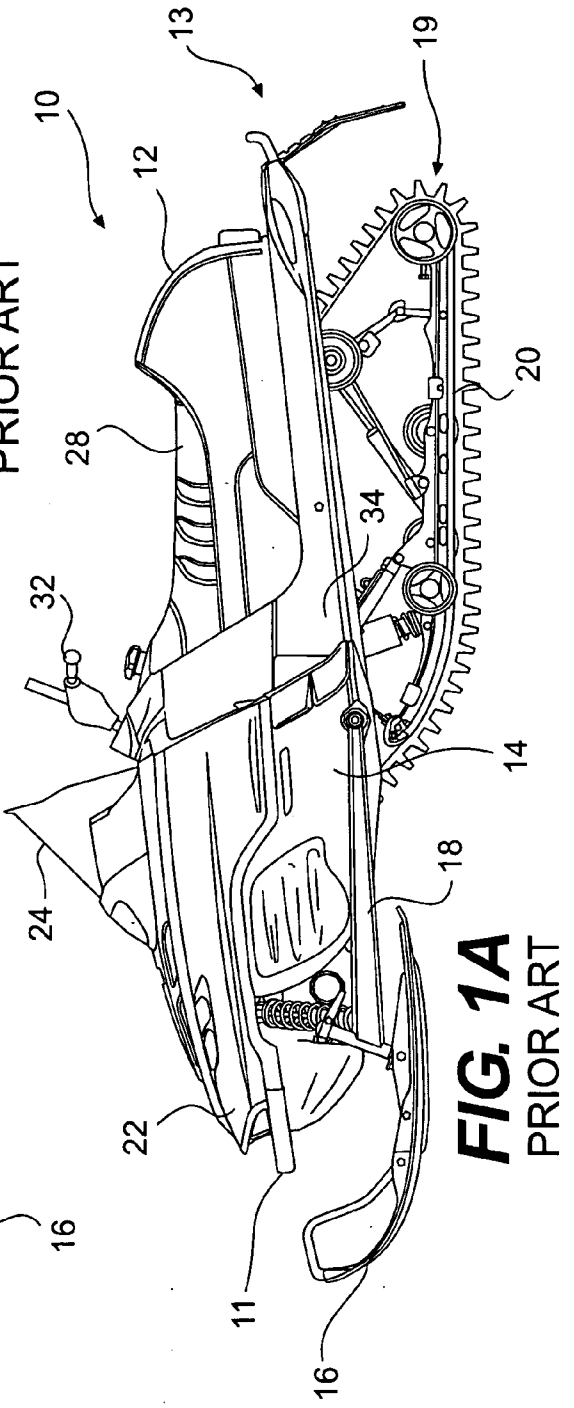


FIG. 1A
PRIOR ART

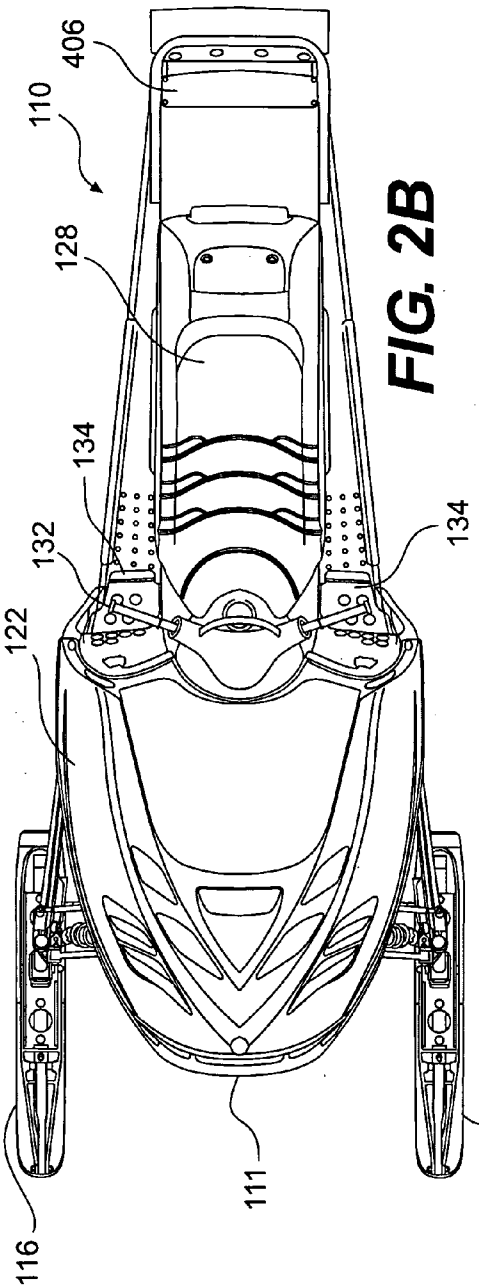
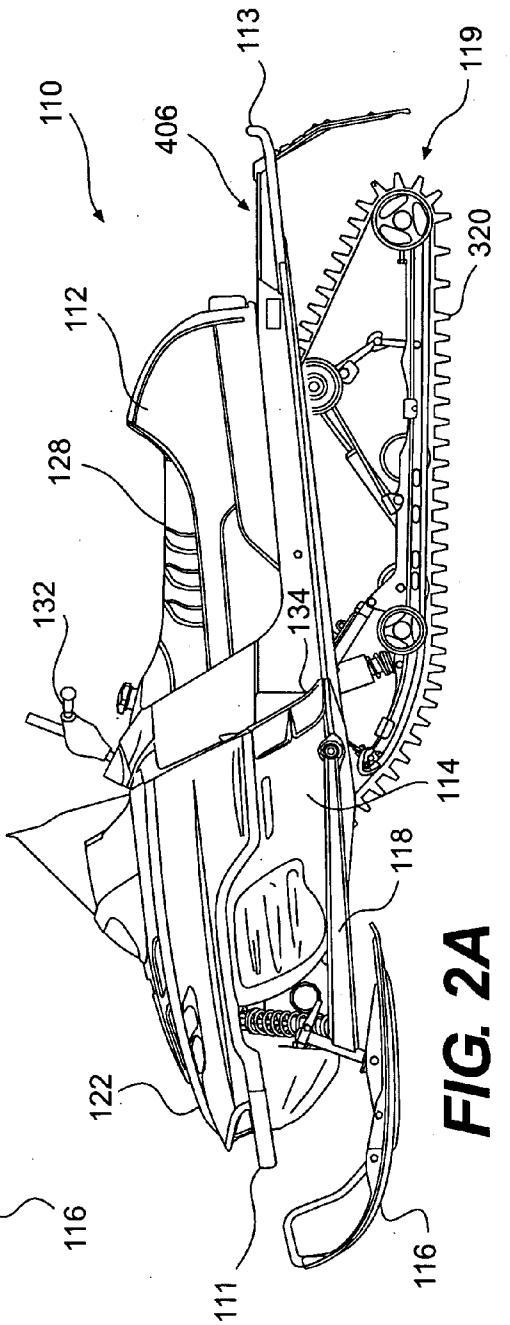

406
110
128
134
132
122
134
116
111

FIG. 2B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406
320
112
128
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134
114
118
122
111
116

FIG. 2A

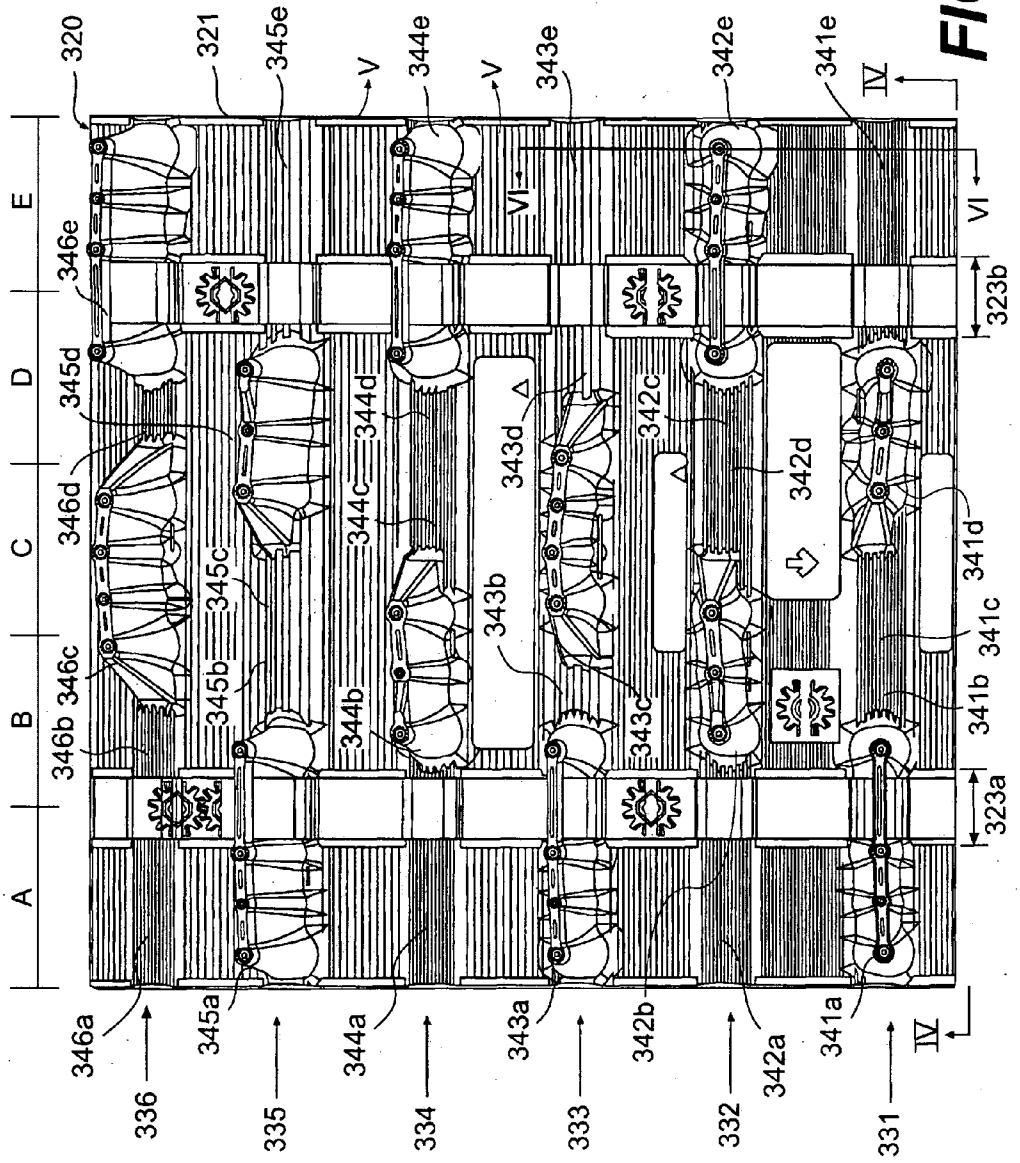

320
321
345e
V
344e
V
343e
342e
341e
IV
VI
VI
323b
346e
345d
346d
345c
344d
344c
343d
342c
342d
341d
346c
345b
344b
343b
343c
341c
341b
346b
323a
A
B
C
D
E
346a
345a
344a
343a
342b
342a
341a
IV
336
335
334
333
332
331

FIG. 3

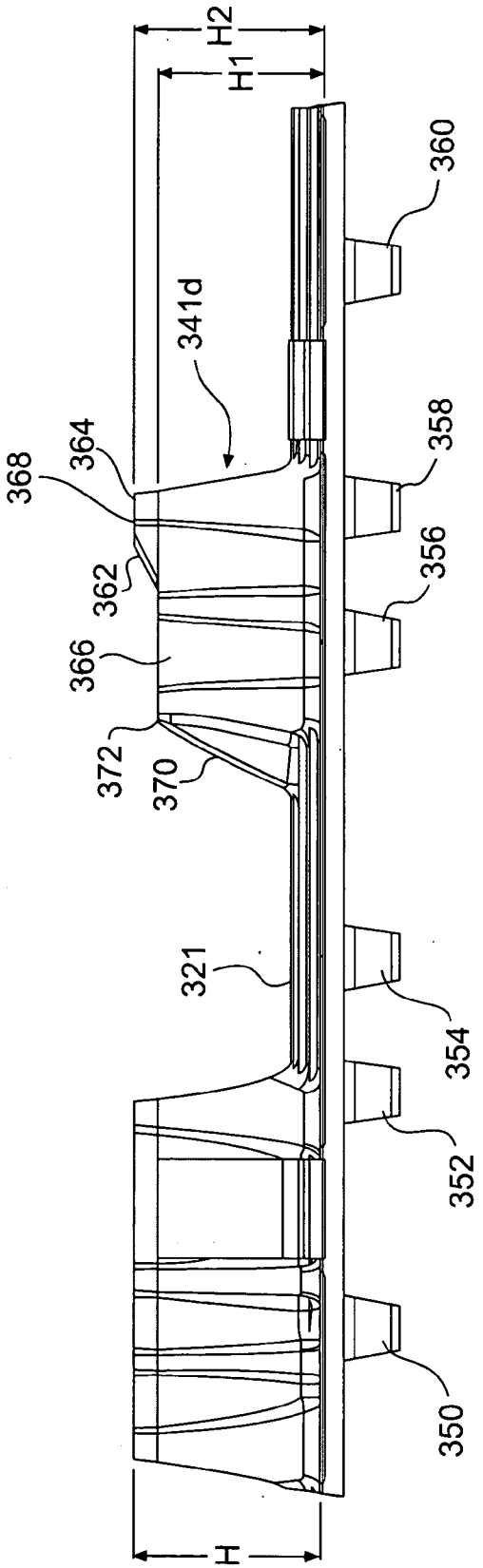


FIG. 4

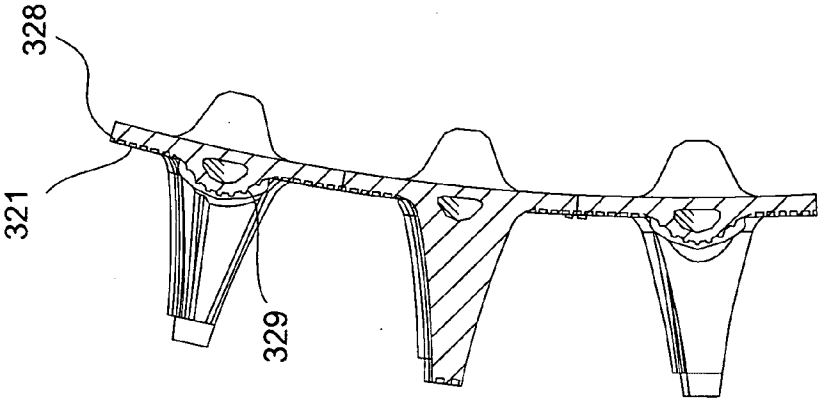


FIG. 6

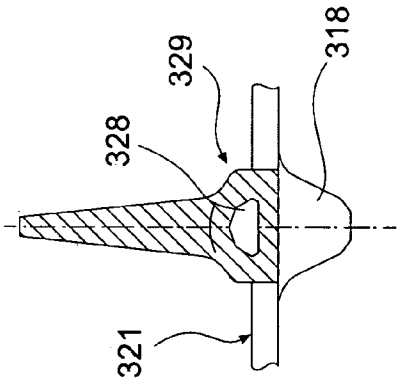


FIG. 5A

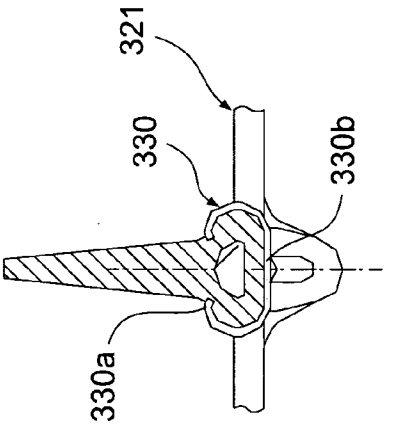


FIG. 5B

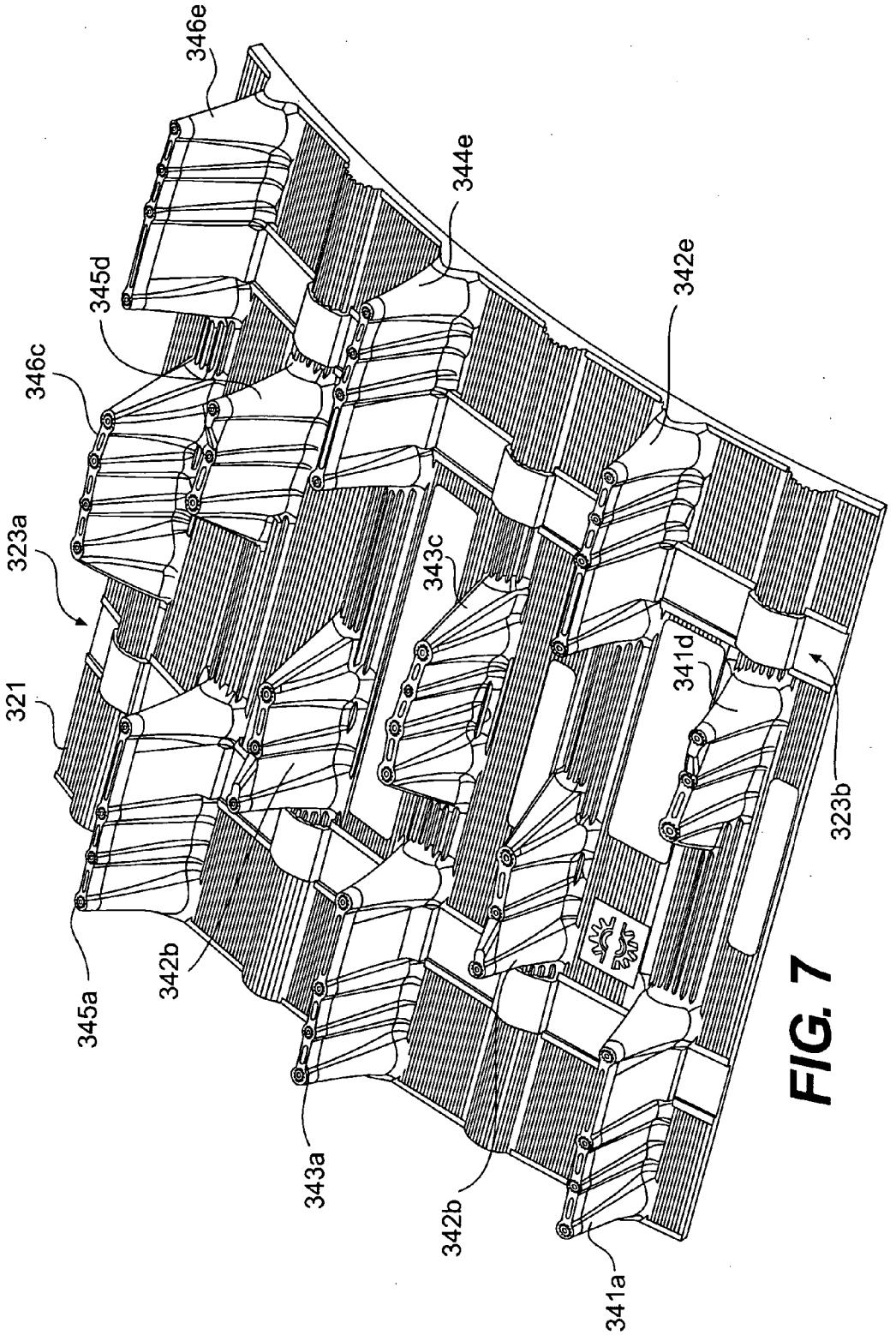
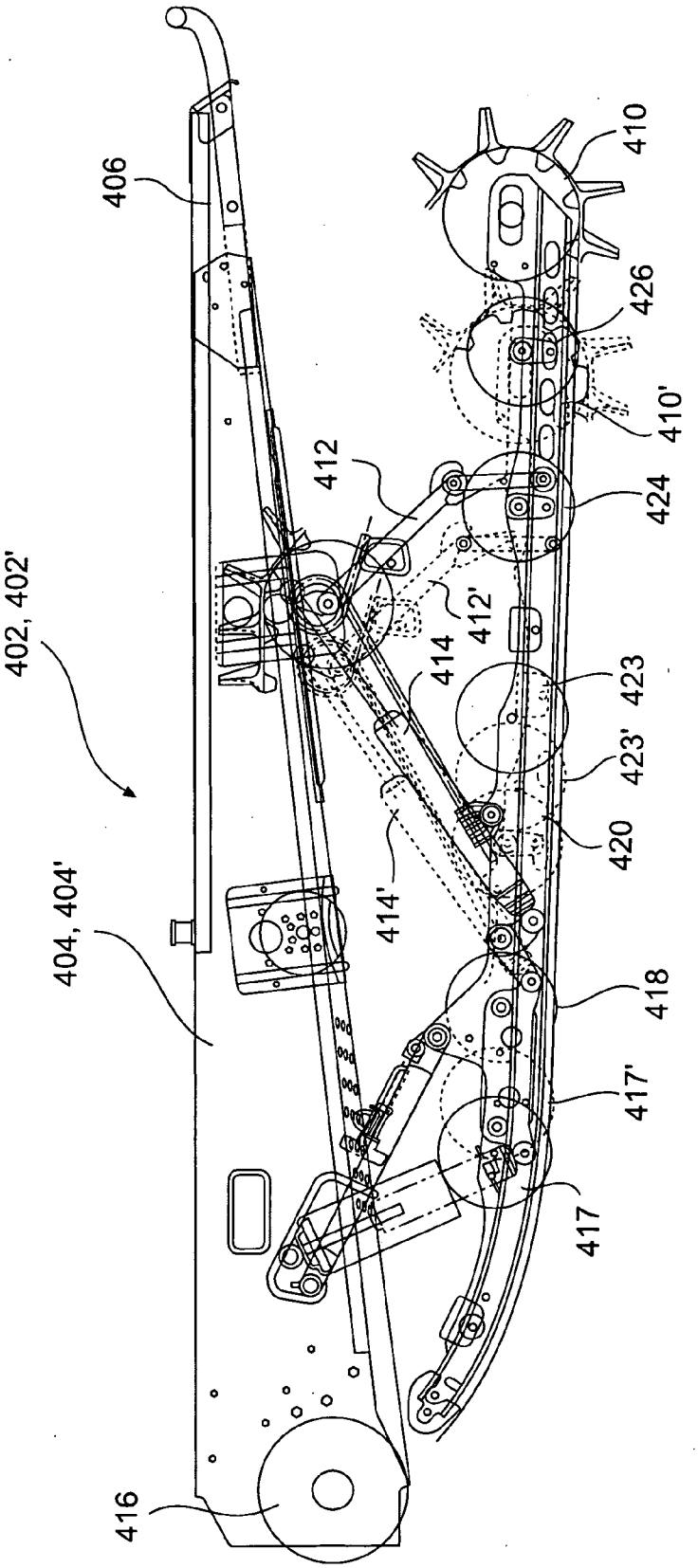

346e
344e
345d
342e
346c
323a
343c
341d
321
323b
345a
342b
343a
342b
341a

FIG. 7


406
410
426
410'
412
424
402, 402'
412'
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423'
414'
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404, 404'
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417'
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FIG. 8

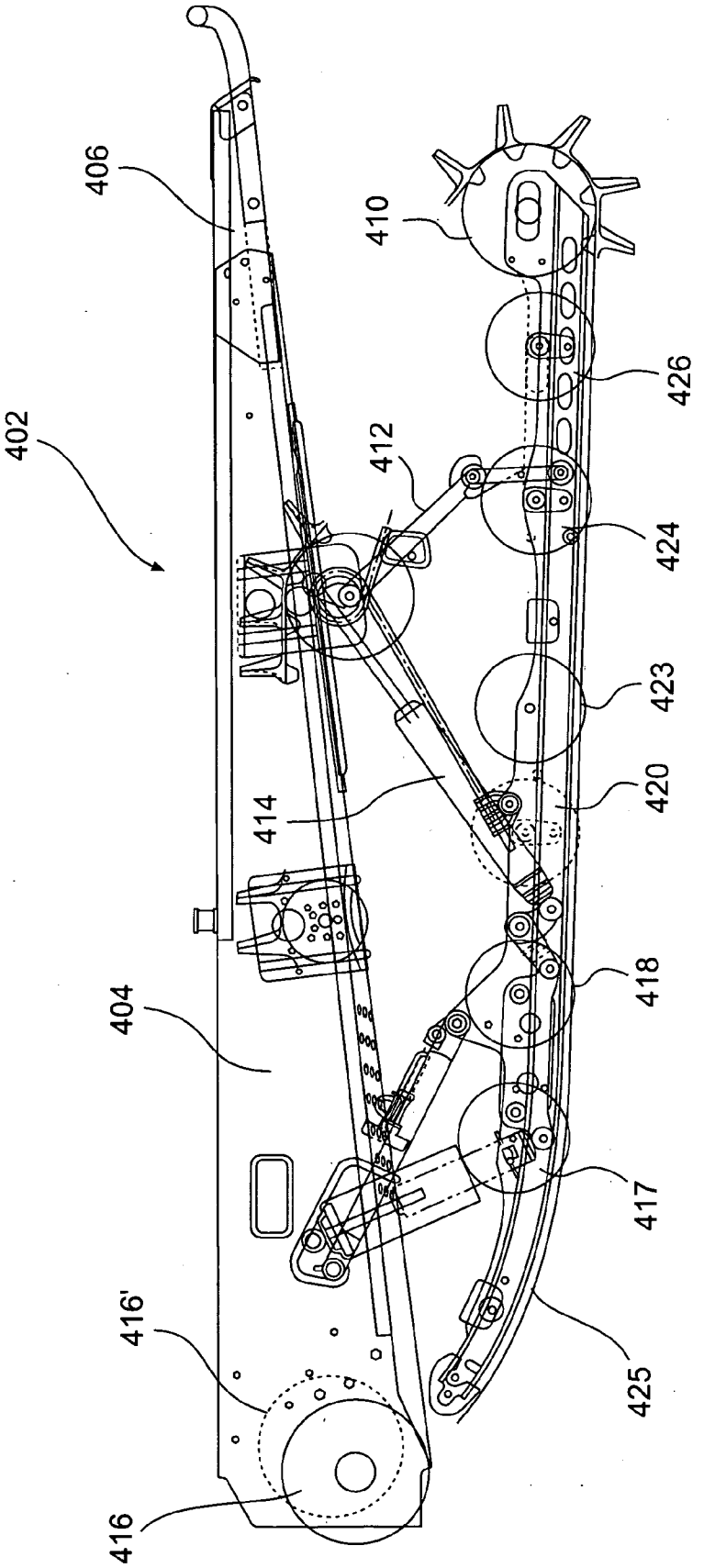

FIG. 9A

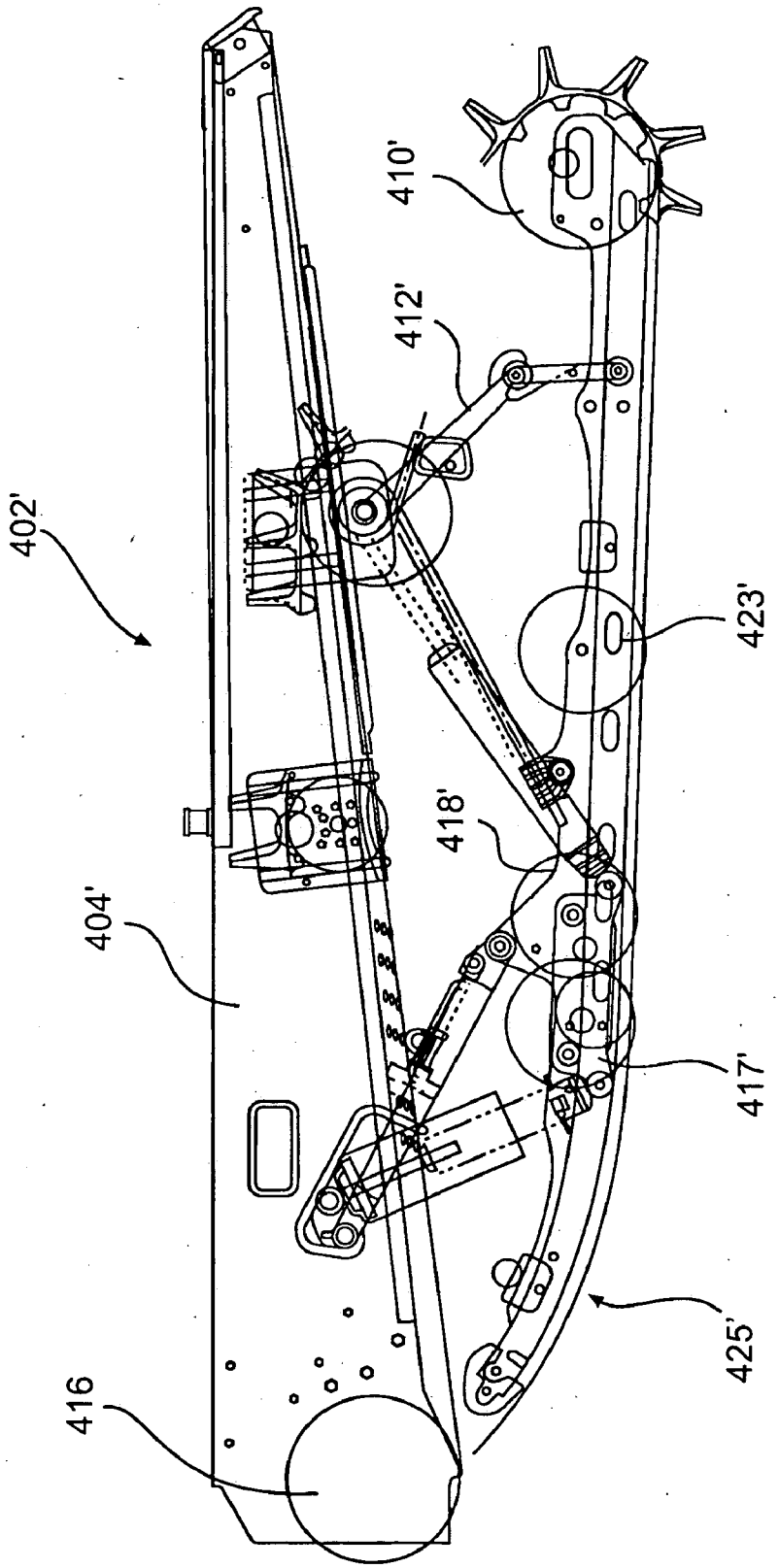

FIG. 9B
PRIOR ART

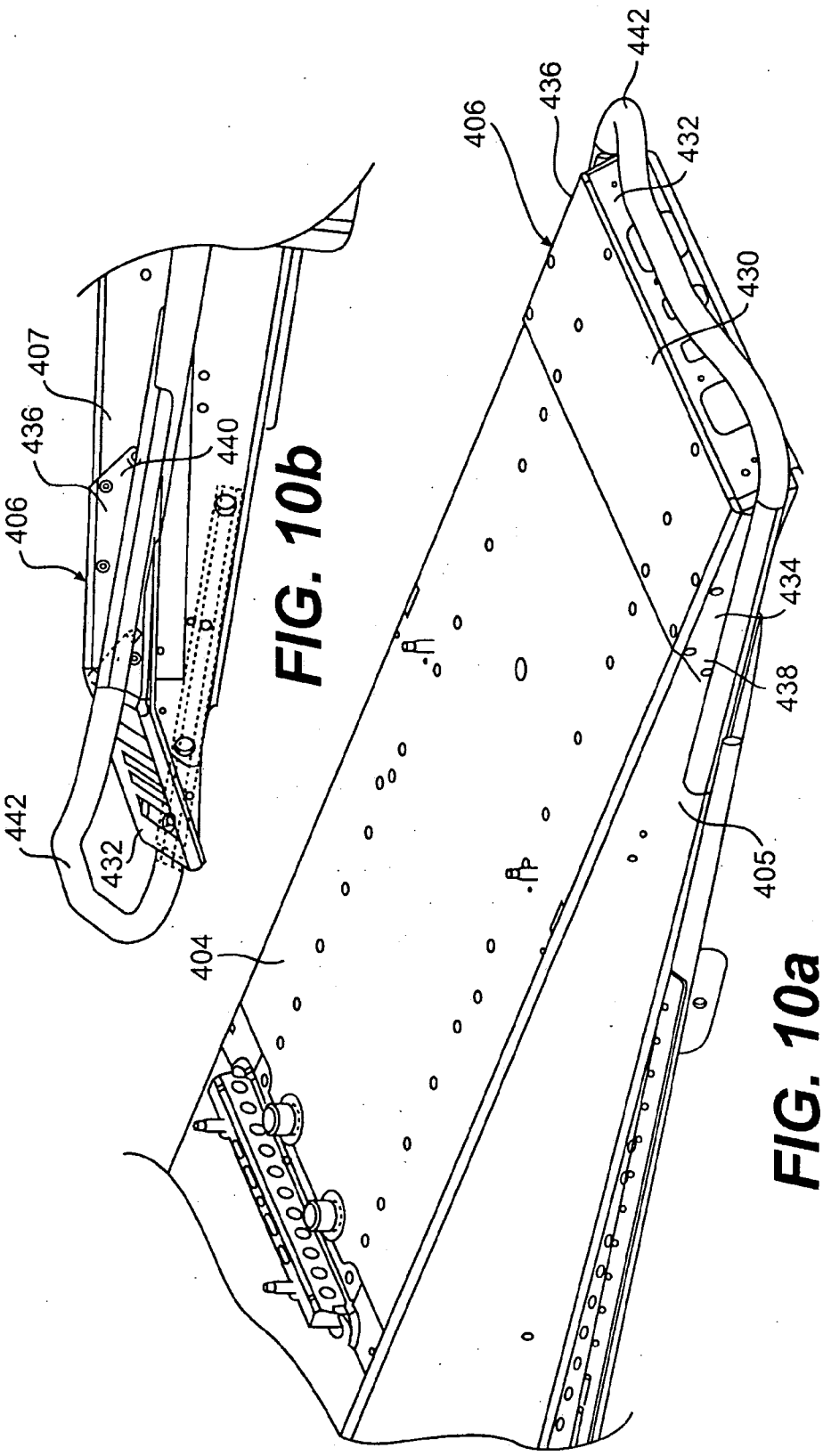
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FIG. 10b
FIG. 10a

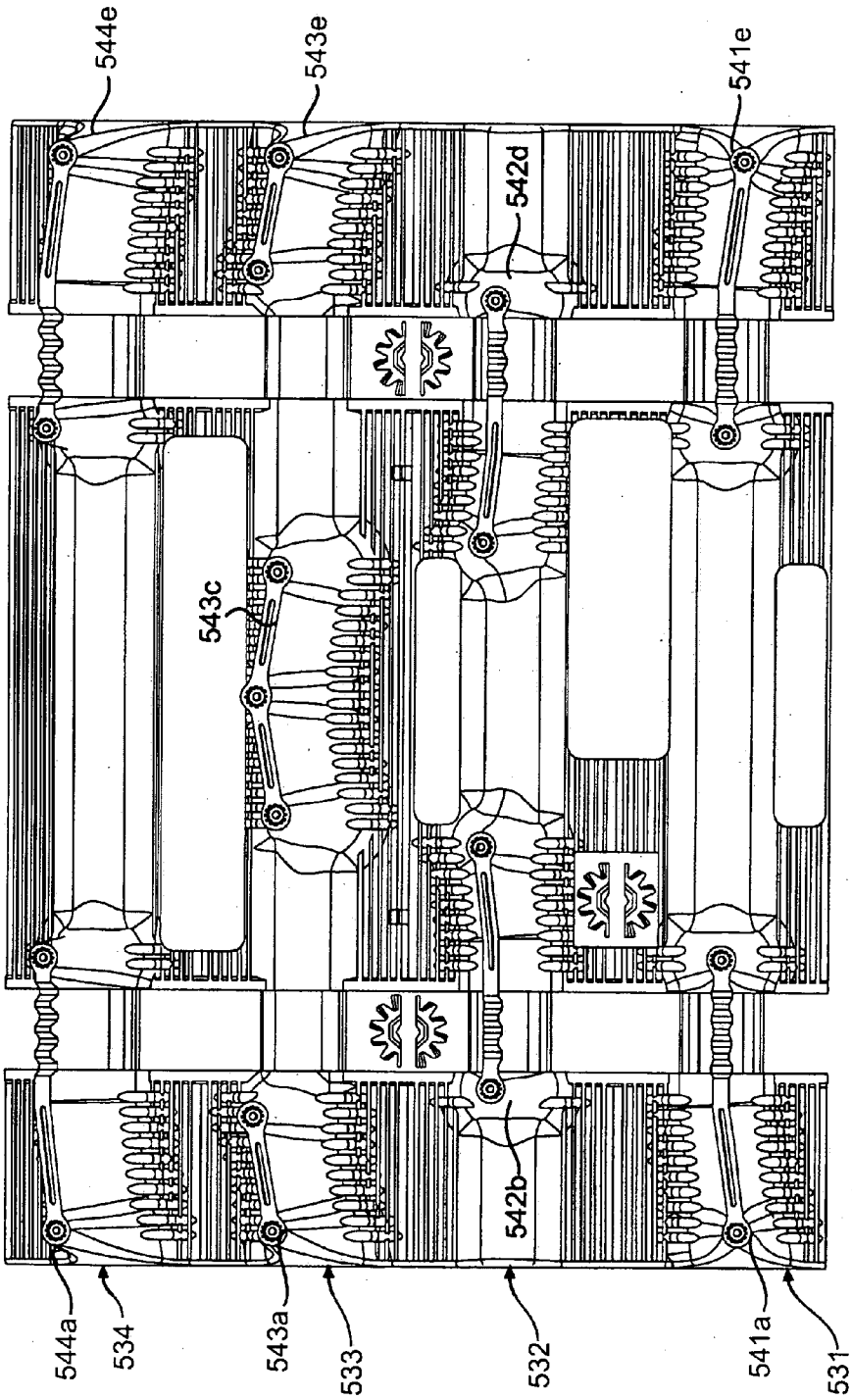

FIG. 11
PRIOR ART

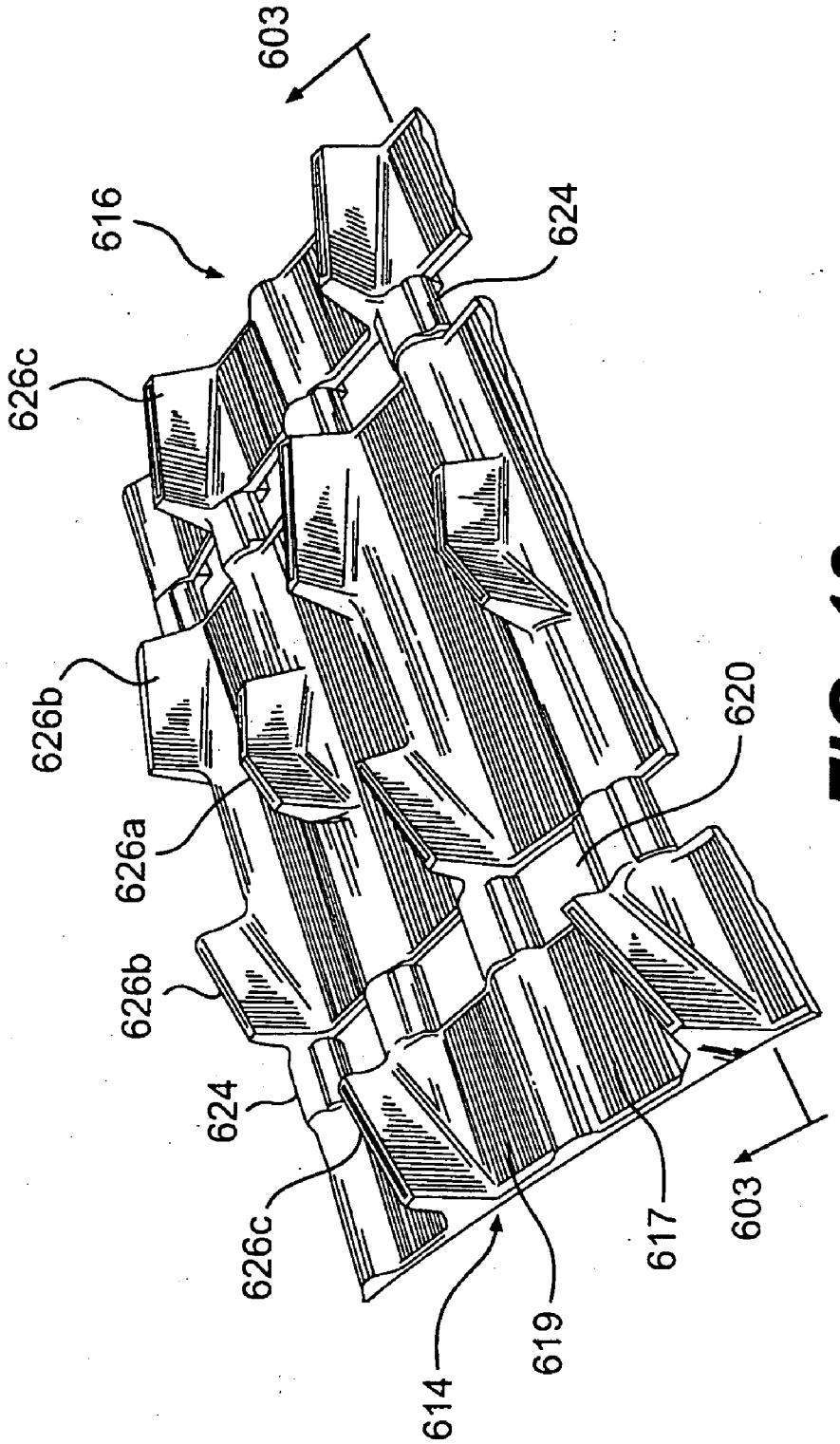

FIG. 12
PRIOR ART

LONG TRACK MOUNTAIN SNOWMOBILE AND TRACK THEREFOR

[0001] This application is a Continuation of U.S. application Ser. No. 10/846,567 filed on May 17, 2004, which is itself a Continuation of U.S. application Ser. No. 10/259,314 filed on Sep. 30, 2002 which is itself a Continuation of U.S. application Ser. No. 09/701,045, filed Nov. 22, 2000, now U.S. Pat. No. 6,510,913. U.S. application Ser. No. 09/701,045 is the national phase of International Application PCT/US00/03401, filed Feb. 11, 2000, which designated the United States. This application also claims priority to U.S. Application 60/181,562, filed Feb. 10, 2000, now abandoned. The entire contents of these applications are herein incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1 . Field of the Invention

[0003] This invention relates to a snowmobile with a long track designed to provide improved traction and smoother ride in light or powder snow. Further, the present invention concerns a new tread pattern of a snowmobile drive track wherein, among others, the track provides superior flotation and traction while maintaining an acceptable degree of maneuverability compared to the conventional track tread patterns in light or powder snow.

[0004] 2. Description of Related Art

[0005] Given the popularity of snowmobiles nowadays, snowmobile manufacturers are offering increasingly diverse choices of snowmobiles adapted for use in different environments. Examples of various categories of snowmobiles include, inter alia, high-performance snowmobiles, touring snowmobiles, utility snowmobiles, and mountain snowmobiles. The mountain snowmobiles, in particular, are designed to meet the unique demands required by the driving conditions in both the mountains and the trails. Such driving conditions include climbing hills, maneuvering sharp turns around trees, and riding on deep powder snow.

[0006] Hill climbing refers to driving a snowmobile up the slopes of the mountains. This task requires that the track of the sled to provide greater traction than as would be provided by the tracks for flatland snowmobiles. More specifically, when climbing hills or sidehilling, the mountain sled is driven in a crisscrossing fashion, substantially upwardly in diagonal directions of the hills, intermittently reversing the lateral direction of the travel. During this operation, the weight of the sled plus the driver is shifted substantially from one lateral side to another, and the sled may be operating substantially leaning on one side. Such sidehilling maneuvers require the snow engaging lugs of both lateral sides of the track to provide substantially more traction than the flatland counterparts. To provide more traction force than the flatland snowmobiles, the mountain snowmobiles typically use longer tracks which have snow engaging lugs with higher heights. Accordingly, where the typical height of the snow engaging lugs for the tracks of flatland snowmobiles is less than about 1 inches, the height of the snow engaging lugs for the mountain snowmobiles is greater than about 1¼ inches, preferably in the range of about 1¾ inches to 2 inches.

[0007] Acceptable maneuverability of the snowmobiles during sharp turns is another key ingredient of a mountain snowmobile. Driving the snowmobiles in the mountains frequently requires making turns, particularly in heavily wooded areas, and the mountain snowmobiles should be designed to maintain the steerability of the sleds. While the increased traction force provided by the tracks with higher heights of the snow engaging lugs and the longer nominal length provides improved traction in hill climbing, such tracks tend to propel or "push" the sleds too much, thereby overwhelming the mountain snowmobile's steerability. One skilled in the art describes this excessive "pushing" as the sled being "too wheely" or having too "much rubber."

[0008] One way the industry has attempted to deal with the concerns over pushing is by providing narrower ski stance for mountain snowmobiles than flatland snowmobiles, since narrowing ski stance generally tends to enhance the steerability of the sleds. Accordingly, a typical mountain sled is equipped with skis whose ski stance is in a range of about 37 inches to 39 inches, compared to the range of about 40 to 43 inches in the typical flatland snowmobiles.

[0009] Finally, flotation refers to the ability of the snowmobiles to stay "afloat" the terrain comprising mainly of fresh powdery snow. In contrast to the flatland trails where there is typically light snow on the ground, in the mountains, there may be hills and terrain which may be covered by as much as 5 to 6 feet of powdery snow. The design of the mountain snowmobiles must provide sufficient flotation on the powder snow as the sled is being driven on such hills and terrain. Typically, the floatability of a snowmobile is a function of many factors that includes the overall weight of the sleds and the overall surface area of the track contacting the snow surface.

[0010] Thus, conventional mountain sleds utilize "regular" tracks. having a length of 136 inches to provide more snow contacting surface in comparison to the flatland sleds which generally favor the use of "short" tracks having a length of 121 inches. One notable exception of a flatland snowmobile having a track length greater than the 121 inch short track length is the utility snowmobile which may have a track longer than 136 inches, 156 inches for example. One of the key differences between a mountain snowmobile and a utility snowmobile, of course, lies in the height of the snow engaging lugs, which is substantially greater in tracks for the mountain sleds.

[0011] Notwithstanding the foregoing, many in the industry, until recently, used to hold the view that apart from the differences in the ski stance and the track length, the mountain snowmobiles are little different from the flatland snowmobiles. In the last few years, however, snowmobile manufacturers have devoted considerable attention to the mountain snowmobiles to satisfy the special requirements for use in the mountains.

[0012] There are several dimensional features of mountain snowmobiles that have been, by in large, constant and unchanging due to the requirements imposed by the specific driving conditions in the mountain applications. One of such dimensions is the aforementioned ski stance which is typically in a range of about 37 inches to 39 inches. Another of such dimensions is the length of the tracks for the mountain snowmobiles, which has been fixed at length of 136 inches. All mountain snowmobile made available by the snowmobile manufacturers heretofore have been made to use tracks having a length of 136 inches and no greater. If the end users

wanted more traction or more snow contracting track surface, they needed to purchase an aftermarket track having a length of 141 inches and install using a bracket kit to accommodate the added length of 5 inches in the track.

[0013] The industry's adherence to a fixed track length of 136 inches reflects the magnitude of its concerns over "pushing." Although greater traction and better flotation may have been achievable by lengthening the track length, those skilled in the art, however, have been reluctant to increase the length of the tracks for the snowmobiles. Many in the industry have been openly skeptical about whether mountain sleds having a track with a longer length than the industry standard 136 inches would properly function in mountain applications which also require an effective, satisfactory maneuverability. Such skepticism seemingly commanded much support from those skilled in the art, particularly in light of the fact that the snow engaging lugs have a height of about 1¼ to 2 inches. Although these gnarly lugs provide the necessary traction force to climb hills or to keep the sled moving in the deep powder snow, they run the risk of providing too great a traction force. The prevalent view in the industry was that the extra snow engaging lugs in combination with the increased track length would produce too much traction force and that the mountain sled would begin to loose steerability to negotiate around turns, because such "long length" tracks would push the mountain sled too much.

[0014] Largely because these concerns over "pushing" and "turning out," one skilled in the art could not and did not change the length of the track, despite potential superior performance of the longer tracks in hill climbing capabilities and flotation. Indeed, such proclivity of the industry is evidenced by the fact that no major commercial manufacturer known to the applicants has made available a mountain snowmobile having a track whose length is greater than 136 inches. Further, even in the aftermarket, no track for mountain snowmobiles has a length greater than 141 inches prior to the present invention.

[0015] In efforts to improve upon the currently available mountain snowmobiles, the inventors desired to provide a track whose length is greater than the standard 136 inches and the 141 inches available in the aftermarket. While many in the industry have remained skeptical about using long tracks in mountain snowmobiles, the inventors determined that one of the avenues which could overcome the challenges of using the long tracks in mountain snowmobiles is to improve the tread patterns of the tracks. In particular, the inventors of the present invention focused on the relationship between the tread patterns and the nominal length of the tracks with respect to traction, maneuverability, and flotation.

[0016] As would be understood by one skilled in the art, a pitch is a traverse row along reinforcing means provided in the track. A particular arrangements of lugs on a pitch is defined herein as a pitch pattern. An arrangement of pitch patterns over a predetermined number of successive pitches is defined herein as a tread pattern, which repeated identically on the track on successive pitches. The arrangement of the tread patterns over the entire longitudinal length of the track is defined as a track pattern.

[0017] Significant research efforts have been devoted to improving and optimizing the characteristics of the tracks for snowmobiles, examples of which include: tread patterns disclosed in U.S. Pat. No. 5,713,645 to Thompson et al., and the tread pattern shown in **FIG. 12**, manufactured by Camoplast Inc. of Sherbrooke, Canada, Track Number 570-2109 and marketed by Bombardier Inc. of Montreal Canada as the track for a snowmobile under the trademark SKI-DOO, model 2000 Summit 700, model year 1999, shown in **FIG. 11**. While these noted examples provide effective traction and control of the snowmobile in many applications, the inventors of the present invention have found that still further improvements can be made in optimizing and improving the performance of the tracks, in particular for tracks for use on light or powder snow.

[0018] With the existing track profile configurations, when the snowmobile is operating on soft or powder snow, when there is increased traction force, the tracks may tend to simply dig a hole in the snow rather than propelling the sled in the driving direction. That is, given the state of the modern day high powered snowmobiles, under certain circumstances, the tracks with the existing track patterns would provide too much traction force vis-a-vis the steerability of the sleds, i.e., "too much rubber." The most clear example of this shortcoming of the existing track configurations is evident when one attempts to use a long length track in a mountain snowmobile with the conventional track pattern.

[0019] As discussed earlier, mountain snowmobiles require the height of the lugs formed on the exterior surface of the track to be at least about 1¼ inches. The current trend is to provide 2-inch or 1¾ inch lugs for tracks for premium quality mountain snowmobiles. At the same time, when the inventors attempted increasing the traction force provided to the snowmobile by lengthening the nominal length of the track from the regular length of 136 inches to 151 inches, the traction force became too large for the snowmobile to maintain its steerability. Thus the requisite maneuverability of the snowmobile necessary in negotiating turns in the mountains was lost.

[0020] Thus, the inventors sought a novel track pattern which can advantageously improve the performance of a snowmobile on powder snow. This novel track would also enable the inventors to provide a mountain snowmobile having a long track whose length is greater than 136 inches, which is what the snowmobile manufacturers use, and also greater than 141 inches, which is what aftermarket track manufacturers make available. In that process, the inventors have further found that the novel track pattern surprisingly provides better track performance not only in the mountain snowmobiles, but also other types of snowmobiles, such as flatland snowmobiles.

SUMMARY OF THE INVENTION

[0021] Therefore, an object of the present invention is to provide a mountain snowmobile with a track having a length of greater than 141 inches. Another object of the present invention to provide a novel track for a snowmobile with improved track performance characteristics, such as traction, control and flotation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] **FIG. 1A** is a side perspective view of a mountain snowmobile in the prior art, manufactured by Bombardier

Inc. of Montreal Canada under the trademark SKI-DOO, model Summit 700, model year 1999;

[0023] **FIG. 1B** is a top view of the mountain mobile shown in **FIG. 1A**;

[0024] **FIG. 2A** is a side perspective view of an embodiment of a snowmobile in accordance with the present invention;

[0025] **FIG. 2B** is a top view of the mountain mobile shown in **FIG. 2A**;

[0026] **FIG. 3** is a top perspective view of a portion of a snowmobile track illustrating a tread pattern in accordance with the present invention;

[0027] **FIG. 4** is a side view of the portion of a snowmobile track illustrated in **FIG. 3**, taken along line IV-IV, viewed in the longitudinal direction of the track, wherein only the first pitch is illustrated;

[0028] **FIG. 5A** is a sectional view of one of the projecting profiles of the portion of a snowmobile track illustrated in **FIG. 3**, taken along line V-V, viewed in the transverse direction of the portion of a track illustrated in **FIG. 3**;

[0029] **FIG. 5B** is a sectional view of an exemplary projecting profile similar to one shown in **FIG. 5A** except that the profile in **FIG. 5B** is provided with a metal clip for engagement with the driving means of the snowmobile.

[0030] **FIG. 6** is a sectioned view of the portion of a snowmobile track illustrated in **FIG. 3**, taken along line VI-VI, viewed in the transverse direction of the track;

[0031] **FIG. 7** is an isometric view of the portion of a snowmobile track illustrated in **FIG. 3**;

[0032] **FIG. 8** is a partially sectioned side view comparing a suspension system, frame, tunnel, and tunnel extension of the mountain snowmobile illustrated in **FIG. 2A** with the a suspension system, frame, and tunnel of the snowmobile illustrated in **FIG. 1A**;

[0033] **FIG. 9A** is a partially sectioned side view comparing a suspension system, frame, tunnel, and tunnel extension of the snowmobile according to the present invention illustrated in **FIG. 2A**;

[0034] **FIG. 9B** is a partially sectioned side view comparing a suspension system, frame and tunnel of a snowmobile in the prior art illustrated in **FIG. 1A**;

[0035] **FIG. 10A** is an isometric view of the tunnel with the tunnel extension in accordance with an aspect of the present invention;

[0036] **FIG. 10B** is another isometric view of the tunnel with the tunnel extension illustrated in **FIG. 10A** viewed from another angle;

[0037] **FIG. 11** is a perspective view of a portion of a snowmobile track bearing a tread pattern in the prior art; and

[0038] **FIG. 12** is a perspective view of a portion of a snowmobile track bearing another tread pattern in the prior art.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0039] Throughout the description of the various embodiments of the present invention, reference will be made to various elements, the construction of which is readily known to those skilled in the art. Accordingly, an exhaustive description of each and every component is not provided, only a description of those elements required for an understanding of the present invention.

[0040] **FIGS. 1A and 1B** illustrate a prior art mountain snowmobile **10** (that sold by Bombardier Inc. of Montreal, Canada, under the trademark SKI-DOO, model Summit 700, model year 1999), which has a forward end **11** and a rearward end **13** (that are defined consistently with the travel direction of the vehicle). The conventional snowmobile **10** includes a body **12** (i.e., the exterior upper portions) and a frame **14**. While not shown in **FIG. 1**, an engine is carried by frame **14** at its forward end. In addition, two skis **16** are attached to the forward end of frame **14** through a front suspension system **18**. A drive track **20** is disposed under frame **14** and is connected operatively to the engine for propulsion of the vehicle about a rear suspension system. The length of the drive track **20** for the conventional mountain snowmobile illustrated in **FIG. 1** is about 136 inches.

[0041] At the front of frame **14**, snowmobile **10** includes fairings **22** that enclose the engine to protect it and to provide a external shell that can be decorated so that the snowmobile is aesthetically pleasing. Typically, the fairings **22** comprise a hood and a bottom pad (neither of which have been individually identified in the Figures). A windshield **24** may be connected to fairings **22** near the forward end **11** of snowmobile **10**. Windshield **24** acts as a windscreen to lessen the force of the air on a rider when snowmobile **10** is moving.

[0042] A seat **28** extends from rearward end **13** of snowmobile **10** to the fairings **22**. A steering device **32**, such as a handlebar, is positioned forward of a rider and behind the engine. Two footrests **34** are positioned on either side of seat **28** to accommodate the rider's feet.

[0043] An embodiment of a snowmobile **110** embodying all aspects of the present invention is illustrated in **FIGS. 2A and 2B**. It should be noted that the snowmobile of **FIGS. 2A and 2B** is an embodiment intended to illustrate all aspects of the present invention and is not provided for the purposes of limiting the scope of the present invention to the snowmobiles having exactly all the components of the snowmobile illustrated in **FIGS. 2A and 2B**. For example, a snowmobile lacking one of the elements of the snowmobile shown in **FIGS. 2A and 2B**, such as the tunnel extension **406** described more fully below, still can be in accordance with another aspect of the present invention, such as the track pattern described more fully below.

[0044] The parts common to the snowmobiles shown in **FIGS. 1A, 1B**, 2A and 2B, have been designated with same reference numerals with the parts belonging to an embodiment of the snowmobile. The parts of the snowmobile in **FIGS. 2A and 2B** different than the parts of the snowmobile in **FIGS. 1A and 1B** are detailed in the following description of the invention, and no other material modifications are contemplated.

[0045] Preferably, the snowmobile shown in **FIGS. 2A and 2B** has a 700 cc engine, and the inventors prefer a cylinder-reed-induction Series 3 Rotax twin engine, traded under the trademark Rotax Engine Type 693 by Bombardier

Inc. of Canada. Further, the platform for the snowmobile shown in **FIGS. 2A and 2B** is preferably a lightweight chassis that provides lower and rearward engine mounting, more preferably a chassis marketed under the trade name of ZX Chassis manufactured by and available from Bombardier Inc. of Canada. The ski stance of the inventors' preferred embodiment is 37 inches.

A. A Mountain Snowmobile With a Long Length Track

[0046] In accordance with an aspect of this invention, a preferred embodiment of a mountain snowmobile illustrated in **FIGS. 2A and 2B** has a track **320** whose length is 151 inches. Previously, available mountain snowmobiles all used a track whose length was no greater than 141 inches, by the virtue of the 136 inch mountain snowmobiles available from the manufacturers and 141 inch track for mountain snowmobiles available in the aftermarket. Thus, the present invention advantageously provides a mountain snowmobile with a track having a length greater than 136 inches as well as greater than 141 inches. Preferably, the mountain snowmobile in accordance with the present invention has a track length of 151 inches. A track length is defined as the circumferential length of the endless body of the track.

[0047] A track for a mountain snowmobile is distinguishable from tracks for snowmobiles of other categories in that the height of the profiles is greater than 1¼ inches, preferably between about 1¼ and 2 inches. More preferably, the height of the profiles is between about 1¾ inches and 2 inches.

[0048] With the increased track length, there is a greater track surface to contact powder snow and thus, the flotation of the snowmobile is greatly enhanced in comparison with the previously available mountain snowmobiles. Further, with the added track length, the mountain snowmobile in accordance with present invention provides greater traction. At the same time, with a unique and novel track design, the present invention provides an acceptable degree of steerability despite increased track length, contrary to the conventional wisdom of many in the industry.

[0049] The preferred embodiment shown in **FIG. 2** has a sixty pitch track. In the prior art, the snowmobile tracks have had 54 pitches for the 136" tracks and 56 pitches for the 141" tracks. The 151" track of the preferred embodiment of the present invention accommodates sixty pitches. A sixty pitch track can advantageously accommodate 10 six-pitch tread patterns, 15 four pitch tread patters, 20 three-pitch tread patterns, or 30 dual pitch tread patterns—thus any multiples of the traditional, the dual, or three-pitch tread patterns. In the preferred embodiment, a six-pitch tread pattern is used to optimize the track performance characteristics, as discussed more fully later. Because sixty pitches can accommodate multiples of both dual and three-pitch tread patterns, the 151 inch track of the preferred embodiment offers more flexibility in the track design than the 141 or 144 inch tracks. Further, because the width of the tracks for mountain snowmobiles is typically 15 inches, the 151 inch track can also be expressed as having a nominal length to a nominal width ratio of about 10.067, whereas the conventional 136 inch track has the length to width ratio of about 9.067 and the 141 inch track has the length to width ratio of about 9.400.

[0050] Although the preferred embodiment provides a mountain snowmobile having a sixty pitch track or a 151 inch track length, it is emphasized that the present invention is not limited thereto. For example, the invention should be broadly construed to include tracks for mountain snowmobile applications, (i.e. having a lug height of greater than 1¼ inches), having a track length greater than the conventional 136 or 141 inches, specifically including the 144 inch tracks. The 141 inch track is a 56 pitch track with the length to width ratio of about 9.40. The 144 inch track is a 57 pitch track with the length to width ratio of about 9.60. The principles of the present invention in providing a mountain snowmobile with a 151 inch track can be applied to mountain sleds with tracks with lengths greater than 141 inches including 144 inches.

[0051] It should be further noted that 136 inches, 141 inches, 144 inches and 151 inches in describing the track length are not absolute exact measurement, but rather there are negligible deviations in the measurements. For example, the 151 inch track is actually closer to 151.2 inches.

B. Track Profile

[0052] In **FIG. 3**, a portion of the track illustrated in **FIG. 2A** is illustrated. The track **320** is fabricated as a molding of fabric reinforced natural or synthetic rubber. The track is made from ply rubber in the preferred embodiment. Embedded in the molded rubber body **321** is a plurality of disposed reinforcing rods **328** (see **FIG. 5A**), each of which extend transversely substantially covering the entire width of the track. As illustrated in **FIG. 4**, the embedded reinforcing rods **328** are embedded in the body with a regular spacing in longitudinally extending rows. In the preferred embodiment, between two successive longitudinally extending rows is about 2.52 inches. Each horizontally extending reinforcing rod embedded area defines a pitch.

[0053] **FIGS. 5A and 5B** illustrate how the reinforcing rod **328** is embedded in relation to the projecting profile **344***e* and the inner lug **318**, the relationship between which is conventional and well known in the art. By virtue of its construction, the rubber body **321** is flexible in its longitudinal direction, and it is stiffened in the transverse direction by the series of regularly spaced reinforcing rods **328** that extend along substantially the entire width of the track, preferably extending along the entire width of the track. The thickness of the track is locally increased in the region of the reinforcing rod embedded area **329** as is evident in **FIGS. 5A, 5B** and **6**. The track body **321** has two longitudinally extending areas corresponding to the sprocket engaging areas **323***a*, **323***b* of the track, as shown in **FIGS. 3 and 7**. On every third pitch, the reinforcing rod receiving areas **329** along the sprocket engaging areas **323***a*, **323***b* are preferably reinforced by metal clips **330** of generally C-shaped profile. The ends **330***a* of the metal clips **330** are clinched into the outer side of the track whereas the central portion **330***b* lie flat against the interior side of the track body **321** and form bearing means for engagement with the slide rails of the slide suspension, as is well understood in the art.

[0054] The outer side of the tracks has a pattern of projecting lugs, integrally formed thereon. The lugs are also referred to as profiles, paddles or ribs, and therefore, these terms will be used interchangeably hereinafter in this application. The profiles are made of fabric reinforced natural or synthetic rubber. The durometer of the compound for the outside cover of the track body **321** may range between

about 60° and 80°. The durometer for the compound for the inside cover of the track body **321** and the lugs is about 80 durometer.

[**0055**] The profiles are discussed in further detail with reference to **FIG. 3**. In general, however, the profiles are provided on the reinforcing rod embedded areas **329** defined on the endless body **321**. The presence and absence of the profiles along the transverse direction of a pitch define a pitch pattern for that pitch. The profile pattern formed by a particular arrangement of successive pitch patterns that repeats identically on over the successive pitches defines a tread pattern. The tread pattern is repeated identically on successive pitches on the endless track body. The repeated tread patterns in the successive pitches along the substantial length of the track defines the track profile pattern, also referred to as track pattern herein.

[**0056**] Conventionally, tread patterns based on two pitches or three-pitches have been used in the tracks for snowmobiles. A tread pattern formed based on the repetition of the pitch patterns of two successive pitches is called a dual pitch tread. pattern. A tread pattern formed based on the repetition of the pitch patterns of three successive pitches is called a three-pitch tread pattern. For clarification, it is noted that the tread pattern is characterized and defined by the lowest number of the successive pitches comprising the pattern which repeats itself. For example, it can be argued that a set of twelve successive pitches, which is formed by four sets of the three-pitch tread patterns, has a six-pitch tread pattern. Such argument would be contrary to the definition herein. Because the lowest number of successive pitches forming a pattern which repeated itself on successive pitches is three, the proper characterization of the tread pattern in this example is a three-pitch tread pattern, and not a six-pitch tread pattern. The definition of tread pattern provided and illustrated herein shall be applicable to the appended claims also.

[**0057**] The preferred embodiment illustrated in **FIG. 3** has a six-pitch tread pattern, i.e., a tread pattern formed based on the repetition of the pitch patterns of six successive pitches. To facilitate the discussion of the preferred embodiment illustrated in **FIG. 3**, it is helpful to describe the locations of the profiles along the longitudinal and transverse directions of the track **320**. Along the longitudinal direction of the track **320**, there are illustrated six-pitches: a first pitch **331**, a second pitch **332**, a third pitch **333**, a fourth pitch **334**, a fifth pitch **335**, and a sixth pitch **336**. Along the transverse direction of the track **320**, the track **320** is divided roughly into five lateral portions for discussion purposes: a left outer lateral portion A, a left inner lateral portion B, a central portion C, a right inner lateral portion D, and a right outer lateral portion E. Thus, in the six-pitch tread pattern illustrated in **FIG. 3** comprises the following profiles:

[**0058**] the first pitch **331** has profiles **341***a* and **341***d;*

[**0059**] the second pitch **332** has profiles **342***b* and **342***e;*

[**0060**] the third pitch **333** has profiles **343***a* and **343***c;*

[**0061**] the fourth pitch **334** has profiles **344***b* and **344***e;*

[**0062**] the fifth pitch **335** has profiles **345***a* and **345***d*; and

[**0063**] the six-pitch **336** has profiles **346***c* and **346***e*.

Likewise, the profile-free regions can be designated as follows:

[**0064**] the first pitch **331** has profile-free regions **341***b*, **341***c* and **341***e;*

[**0065**] the second pitch **332** has profile-free regions **342***a*, **342***c* and **342***d;*

[**0066**] the third pitch **333** has profile-free regions **343***b*, **343***d* and **343***e;*

[**0067**] the fourth pitch **334** has profile-free regions **344***a*, **344***c* and **344***d;*

[**0068**] the fifth pitch **335** has profile-free regions **345***b*, **345***c* and **345***e*; and

[**0069**] the six-pitch **336** has profile-free regions **346***a*, **346***b* and **346***d*.

[**0070**] It should be understood from **FIG. 3** that the numerical designation is for discussion purposes only. Having common designation of the location along the traverse direction of the track does not indicate that they are identical in shape and the precise location. For example, the shapes and the locations of the profile **343***c* and the profile **346***c* along the longitudinal direction are not exactly the same although they are both designated as being disposed in the central portion C. Further, it is worth stressing in the beginning of the discussion of the tread pattern shown in **FIG. 3** that the tread pattern shown in the **FIGS. 3-7** is meant to be illustrative of the inventive concepts of the present invention, and not to limit the scope of the invention by providing a detailed description of the preferred embodiment of the inventors. For example, the locations, shapes and the number of the profiles on each pitch can be varied easily without departing from the spirit of the present invention.

[**0071**] The following observations are made regarding the tread pattern and the profiles illustrated in **FIGS. 3 and 7**:

[**0072**] 1. There is no "open window," defined and discussed below, extending in the longitudinal direction. In other words, when a tread pattern is viewed in the longitudinal direction, (as is seen in **FIG. 4**), no profile-free area extends all the way to the next tread pattern. Thus, there is no profile free area along the entire width of the track;

[**0073**] 2. The paddles or lugs on the outer lateral portions A and E of the track are provided in a "staggered" relationship in the longitudinal direction, wherein only one paddle is provided every other pitch on each of the outer lateral portions A and E.

[**0074**] 3. The thread pattern of the track illustrated in **FIG. 3** is a six-pitch pattern, which is the inventors' preferred tread pattern in the preferred sixty-pitch track;

[**0075**] 4. The profiles along the width of the track have different heights, such as in the preferred embodiment which shows that the height of the portions of the profiles just inside of the two sprocket engaging areas **323***a* and **323***b* is lower than the height of the portions of the profiles outside of the two sprocket engaging areas **323***a* and **323***b;*

[0076] 5. Each of the profiles immediately adjacent to and inside the sprocket engaging areas **323***a* and **323***b* have two portions have a different height than the others and are disposed with a slanted step-down area therebetween. For example, as shown in **FIG. 4**, the profile **341***d* has a higher portion **364** and a lower portion **366** with a slanted step-down area **362**. The higher portion **364** has a height of preferably 2 inches, and the lower portion **366** has a height of preferably 1¾ inches. There is provided a tower portion **368** in the higher portion **364** immediately before the step-down area **362**. At the lateral ends of some profiles, there are provided slopes extending from the track body surface to the upper edge surface of the profiles. For example, the profile **341***d* has a slope **370** extending from the upper edge surface **372** of the profile **341***d* down to the track body surface **321**; and

[0077] 6. The profiles in the central portion C of the track are provided every third pitch, and are slightly offset from the center.

The above list of observations is not an exhaustive list and therefore should not be viewed as excluding other features of the present invention illustrated in **FIGS. 3, 4** and **7**.

[0078] We discuss the above noted observations with respect to various aspects of the present invention in turn. First, although there are profile-free regions in each pitch, there is no continuous line of profile-free areas in the longitudinal direction of the track. As would be **10** appreciated by one skilled in the art, it is desirable that absent a compelling reason, paddles within a tread pattern leave no profile-free regions along the entire width of the track. If such an "open window" in the track exists when viewed in the longitudinal direction of the track, the snow is not cleared from under the track by any of the profiles. The snow left along the track line lifts the aft end of the snowmobile, creating a bobbing action, and ultimately an unstable rough ride of the snowmobile.

[0079] Thus, viewed in the longitudinal direction, a plurality of profiles along the pitches of the track should completely cover the transverse width of the track. For example, in **FIG. 3**, in a view taken from line IV-IV, any portions of the first pitch **331** that are the profile-free regions **341***b* and **341***e* have profile in other pitches further down in the longitudinal direction, the profile **342***b*. **342***e* for example. In the preferred embodiment, an entire width of the track is covered in the transverse direction by the profiles from at most three successive pitches. In the example above, all areas of the profile-free regions **341***b* and **341***e* of the first pitch **331** are compensated with the profiles **342***b* and **342***e* from the second pitch **332**. In another example from **FIG. 3**, all areas of the profile free regions **342***a* and **342***d* of the second pitch **332** are compensated by the profiles **343***a* and **343***c* of the third pitch **333** and the profile **345***d* of the fourth pitch **334**.

[0080] In another aspect of the present invention, every profile in one pitch in the outer lateral portions A and E is followed by a profile-free region in the very next pitch in the longitudinal direction. Thus, there is one profile every other pitch along the longitudinal direction in the outer lateral portions A and E of the track. This is defined herein as a staggered relationship. For example, the profile **341***a* in the first pitch **331** is followed by the profile-free region **342***a* in the second pitch **332**, which is in turn followed by the profile **343***a* in the third pitch **333**. Likewise, the profile-free region **341***e* in the first pitch **331** is followed by the profile **342***e* in the second pitch **332**, which is in turn followed by the profile-free region **343***e* in the third pitch **333**. This one profile every other pitch along the outer lateral portions of the track is repeatedly preferably throughout the track.

[0081] The one profile per every other pitch arrangement in the longitudinal direction advantageously provides a better distribution of load per profile, in comparison with a tread pattern which places profiles in successive pitches in the longitudinal direction. For example, in the tread pattern shown in **FIG. 11**, there are substantially overlapping profiles in the longitudinal direction. For example, about 50% of the profile **541***a* of the first pitch **531** is overlapped in the longitudinal direction by the profile **542***b* of the second pitch **532**. As another example, 100% of the profiles **543***a* and **543***e* in the third pitch **533** of the tread pattern shown in **FIG. 11**, are in line with, and therefore overlap, the profiles **544***a* and **544***e* of the fourth pitch **534**.

[0082] When two paddles are provided in successive pitches along the longitudinal direction, the second of the paddle becomes "unloaded" because there is less snow for it to grip. In such case, the load on the second paddle located right after the first paddle in the longitudinal direction is substantially less than the first paddle in the tracking direction. Hence, there is a inefficiency associated with the latter paddle placed in a consecutive sequence. Had the second paddle been provided more snow to engage, it would have contributed more to the traction provided by the track.

[0083] In contrast, when only one profile is provided in every other pitch in the longitudinal direction, the load on the two paddles, spaced apart by two pitches, tends to be substantially equal, thereby resulting in more balanced loads per paddle. Further, because each paddle is allowed to grip more evenly distributed snow, more traction force can be generated. Thus, by wasting less of the track driving force, the present invention advantageously provides better traction force.

[0084] For the mountain snowmobiles, the sled often performs "sidehilling," during which the sled climbs a hill by making a plurality of diagonally upward zigzag moves. During sidehilling, one lateral side of the track contacts more of the snow surface than the other due to the angle of the sled's contact with the sidehill and the consequent weight transfer. Therefore, the profiles on the lateral ends in the transverse direction of the track are relied upon more heavily to provide traction. Obviously, any loss of traction abilities in the lateral portions should be avoided. The tread pattern illustrated in **FIG. 3** in accordance with the present invention advantageously allows the profiles placed in the staggered relationship between pitches on the side portions of the tracks to perform betterby providing more traction.

[0085] In another aspect of the present invention, the tread pattern shown in **FIG. 3** is a six-pitch tread pattern. The tread patterns available heretofore were either a three-pitch tread pattern or a dual pitch tread pattern. In the three-pitch tread pattern, three pitches define the tread pattern to be repeated identically on successive threesomes of pitches substantially throughout the length of the track, as shown in **FIG. 11**. In the dual pitch tread pattern, two pitches define

the tread pattern to be repeated identically on successive twosomes of pitches substantially throughout the length of the track, as shown in **FIG. 12**. In contrast, the tread pattern of the present invention illustrated in **FIG. 3** provides a six-pitch pattern, which repeats identically on successive sixsomes of pitches.

[**0086**] The track **320** of the preferred embodiment has sixty pitches and a track length of 151 inches. Although the inventors prefer the number of pitches in the track be a multiple of six, e.g., 60 pitches, the present invention is not limited thereto. For example, because the inventive aspects of the six-pitch track pattern illustrated in **FIG. 3** provide what the inventors believe is optimum track performance for the requirements of mountain snowmobiling, one could even use multiples of six-pitches as much as possible and fill in the remaining pitches with any pitch patterns of the tread pattern. For example, if one were to opt for a track for mountain snowmobile having a length of 144 inches and 57 pitches, one can provide nine repetitions of the six-pitch tread patterns and provide the pitch patterns of the first three pitch patterns, e.g. pitch patterns of **331**, **332**, and **333**.

[**0087**] The six-pitch tread pattern in accordance with the present invention is advantageous over the three-pitch pattern because the three-pitch pattern cannot accommodate the one paddle every other pitch in the longitudinal direction arrangement discussed above. If a tread pattern repeats after every three-pitches, there will be at least one pair of paddles per the three successive pitches that is lined up consecutively in the longitudinal direction, given design parameters of snowmobile tracks. The present invention, however, is able to accommodate the one paddle per every other pitch in the longitudinal direction arrangement as shown in **FIG. 3**.

[**0088**] Dual pitch tread patterns, on the other hand, can accommodate the one paddle per every other pitch in the longitudinal direction arrangement. However, the dual pitch tread patterns have inferior weight distribution than three-pitch tread patterns and the six-pitch tread pattern of the present invention. In short, the percentage of the weight of the profiles in each of the first and the second pitches are roughly 50% in the dual pitch tread pattern. The three-pitch tread pattern, on the other hand, can reduce the weight per profiles in each of the three-pitches to about 33%. Thus, the weight of the sled can be reduced substantially since the lug weight typically comprises about 75% of the total weight of the track. One skilled in the art would appreciate that it is highly desirable to make the snowmobile as light as possible within given design parameters.

[**0089**] This aspect is best explained by analyzing the weight of the paddles in any given three successive pitches. As mentioned earlier, an effective and efficient tread pattern design leaves no profile-free area over the entire transverse width of the track when viewed in the longitudinal direction. In the dual pitch tread pattern, the profiles over two pitches must provide the coverage for the entire transverse width of the track. In contrast, the three-pitch tread pattern has, by definition, three-pitches to provide enough profiles to cover the entire transverse width of the track. The optimum weight of the paddles required to cover the entire width of the track is the same, whether the paddles are in a two pitch tread pattern or in a three-pitch tread pattern, because the entire transverse width of a track can be covered using what would be equivalents to paddles that are all placed in one pitch.

[**0090**] For the purposes of comparison, the weight of the paddles necessary to cover the entire width of the track is assumed as 1.00 kg. It is further assumed that the profiles of the dual pitch pattern and the three-pitch pattern have been optimally arranged. Thus, in the dual pitch pattern, the entire width of the track is covered by the paddles over two pitches, collective weighing 1.00 kg. In the three-pitch pattern, the entire width of the track is covered by the paddles over three-pitches, collective weighing 1.00 kg. Therefore, when the weight of the optimally disposed paddles per pitch is calculated, the weight of the optimally disposed paddles per pitch in the dual pitch tread pattern is 0.50 kg, while the weight of the optimally disposed paddles per pitch in the three-pitch tread pattern is 0.33 kg. Thus, when comparing the weight of the optimally disposed paddles in the dual pitch tread pattern over the same number of pitches with the weight of the optimally disposed paddles per pitch in the three-pitch tread pattern, the weight of the paddles in the dual pitch pattern is 50% greater than that of the three-pitch system. For example, over the three-pitches, the weight of the optimally disposed paddles per pitch in the two-pitch tread pattern is 1.50 kg. In the three-pitch tread pattern, the weight of the optimally disposed paddles per pitch in the three-pitch tread pattern is 1.00 kg. Thus, the weight of the paddles in a track using optimally designed three-pitch pattern is ⅔ of the weight of the paddles in a track using optimally designed two-pitch pattern. One skilled in the art readily agree that the three-pitch tread pattern achieves better weight distribution than two-pitch tread patterns.

[**0091**] Returning to the six-pitch track profile of the present invention illustrated in **FIG. 3**, the tread pattern can be viewed as two three-pitch patterns whose second three-pitch pattern is an inverted image of the first. Thus, the advantages of the three-pitch patterns over the two-pitch pattern discussed above are equally applicable to the six-pitch tread pattern illustrated in **FIG. 3**. Further, the six-pitch pattern shown in **FIG. 3** is more preferable to the three-pitch pattern because it allows the one paddle per every other pitch "staggered" relationship on the outer lateral portions of the track. The six-pitch tread pattern of the present invention is also preferable to the dual pitch tread patterns since it can achieve better weight distribution. In fact, quite surprisingly, the weight of the preferred embodiment of the track having a 151 inch length illustrated in **FIG. 2A** has about the same weight as the weight of the track with three-pitch pattern having a 136 inch length illustrated in **FIG. 1A**.

[**0092**] There are several other reasons for this improved result of the track of the present invention having the reduced weight per same unit of track length in the present invention. First, it is noted that the lugs have been provided in a six-pitch pattern optimizing their placement along the transverse direction. Using the advantages of the three-pitch pattern over the two-pitch pattern, the profile-free regions are compensated over three successive pitches, although on some occasion the compensation is completed in two successive pitches. Second, the staggered relationship of the lugs on the outer lateral portions of the track reduces the incidents of unloaded paddles stemming from lugs provided on successive pitches along the longitudinal direction. Thus, each paddle is relied upon for a more balanced load, and the profile pattern of the present invention eliminates the inefficiency associated with the unloaded paddles. Third, some paddles have slopes like the slope **370** of the profile **341***d* shown **FIG. 4**. Because less mass is provided than having a

block shaped paddle, the total weight of that paddle is reduced. Fourth, as discussed below, the height of the middle section of the track along the transverse direction is reduced and therefore weighs less.

[0093] Indeed, the tread pattern shown in **FIGS. 3 and 4** has a further novel characteristic in that the height of the profiles of the track is not uniform throughout the track, as more clearly shown in shown in **FIG. 4**. Generally, in this "hybrid height" arrangement, the height of the profiles at the lateral ends of the track is higher than the height of the profiles at the center of the track, when viewed in the longitudinal direction. Preferably, the height of the profiles remain at the highest from the lateral ends toward where the idler wheels contact the inner side of the track.

[0094] In **FIG. 4**, an elevation view of the profiles **341***a* and **341***d* is illustrated. As can been seen in **FIG. 4** viewed in conjunction with **FIG. 3**, the height of the profiles on the outer lateral portions A and E of the track is constant and is higher than the height of the profiles on the central portion of the track. The profiles in the inner lateral sides of the track has both the higher height of the profiles on the outer later portion A and E and the lower height of the profiles on the central portion C of the track. In other words, each of the profiles immediately adjacent to and inside the sprocket engaging areas **323***a* and **323***b* have two portions each having a different height than the other with a slanted step-down area **362**.

[0095] For example, the profile **341***a* of the outer lateral portion A of the first pitch **331** has a height of H, which remains constant. The profile **343***c* of the central portion C of the third pitch **334** has a height of H_2, which also remains constant. As shown in **FIG. 4**, the profile **341***d* of the inner lateral portion D of the first pitch has three portions—a higher portion **364** having a height of H_1 and a lower portion **366** having a height of H_1 with a slanted step-down area **362** connecting the two portions. It is preferable that the step-down areas of the profiles the inner lateral portions B and D be placed on the inside of the areas which contacts the idler wheels on the inner side of the track.

[0096] In **FIG. 4**, there is illustrated a tower portion **368** in the higher portion **364** of the profile **341***d*, provided immediately before the step-down area **362** of the profile **341***d*. The tower portions provide reinforcement to the paddles and are located on each of the paddles. At the lateral ends of some profiles, there is provided slopes extending from the track body surface to the upper edge surface of the profiles. For example, the profile **341***d* has a slope **370** extending from the track body surface **321** to the upper edge surface **372** of the profile **341**d.

[0097] The overall effect of having H_1 on the lateral outer portions and H_2 on the central portions is that the hybrid height arrangement advantageously improves various performance characteristics of the track. First, the hybrid height profile arrangement provides improved floatability. Because the height of profiles toward the middle portion of the track is lower, these profiles engage less snow than the profiles on the lateral sides. Hence, when the snowmobile with the track moves, there will be more snow left under the track in the middle portion than the lateral portions. Accordingly, while the snowmobile would tend to assume a position deeper into the snow in the lateral portions, the snow left in the middle portion of the track aids the flotation of the snowmobile through the powder snow.

[0098] Second, the hybrid height profile arrangement assists in addressing the concerns over "pushing" where the snowmobile tends to loose a significant measure of steerability. The concern over pushing is particularly more acute in mountain snowmobiles having an extended long track length, such as greater than 141 inches. When the height of the paddles are reduced from 2 inches to 1¾ inches, the paddles with the reduced height will provide less traction. Thus, the inventors have found that the excessive traction force of the long length tracks can be decreased by reducing the height of the middle portion of the track only. In this way, the hill climbing or sidehilling capabilities provided by the two inch lugs on the outer lateral side of the track is substantially maintained.

[0099] On a related note, to further address the concerns over pushing, the profiles on the central portion C of the track have been provided so that they will repeat every third pitch. Inventors have found that it is desirable to have the lugs on the outer lateral portions A and E of the track provide as much traction force as possible to effectively provide the necessary traction when the weight of the sled and the rider is transferred laterally in sidehilling. At the same time, the lugs in the middle portion C can be unloaded and may not necessarily need to generate as powerful traction force as the lugs on the lateral ends of the track.

[0100] Therefore, the profiles on the central portion C, as shown in **FIGS. 3 and 7**, are provided every third pitch. For example, the profiles **343***c* in the third pitch **333** is followed by the profile **346***c* in the sixth pitch **336**. It can be further observed that the profiles **341***a*, **342***e*, **343***a*, **344***e*, **345***a* and **346***e* in the outer later ends A and E have substantially same lateral width as profiles **343***c* and **346***c* in the center portion C, while the profiles **341***d*, **342***b*, **344***b* and **345***d* provided on inner lateral portions B and D have comparably shorter lateral width. Thus, the profiles on the inner lateral portions B and D also contribute to alleviating concerns over too much pushing.

[0101] In the preferred embodiment, the H_2 is 2 inches, and H_1 is 1¾ inches. These parameters can be easily changed to 1¾ inches for the higher portion and **1½ for the lower portion. Yet even further, the hybrid height arrangement can be advantageously utilized in snowmobile applications other than mountain snowmobiles. For example, the flotation of any snowmobile can be improved with the hybrid height system. Therefore, the range of heights need not be restricted to between about** 1¼ and 2 inches.

[0102] The inventors have found that the combination of the six pitch tread pattern and the hybrid height profiles discussed above significantly improves the performance characteristics of a track. An example of such track was tested with a mountain snowmobile having a track with a nominal width of 15 inches and a nominal length of 151 inches. The height of the lugs were about 1¾ inches in the lower portion toward the middle of the track and 2 inches on the outer lateral portions. Previously, when a 151 inch track with conventional tread patterns was tried, the snowmobile was pushed too much, and therefore, resulted in poor steerability. To compensate again the loss of maneuverability, the inventors have experimented with various tread patterns, including the six pitch, hybrid height tread pattern of the present invention. When the tread pattern illustrated in **FIG. 2** was utilized, the inventors found that the track

provided an acceptable degree of maneuverability even with the long 151 inch track with two inch lugs on the lateral portions of the track and 1¾ inch lugs in the middle was providing increased traction. With the elongated length, the track provided an excellent hill climbing ability. Yet even more, the inventors have found that the lifting aided by the additional surface area of the long track and the hybrid height lugs provides superior flotation of the snowmobile.

C. Tunnel Extension

[0103] Because the snowmobile in the present invention is designed to utilize a track whose length is increased from the conventional regular length track, it is necessary to increase sizes of certain parts of the snowmobile and make several modifications to accommodate the added length in the track. In **FIG. 8**, the rear suspension systems and the tunnels of the snowmobiles shown in **FIGS. 1A and 1B** are illustrated to show the modification made to increase the track length to 151 inches. **FIG. 9A** shows a suspension system **402**, a tunnel **404**, a tunnel extension **406** and various parts comprising the suspension system, the tunnel, and the tunnel extension of a mountain snowmobile of the present invention. **FIG. 9B** shows a suspension system **402'**, a tunnel **404'**, and various parts comprising the suspension system and the tunnel of a mountain snowmobile of the prior art.

[0104] As shown in **FIG. 8**, the drive wheel **416** has been moved down and rearward slightly, and the rear idler wheel **410** has been relocated further back toward the aft of the snowmobile in comparison to the drive wheel **416'** and rear idler wheel **410'** of the prior art snowmobile illustrated in **FIG. 9B**. The locations of other inner idle wheels **417**, **418** and **423** have been altered slightly from their prior positions **417'**, **418'** and **423'**. Further, the positions of rear shock **414** and rear arm **412** have been also modified slightly in light of the increased length of the track. In addition, the slide frame **425** of the present invention in **FIG. 9A** is longer in axial length than the slide frame **425'** of the snowmobiles with the regular length 136 inch track in **FIG. 9B**. These above mentioned modifications are viewed as well within the skills of one of ordinary skill in the art. Further, the present invention shown in **FIG. 9A** contemplates addition of optional inner idle wheels **420**, **424**, **426**, which in themselves are not necessary to practice the present invention.

[0105] To accommodate the extra length of the track, the total tunnel length has been extended. Significantly, rather than designing a brand new longer tunnel for the snowmobiles to accommodate the added track length, an aspect of the present invention provides a tunnel extension **406** illustrated in **FIGS. 10A and 10B**.

[0106] The tunnel extension in accordance with this aspect of the present invention is formed of the same material as the tunnel. In the preferred embodiment illustrated in **FIGS. 10A and 10B**, the tunnel extension **406** is a flank formed aluminum. The tunnel extension is shaped to form a tapered end to give an integral appearance with the tunnel. The tunnel extension comprises a top panel **430**, a rear panel **432** and two side panels **434** and **436** as shown in **FIGS. 10A**. As shown in **FIG. 10B**, the tunnel extension is attached to the tunnel **404** with a plurality of rivets and/or bolts in a manner known to one of skilled in the art. The side panels **434** and **436** have flange portions **438** and **440** that are configured for bolt and rivet connection to the tunnel **404** as shown in **FIGS. 10A and 10B**. Also as shown in **FIGS. 10A and 10B**, a substantially U-shaped bumper **442** is connected to both the tunnel **404** and the tunnel extension **406** around side panels **405** and **407** of the tunnel **404**, the side panels **434** and **436** of the tunnel extension **406**. The bumper **442** is connected to the side panels **405** and **406** of the tunnel and the side panels **434** and **436** of the tunnel extension **406** by rivets and bolts. The bumper **442** also acts as a handle with which the snowmobile can be pulled when the sled gets stuck in snow.

[0107] The added length of the track could have been accommodated by building a new longer tunnel as known in the art. Rather than building another longer tunnel, however, the present invention provides a tunnel extension **406** which could achieve cost savings. In other words, the tunnel extension is advantageous whenever the length of tunnel needs to be extended, but the cost benefit analysis or other considerations indicates that a new design of a longer tunnel is not desirable. The tunnel extension can easily and advantageously provide the extra length in the tunnel.

[0108] While the invention has been described with reference to several preferred embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the spirit and scope of the present invention. In addition, many modifications may be made to adapt a particular situation, component, or material to the teachings of the present invention without departing from its teachings as claimed.

APPENDIX A

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
Australia	Filed	50113/01		Jun. 04, 2001		Personal Watercraft and Off-Power Steering System for a Pers
Austria	Granted	A 957/92	399209	May 12, 1992	Apr. 25, 1995	Variable ratio drive pulley
Austria	Granted	A 116/91	402954	Jan. 21, 1991	Oct. 27, 1997	Variable geometry tiller
Belgium	Filed	98958757.1		Dec. 03, 1998		Casque
Canada	Granted	390,944	1,163,835	Nov. 28, 1981	Mar. 20, 1984	Speedometer drive
Canada	Granted	459,037	1,208,040	Jul. 17, 1984	Jul. 22, 1986	Drive pulley
Canada	Granted	502,719	1,228,884	Feb. 26, 1986	Nov. 03, 1987	Snowmobile slide suspension (Formula Plus)
Canada	Granted	502,718	1,231,123	Feb. 26, 1986	Jan. 05, 1988	Snowmobile ski suspension
Canada	Granted	502,716	1,232,928	Feb. 26, 1986	Feb. 16, 1988	Snowmobile frame structure
Canada	Granted	589,764	1,299,224	Feb. 01, 1989	Apr. 21, 1992	Track cleat
Canada	Granted	611,371	1,328,379	Sep. 14, 1989	Jan. 25, 1994	Liquid level sight gauge
Canada	Granted	613,795	1,332,290	Sep. 27, 1989	Oct. 11, 1994	Speedometer conversion

APPENDIX A-continued

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
Canada	Granted	612,079	1,332,623	Sep. 20, 1989	Oct. 18, 1994	Snowmobile ski suspension (Safari)
Canada	Granted	2,007,801	2,007,801	Jan. 16, 1990	Jun. 23, 1998	Carburetor with high altitude compensator
Canada	Granted	2,008,235	2,008,235	Jan. 22, 1990	Aug. 31, 1999	Variable geometry tiller
Canada	Granted	2,012,027	2,012,027	Mar. 13, 1990	Apr. 23, 1998	Reverse rotation engine
Canada	Granted	2,018,591	2,018,591	Jun. 08, 1990	Nov. 20, 2001	Snowmobile ski including runner, sole and stiffener (High sp
Canada	Granted	2,095,981	2,095,981	May 11, 1993	Jun. 25, 2002	Variable ratio drive pulley
Canada	Granted	2,216,481	2,216,481	Sep. 26, 1997	Feb. 27, 2001	System for reversing 2 stroke engine
Canada	Granted	2,228,759	2,228,759	Feb. 04, 1998	Jul. 01, 2003	Noise Reducing System
Canada	Granted	2,057,434	2,057,434	Dec. 11, 1991	Nov. 24, 1998	Snowmobile suspension
Canada	Granted	2,312,815	2,312,815	Dec. 03, 1988	Oct. 29, 2002	Helmet
Canada	Granted	2,354,131	2,354,131	Dec. 03, 1996	Sep. 30, 2003	Helmet
Canada	Filed	2,276,648		Jun. 23, 1999		All Terrain Vehicle w/improved motor arrangement
Canada	Filed	2,276,643		Jun. 23, 1989		Straddle-Type All Terrain Vehicle with Progressive Different
Canada	Filed	2,250,878		Oct. 21, 1998		Transmission System for a Straddel Type Vehicle
Canada	Filed	2,202,330		Apr. 10, 1997		All Terrain Vehicle
Canada	Filed	2,354,742		Jun. 06, 2001		Fender structure for an all terrain vehicle
Canada	Filed	2,351,301		Jun. 26, 2001		Gear Shift Assembly for straddle-type vehicle
Canada	Filed	2,306,887		May 19, 2000		All terrain vehicle (DS850)
Canada	Filed	2,337,733		Feb. 22, 2001		Shipping Method and System
Canada	Filed	2,438,015		Nov. 29, 2001		Inboard Brake System for a Straddle-type All Terrain Vehicle
Canada	Filed	2,390,603		Jun. 13, 2002		Frames for All-Terrain Vehicles
Canada	Filed	2,366,455		May 14, 2002		Swing Arm for All Terrain Vehicle
Canada	Filed	2,429,694		May 21, 2003		Straddle Type ATV with Mechanical Actuated Brake System
Canada	Filed	2,437,458		Aug. 11, 2003		Modular Headlight System for Recreational Vehicles
Canada	Filed	2,443,761		Oct. 20, 2003		Fuel Tank for ATV
Canada	Filed	2,422,394		Mar. 11, 2003		Breathing Mask Adjuster
Canada	Filed	2,422,239		Mar. 11, 2003		Breathing Mask Adjuster
Canada	Filed	2,422,392		Mar. 11, 2003		Cold-Weather Helmet with Breathing Mask breathing air from inside the helmet
Canada	Filed	2,422,025		Mar. 11, 2003		Helmet with Breathing Mask Air Passages
Canada	Filed	2,422,145		Mar. 12, 2003		Cold-Weather Helmet with Breathing Mask Pivoting Forward and
Canada	Filed	2,422,406		Mar. 12, 2003		Cold-Weather Helmet with spring loaded sunshield
Canada	Filed	2,422,397		Mar. 12, 2003		Cold-Weather Helmet with spring loaded sunshield
Canada	Filed	2,422,400		Mar. 12, 2003		Cold-Weather Helmet with heated eye shield
Canada	Filed	2,422,236		Mar. 12, 2003		Cold-Weather Helmet eye shield having a translucent portion
Canada	Filed	2,365,560		Dec. 19, 2001		Windshield Assembly for an All Terrain Vehicle
Canada	Filed	2,425,484		Apr. 14, 2003		Stator Vane and Impeller-Drive Shaft Arrangements and Person
Canada	Filed	2,427,782		May 02, 2003		Convertible Personal Watercraft (barracoda)
Canada	Filed	2,255,275		Dec. 03, 1988		Turning Aid Nozzle
Canada	Filed	2,306,193		Apr. 19, 2000		Watercraft with Steer Responsive Throttle
Canada	Filed	2,255,276		Dec. 03, 1998		Carrier Rack for Use on a Watercraft
Canada	Filed	2,333.831		Feb. 05, 2001		Personal Watercraft and Off-Power Steering System for a Personal Watercraft
Canada	Filed	2,398,479		Jul. 31, 2002		Personal Watercraft and Off-Power Steering System
Canada	Filed	2,351,293		Jun. 22, 2001		Personal Watercraft Having an improved Exhaust System
Canada	Filed	2,383,891		Apr. 29, 2002		Huti with Deck Supporting Posts
Canada	Filed	2,383,856		Apr. 28, 2002		Fluid Reservoir
Canada	Filed	2,323,987		Oct. 20, 2000		Watercraft having a closed coolant circulating system with a
Canada	Filed	TBA		Dec. 04, 2003		Mobile Electronic Video Game
Canada	Filed	2,153,101		Jun. 30, 1995		Snowmobile transmission jackshaft (Drive train)
Canada	Filed	2,143,802		Mar. 02, 1995		Track noise suppression
Canada	Filed	2,191,008		Nov. 22, 1998		Rear suspension system for a land vehicle
Canada	Filed	2,293,108		Dec. 23, 1999		Snowmobile (REV)
Canada	Filed	2,350,345		Jun. 12, 2001		Snowmobile rider Positioning
Canada	Filed	2,411,984		Nov. 15, 2002		Snowmobile with Active Rider Positioning
Canada	Filed	2,217,959		Oct. 09, 1997		Electronic Compensation System
Canada	Filed	2,277,729		Jul. 13, 1999		Adjustable Rear Suspension for a Tracked Vehicle

APPENDIX A-continued

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
Canada	Filed	2,437,787		Mar. 12, 2001		Systems and Methods for Automatic Carburetor Enrichment During Cold Start
Canada	Filed	2,358,154		Oct. 03, 2001		Adjustable Apparatus and Kit for a Coupled Snowmobile Suspension
Canada	Filed	2,350,270		Jun. 12, 2001		Front suspension with three ball joints for a vehicle
Canada	Filed	2,371,477		Feb. 11, 2002		Fuel tank for a recreational vehicle
Canada	Filed	2,350,264		Jun. 12, 2001		Frame construction for a vehicle
Canada	Filed	2,427,235		Apr. 28, 2003		Suspension Assembly
Canada	Filed	2,352,938		Jun. 12, 2001		Snowmobile Engine Mount
Canada	Filed	2,434,780		Jun. 12, 2001		Mounting Element for an Engine
Canada	Filed	2,435,021		Aug. 12, 2001		Snowmobile Engine Mount
Canada	Filed	2,434,788		Aug. 12, 2001		A Method for Assembling a Vehicle
Canada	Filed	2,385,195		Dec. 14, 2001		Detachable Windshield for Snowmobile
Canada	Filed	2,373,337		Feb. 26, 2002		Snowmobile Slide Rail System
Canada	Filed	2,403,419		Sep. 13, 2002		Shock Absorber with a Floating Piston
Canada	Filed	2,373,388		Feb. 26, 2002		Shock absorber adjustable in compression
Canada	Filed	2,298,749		Feb. 10, 2000		Shock linkage assembly for a snowmobile rear suspension system
Canada	Filed	2,317,932		Sep. 08, 2000		Apparatus and kit for coupling a snowmobile suspension
Canada	Filed	2,345,819		Feb. 11, 2000		A Long Track Mountain Snowmobile and a Track Therefor
Canada	Filed	2,371,787		Feb. 11, 2000		A Snowmobile Drive Track
Canada	Filed	2,409,811		Oct. 28, 2002		Shock Absorber with a Gas Chamber on a Rebound Side of a Piston
Canada	Filed	2,350,285		Jun. 12, 2001		Engine cradle for a vehicle (REV)
Canada	Filed	2,435,034		Jun. 12, 2001		Snowmobile Frame
Canada	Filed	2,435,039		Jun. 12, 2001		Foot Hold
Canada	Filed	2,350,348		Jun. 12, 2001		Side Panel for a Recreational Vehicle
Canada	Filed	2,419,899		Feb. 26, 2003		Luminescent Gauge
Canada	Filed	2,350,274		Jun. 12, 2001		Snowmobile with Pivotable Rear Snow Flap
Canada	Filed	2,435,028		Jun. 12, 2001		Snowmobile with Pivotable Rear Snow Flap
Canada	Filed	2,361,197		Nov. 07, 2001		A Latch Mechanism for a Snowmobile engine cover
Canada	Filed	2,363,856		Nov. 27, 2001		A Snowmobile with a Turbocharged 4 Stroke Engine
Canada	Filed	2,400,913		Aug. 30, 2002		Engine Control
Canada	Filed	2,418,679		Feb. 11, 2003		Quick Release Passenger Seat with Flexible Grab Handle
Canada	Filed	2,440,521		Aug. 11, 2003		Onboard Communication System for a Recreational Vehicle
Canada	Filed	2,432,320		Jun. 13, 2003		Straddle-Type Mesh Seat
Canada	Filed	2,436,497		Aug. 05, 2003		Drive Sprocket for a Tracked Vehicle
Canada	Filed	TBA		Nov. 25, 2003		Rear Fairing for a Snowmobile
Canada	Filed	2,436,493		Aug. 05, 2003		Vehicle Track Providing Enhanced Steerability
Canada	Filed	2,434,188		Jul. 02, 2003		Side Panel for a snowmobile
Canada	Filed	2,441,643		Oct. 08, 2003		Snowmobile Suspension Geometry
Canada	Filed	TBA		Nov. 28, 2003		Latch
Canada	Filed	TBA		Nov. 27, 2003		Modular Snowmobile Platform
Canada	Filed	TBA		Dec. 04, 2003		A Methodology for the Design and Manufacture of a Family of
Canada	Filed	2,418,681		Feb. 11, 2003		Flexible Grab Handle
Canada	Filed	2,443,767		Oct. 16, 2003		R3R Three Wheel Vehicle and Concentric Intermediate Sprocket
Canada	Filed	2,355,057		Jan. 08, 1999		Snow Groomers and Control Systems Therefor
Canada	Filed	2,394,621		Dec. 15, 2000		Snow Groomer Having an Improved Variable Geometry Tiller Ass
Canada	Filed	2414630		Dec. 13, 2002		Hydrostatic Motor Drive Mount
Canada	Filed	2,443,765		Oct. 22, 2003		Snow Groomer Flow Assembly
Canada	Filed	2,440,934		Sep. 18, 2003		Kit To Transform a Tracked Vehicle To A Wheeled Vehicle
Canada	Filed	2,368,685		Jan. 07, 2002		Muffler and Spark Arrester
Canada	Filed	2,350,972		Jun. 18, 2001		Hydraulic Pump for an ATV
Canada	Filed	2,440,948		Sep. 17, 2003		All Terrain Vehicle and Rack Therefor
Canada	Filed	2,427,730		May 02, 2003		Suspension Arm Arrangement for Straddle-Type All-Terrain Vehicle
Canada	Filed	2,434,871		Jul. 03, 2003		Carburetor Hester for ATV (SC)
Canada	Filed	TBA		Sep. 09, 2003		Service Center for a Recreational Vehicle (MR)
Canada	Filed	2,409,812		Oct. 28, 2002		Shock absorber with Adjustable valving
Canada	Filed	2,392,928		Jul. 10, 2002		Spindle for convertable ski stance
Canada	Filed	2,431,381		Dec. 06, 2001		Virtual Breaking System for Hydrostatically Driven Vehicle

APPENDIX A-continued

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
Canada	Filed	2,403,753		Mar. 21, 2001		Snow Groomer Having a Tiller Assembly with a Variable Snow C
Canada	Filed	2,441,650		Oct. 08, 2003		Level Wind Apparatus for use on a Snow Grooming vehicle
Canada	Filed	2,410,728		Oct. 31, 2002		Hydraulic Damping Device
Europe	Granted	98958757.1	1035896	Dec. 03, 1998	Oct. 08, 2003	Helmet
Europe	Filed	01130658.6		Dec. 03, 1998		Helmet
Europe	Filed	1916795.6		Mar. 21, 2001		Snow Groomer Having a Tiller Assembly with a Variable Snow C
France	Filed	98958757.1		Dec. 03, 1998		Casque
Germany	Granted	29824777.1	29824777.1	Dec. 03, 1998	Aug. 22, 2002	Breathing Mask for a Helmet
Germany	Granted	4101617.3	4101517.3	Jan. 21, 1991	Aug. 18, 1998	Variable geometry tiller
Germany	Filed	98958757.1		Dec. 03, 1998		Casque
Germany	Filed	TBA		Dec. 03, 1998		Helmet
Great Britain	Filed	98958757.1		Dec. 03, 1998		Casque
Japan	Filed	2003-131292		May 09, 2003		Hydraulic Damper
Japan	Filed	2002-209430		Jul. 18, 2002		Hydraulic Damping Device
Italy	Filed	98958757.1		Dec. 03, 1998		Helmet
PCT	Filed	PCT/CA02/01754		Nov. 13, 2002		ATV with improved Driver Positioning and Single or Multi Pas
PCT	Filed	PCT/US01/44320		Nov. 29, 2001		Inboard Brake System for a Straddle-type All Terrain Vehicle
PCT	Filed	PCT/CA98/01126		Dec. 03, 1998		Breathing Mask for a Helmet
PCT	Filed	PCT/CA03/00385		Mar. 12, 2003		Breathing Mask Adjuster
PCT	Filed	PCT/CA03/00365		Mar. 12, 2003		Cold-Weather Helmet with Breathing Mask Pivoting Forward and
PCT	Filed	PCT/CA03/00367		Mar. 12, 2003		Cold-Weather Helmet with spring loaded sunshield
PCT	Filed	PCT/CA01/00307		Mar. 12, 2001		Systems end Methods for Automatic Carburetor Enrichment Durl
PCT	Filed	PCT/US00/03401		Feb. 11, 2000		A Long Track Mountain Snowmobile and a Track Therefor
PCT	Filed	PCT/CA03/00249		Feb. 24, 2003		R3R Components for a Three-Wheeled Vehicle to Permit Leaning
PCT	Filed	pct/ca02/01565		Oct. 16, 2002		R3R Three Wheel Vehicle Having a Split Radiator and an Inter
PCT	Filed	PCT/CA03/00248		Feb. 24, 2003		R3R Three Wheel Vehicle with a Continuously Variable Transml
PCT	Filed	PCT/CA01/01747		Dec. 06, 2001		Virtual Breaking System for Hydrostatically Driven Vehicle
USA	Filed	TBA		Aug. 14, 2003		Deck Boat (Buddy Seat)
USA	Granted	06/585,446	4,575,363	Mar. 02, 1984	Mar. 11, 1986	Drive pulley
USA	Granted	06/706,188	4,520,604	Feb. 27, 1985	Nov. 04, 1988	Snowmobile frame structure
USA	Granted	06/706,185	4,671,521	Feb. 27, 1985	Jun. 09, 1987	Snowmobile ski suspension
USA	Granted	07/250,288	4,899,610	Sep. 28, 1988	Feb. 13, 1990	Throttle lever
USA	Granted	07/400,806	4,987,777	Aug. 30, 1989	Jan. 29, 1991	Liquid level sight gauge
USA	Granted	07/485,655	4,991,911	Feb. 22, 1990	Feb. 12, 1991	Track clast
USA	Granted	07/465,423	5,021,198	Jan. 16, 1990	May 04, 1991	Carburetor with high altitude compensator
USA	Granted	07/612,465	5,036,802	Nov. 14, 1990	Aug. 06, 1991	Reverse rotation engine
USA	Granted	07/612,453	5,067,263	Nov. 14, 1990	Nov. 26, 1991	Variable geometry tiller
USA	Granted	07/550,995	5,061,868	Jul. 11, 1990	Jan. 21, 1992	Speedometer conversion
USA	Granted	07/547,240	5,165,709	Jul. 03, 1990	Nov. 24, 1992	Snowmobile ski including runner, sole and stiffener (High sp
USA	Granted	07/690,362	5,209,703	Apr. 24, 1991	May 11, 1993	Drive pulley (TTL improved)
USA	Granted	08/060,158	5,326,330	May 11, 1993	Jul. 05, 1994	Variable ratio drive pulley
USA	Granted	07/985,899	5,369,360	Dec. 04, 1992	Nov. 29, 1994	Recessed paddle wheel speed measuring device for personal we
USA	Granted	08,235,635	5,542,371	Apr. 29, 1994	Aug. 06, 1996	Seat suspension For watercraft
USA	Granted	08/443,881	5,603,281	May 30, 1995	Feb. 16, 1997	Seat suspension for watercraft
USA	Granted	08/426,918	5,607,026	Apr. 21, 1995	Mar. 04, 1997	Snowmobile transmission jackshaft (Drive train)
USA	Granted	08/545,550	5,690,520	Oct. 19, 1995	Nov. 25, 1997	Weed removal apparatus for a jet pump propelled watercraft
USA	Granted	08/740,607	5,692,983	Oct. 31, 1996	Dec. 02, 1997	Variable ratio drive pulley (Rotax clutch-cushion drive)
USA	Granted	08/361,761	5,709,440	Feb. 01, 1995	Jan. 20, 1998	Track noise suppression
USA	Granted	08/393,109	5,713,645	Feb. 22, 1995	Feb. 03, 1998	Snowmobile track profile
USA	Granted	08/640,500	5,746,054	May 01, 1996	May 05, 1998	Method and apparatus for tuned pipe water injection
USA	Granted	08/721,099	5,784,574	Sep. 27, 1996	Aug. 18, 1998	System for reversing 2 stroke engine
USA	Granted	08/551,291	5,797,816	Oct. 31, 1995	Aug. 25, 1998	Variable ratio drive pulley with damping structure (TRA Clut
USA	Granted	08/632,581	5,880,486	Apr. 15, 1998	Jan. 19, 1999	Rear suspension system for a land vehicle

APPENDIX A-continued

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
USA	Granted	08/661,381	5,863,229	Jun. 11, 1998	Jan. 25, 1999	Variable venturi
USA	Granted	09/020,170	6,019,648	Feb. 08, 1998	Feb. 01, 2000	Noise Reducing System
USA	Granted	09/204,465	6,102,756	Dec. 03, 1998	Aug. 15, 2000	Turning Aid Nozzle
USA	Granted	09/246,286	6,157,774	Feb. 08, 1998	Jan. 02, 2001	Handlebar-Mountable Ergonomic Shifter for a Motor Vehicle
USA	Granted	09/088,854	6,174,210	Jun. 02, 1998	Jan. 16, 2001	Watercraft Control Mechanism
USA	Granted	08/948,064	6,186,117	Oct. 09, 1997	Feb. 13, 2001	Electronic Compensation System
USA	Granted	09/204,690	6,189,753	Dec. 03, 1998	Feb. 20, 2001	Carrier Rack for Use on a Watercraft
USA	Granted	09/137,605	6,206,124	Aug. 21, 1998	Mar. 27, 2001	Adjustable Rear Suspension for a Tracked Vehicle
USA	Granted	09/206,073	6,244,227	Dec. 04, 1998	Jun. 12, 2001	Valve Assembly Using Pressurized Medium for Controlling Operating Conditions of a Two-Stroke Engine
USA	Granted	09/338,637	6,257,081	Jun. 23, 1999	Jul. 10, 2001	Transmission System for a Straddle Type Vehicle
USA	Granted	09/624,256	6,276,291	Jul. 24, 2000	Aug. 21, 2001	Adjustable Steering Column
USA	Granted	09/338,749	6,296,073	Jun. 23, 1999	Oct. 02, 2001	All Terrain Vehicle with Improved Motor Arrangement
USA	Granted	09/383,073	6,336,833	Aug. 28, 1999	Jan. 08, 2002	Watercraft with Stear Responsive Throttle
USA	Granted	09/868,187	6,354,023	Jan. 08, 1999	Mar. 12, 2002	Snow Groomers and Control Systems Therefor
USA	Granted	09/904,742	6,405,669	Jul. 16, 2001	Jun. 16, 2002	Low Speed Steering System
USA	Granted	09/997,952	6,419,533	Oct. 17, 2001	Jul. 16, 2002	Noise Reducing System
USA	Granted	09/961,387	6,428,371	Sep. 25, 2001	Aug. 08, 2002	Watercraft with Steer Responsive Responsive Engine Speed Con
USA	Granted	09/938,830	6,435,119	Aug. 27, 2001	Aug. 20, 2002	Watercraft Air Intake System
USA	Granted	09/689,788	6,439,328	Oct. 13, 2000	Aug. 27, 2002	Adjustable Air Vent for a Vehicle
USA	Granted	09/877,064	6,446,744	Jun. 11, 2001	Sep. 10, 2002	Engine cradle for a vehicle
USA	Granted	09/858,163	6,467,561	Sep. 08, 2000	Oct. 22, 2002	Apparatus and kit for coupling a snowmobile suspension
USA	Granted	09/969,888	6,478,098	Oct. 04, 2001	Nov. 12, 2002	Adjustable Apparatus and Kit for a Coupled Snowmobile Suspension
USA	Granted	09/555,272	6,488,553	Jun. 22, 2001	Dec. 03, 2002	Driveshaft with a resiliently deformable cushioning structur
USA	Granted	09/877,213	6,491,125	Jun. 11, 2001	Dec. 10, 2002	Snowmobile with Pivotable Rear Snow Flap
USA	Granted	09/339,517	6,491,126	Jun. 24, 1999	Dec. 10, 2002	Straddle-Type All Terrain Vehicle with Progressive Different
USA	Granted	09/701,045	6,510,013	Feb. 11, 2000	Jan. 28, 2003	A Long Track Mountain Snowmobile and a Track Therefore
USA	Granted	09/850,173	6,523,489	May 08, 2001	Feb. 25, 2003	Personal Watercraft and Off-Power Steering System for a Pers
USA	Granted	09/057,652	6,523,634	Apr. 09, 1998	Feb. 25, 2003	All Terrain Vehicle
USA	Granted	10/173,532	6,524,146	Jun. 18, 2002	Feb. 25, 2003	Watercraft Having Auxillary Steering
USA	Granted	09/753,461	6,524,224	Jan. 04, 2001	Feb. 25, 2003	Transmission System for a Straddle Type Vehicle
USA	Granted	09/942,728	6,533,623	Aug. 31, 2001	Mar. 18, 2003	Thrust Reversing Nozzle Assembly for WC (Reversing Gate)
USA	Granted	09/691,129	6,544,085	Oct. 19, 2000	Apr. 08, 2003	Watercraft Having a Closed Coolant Circulating System with a
USA	Granted	09/⑦5,610	5,5⑦,688	Jun. 22, 2001	Apr. 15, 2003	Improved removable stabilizing fin for watercraft
USA	Granted	09/574,234	6,547,027	May 19, 2000	Apr. 15, 2003	All terrain vehicle (DS650)
USA	Granted	09/886,464	6,551,155	Jul. 22, 2001	Apr. 22, 2003	Personal Watercraft Having an Improved Exhaust System
USA	Granted	09/942,956	6,554,863	Aug. 31, 2001	May 20, 2003	Transmission System for a Straddle Type Vehicle
USA	Granted	10/175,448	5,568,970	Jun. 20, 2002	May 27, 2003	Vehicle having Improved Fuel, Lubrication and Air Intake Sys
USA	Granted	09/891,868	5,588,537	Aug. 28, 2001	Jul. 08, 2003	Gear Shift Assembly for straddle-type vehicle
USA	Granted	10/174,940	8,592,415	Jun. 20, 2002	Jul. 15, 2003	Vehicle having Improved Fuel, Lubrication and Air Intake Sys
USA	Granted	09/942,727	6,592,727	Aug. 31, 2001	Jul. 15, 2003	Thrust Reversing Nozzle Assembly for WC (Reversing Gate)
USA	Granted	10/224,649	6,595,311	Aug. 21, 2002	Jul. 22, 2003	A vehicle with a base plate & an engine mount
USA	Granted	10/021,308	6,595,611	Dec. 19, 2001	Jul. 22, 2003	Personal Watercraft vehicle component multiplex communication system
USA	Granted	10/141,134	6,504,594	May Sep. 2002	Aug. 12, 2003	Foot Hold
USA	Granted	10/224,560	8,604,600	Aug. 21, 2002	Aug. 12, 2003	Method for assembling a vehicle
USA	Granted	09/586,616	8,606,751	Jun. 02, 2000	Aug. 19, 2003	Breathing Mask for a Helmet
USA	Granted	10/259,318	6,609,771	Sep. 30, 2002	Jun. 26, 2003	A Mountain Track for a Snowmobile
USA	Granted	10/141,855	6,619,417	May 10, 2002	Sep. 18, 2003	Snowmobile Slide Roll System
USA	Granted	09/949,038	5,526,260	Sep. 10, 2001	Sep. 30, 2003	All Terrain Vehicle
USA	Granted	09/778,801	6,631,776	Feb. 08, 2001	Oct. 14, 2003	Shock linkage assembly for a Snowmobile suspension system
USA	Granted	09/930,271	6,637,538	Aug. 16, 2001	Oct. 28, 2003	All Terrain Vehicle with Improved Motor Arrangement
USA	Granted	09/944,390	6,644,144	Sep. 04, 2001	Nov. 11, 2003	Rotatably mounted throttle assembly
USA	Granted	10/075,982	6,644,308	Feb. 15, 2002	Nov. 11, 2003	Helmet

APPENDIX A-continued

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
USA	Granted	10/013,888	6,648,093	Dec. 13, 2001	Nov. 18, 2003	Engine Mounting Structure for All Terrain Vehicle
USA	Granted	09/926,468	6,651,764	Aug. 14, 2001	Nov. 25, 2003	Fuel tank for a recreational vehicle
USA	Granted	09/877,211	6,651,788	Aug. 11, 2001	Nov. 25, 2003	Snowmobile Engine Mount
USA	Granted	09/877,214	6,655,487	Jun. 11, 2001	Dec. 02, 2003	Front suspension with three ball joints for a vehicle
USA	Granted	09/947,548	8,656,088	Sep. 07, 2001	Dec. 02, 2003	Pulley having progressively variable sheave angle
USA	Granted	08,567/344	RE38,124	Nov. 30, 1995	May 27, 2003	Snowmobile suspension
USA	Filed	TBA		Aug. 14, 2003		Deck Boat (Buddy Seat)
USA	Filed	10/840,678		Aug. 14, 2003		Deck Boat
USA	Granted	09/950,926	6,659,566	Sep. 13, 2001	Dec. 09, 2003	Cargo Carrying Compartments of an All Terrain Vehicle
USA	Filed	09/250,332		Feb. 16, 1999		Adjustable Windshield
USA	Filed	09/472,134		Dec. 23, 1999		Snowmobile (REV)
USA	Filed	09/483,856		Jan. 18, 2000		Adjustable Windshield
USA	Filed	09/490,757		Jan. 24, 2000		Noise Reducing System
USA	Filed	09/789,813		Feb. 22, 2001		Shipping Method and System
USA	Filed	09/824,876		Apr. 04, 2001		Frames for All-Terrain Vehicles
USA	Filed	09/877,188		Jun. 11, 2001		Snowmobile rider positioning
USA	Filed	09/877,180		Jun. 11, 2001		Side Panel for a Recreational Vehicle
USA	Filed	09/877,212		Jun. 11, 2001		Frame construction for a vehicle
USA	Filed	09/880,022		Jun. 14, 2001		Hydraulic Pumps for an ATV
USA	Filed	09/922,237		Aug. 06, 2001		Fender structure for an all terrain vehicle
USA	Filed	09/925,729		Aug. 10, 2001		Watercraft having air/water separating device
USA	Filed	09/928,659		Aug. 14, 2001		Snowmobile aid with offset runner and keel (X-Carve)
USA	Filed	09/932,445		Aug. 20, 2001		System, method and apparatus for controlling vehicle perform
USA	Filed	09/932,971		Aug. 21, 2001		Suspension system for an all terrain vehicle
USA	Filed	09/942,673		Aug. 31, 2001		Air Intake for a straddle-type all terrain vehicle
USA	Filed	09/966,158		Nov. 07, 2001		A Letch Mechanism for a Snowmobile
USA	Filed	09/987,202		Nov. 13, 2001		A Snowmobile with a Turbocharged 4 Stroke Engine
USA	Filed	09/995,688		Nov. 29, 2001		Inboard Brake System for a Straddle-type All Terrain Vehicle
USA	Filed	10/014,603		Dec. 14, 2001		Detachable Windshield for Snowmobile
USA	Filed	10/021,572		Dec. 19, 2001		Windshield Assembly for an All Terrain Vehicle
USA	Filed	10/061,184		Feb. 04, 2002		Snowmobile Ski
USA	Filed	10/082,347		Feb. 26,2002		Shock absorber adjustable in compression
USA	Filed	10/095,084		Mar. 12, 2002		All Terrain Vehicle
USA	Filed	10/126,482		Apr. 29, 2002		Fluid Reservoir
USA	Filed	10/133,358		Apr. 29, 2002		Hull with Deck Supporting Posts
USA	Filed	10/141,135		May 09, 2002		Snowmobile Frame
USA	Filed	10/143,857		May 14, 2002		Swing Arm for All Terrain Vehicle
USA	Filed	10/168,155		Dec. 15, 2000		Snow Groomer Having an improved Variable Geometry Tiller Ass
USA	Filed	10/173,555		Jun. 18, 2002		Method and System for Preventing Fluid From Flowing Along a
USA	Filed	10/174,567		Jun. 18, 2002		Adjustable Air Vent for a Vehicle
USA	Filed	10/189,578		Jul. 08, 2002		Spindle for convertable ski stance
USA	Filed	10/184,882		Jul. 15, 2002		Personal Watercraft with Rear Handle
USA	Filed	10/195,324		Jul. 16, 2002		Personal Watercraft and Off-Power Steering System
USA	Filed	10/211,573		Aug. 05, 2002		Cargo Carrying Compartments of an All Terrain Vehicle
USA	Filed	10/217,325		Aug. 13, 2002		Shielding Fairing for a Personal Watercraft
USA	Filed	10/217,611		Aug. 14, 2002		Parking Gear Assembly for an All Terrain Vehicle
USA	Filed	10/218,898		Aug. 15, 2002		Personal Watercraft with Storage Tray
USA	Filed	10/223,696		Aug. 20, 2002		Watercraft Having a Jet Propulsion System That Generates Imp
USA	Filed	10/223,697		Aug. 20, 2002		Jet Pump Bearing Assembly
USA	Filed	10/224,553		Aug. 21, 2002		Mounting Element for an Engine
USA	Filed	10/226,221		Aug. 23, 2002		Snowmobile with Pluatable Rear Snow Flap
USA	Filed	10/231,472		Aug. 30, 2002		R3R Three Wheel Vehicle and Rear Suspension Therefor
USA	Filed	10/233,659		Sep. 04, 2002		Watercraft Control Mechanism
USA	Filed	10/237,087		Sep. 09, 2002		Noise reducing engine enclosure
USA	Filed	10/239,519		Mar. 03, 2003		Snow Groomer Having a Tiller Assembly with a Variable Snow C
USA	Filed	10/242,559		Sep. 13, 2002		Shock Absorber with a Floating Piston
USA	Filed	10/259,314		Sep. 30, 2002		A Snowmobile having a Mountain Track
USA	Filed	10/274,384		Oct. 21, 2002		R3R Three Wheel Vehicle Having an Oil Cooler Assembly

APPENDIX A-continued

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
USA	Filed	10/282,233		Oct. 29, 2002		Shock Absorber with a Gas Chamber on a Rebound Side of the P
USA	Filed	10/282,260		Oct. 29, 2002		Shock absorber with Adjustable valving
USA	Filed	10/282,813		Nov. 13, 2002		ATV with Improved Driver Positioning and/or Multi Passenger
USA	Filed	10/284,892		Nov. 15, 2002		Snowmobile Having Active Driver Positioning
USA	Filed	10/318,381		Dec. 13, 2002		Hydrostatic Motor Drive Mount
USA	Filed	10/320,376		Dec. 17, 2002		Engine Control
USA	Filed	10/346,188		Jan. 17, 2003		R3R Three Wheel Vehicle and Rear Suspension Therefor
USA	Filed	10/346,189		Oct. 21, 2002		R3R Three Wheel Vehicle Having an Oil Cooler Assembly
USA	Filed	10/381,680		Feb. 11, 2003		Flexible Grab Handle
USA	Filed	10/381,682		Feb. 11, 2003		Quick Release Passenger Seat with Flexible Grab Handle
USA	Filed	10/387,773		Feb. 19, 2003		Method of Cooperative Advertising and Interactive System The
USA	Filed	10/387,915		Feb. 19, 2003		Method of Cooperative Advertising and Interactive System The
USA	Filed	10/368,448		Feb. 20, 2003		Personal Watercraft Having an improved Exhaust System
USA	Filed	10/389,685		Feb. 21, 2003		Personal Watercraft Having a Removable Padestral
USA	Filed	10/370,264		Feb. 21, 2003		Watercraft Having a Closed Coolant Circulating System with a
USA	Filed	10/370,673		Feb. 24, 2003		Watercraft Suspension
USA	Filed	10/371,223		Feb. 24, 2003		R3R Three Wheel Vehicle and Concentric Intermediate Sprocket
USA	Filed	10/371,224		Feb. 24, 2003		R3R Frame Construction for a Three Wheel Vehicle
USA	Filed	10/371,226		Feb. 24, 2003		R3R Three Wheel Vehicle with a Continuously Variable Transml
USA	Filed	10/371,228		Feb. 24, 2003		R3R Three-Wheeled Vehicle and Fancier Assembly and Lighting
USA	Filed	10/371,230		Feb. 24, 2003		R3R Components for a Three-Wheeled Vehicle to Permit Leaning
USA	Filed	10/371,232		Feb. 24, 2003		R3R An Ergonomic Arrangement for a Three Wheel Vehicle
USA	Filed	10/371,233		Feb. 24, 2003		Vehicle and Adjustable Steering shaft Thereof
USA	Filed	10/373,593		Feb. 26, 2003		Luminescent Gauge
USA	Filed	10/386,019		Mar. 12, 2003		Cold-Weather Helmet with Breathing Mask breathing Having exl
USA	Filed	10/368,020		Mar. 12, 2003		Cold-Weather Helmet with spring loaded sunshield
USA	Filed	10/386,021		Mar. 12, 2003		Cold-Weather Helmet with Spring Loaded Sunshield
USA	Filed	10/386,022		Mar. 12, 2003		Cold-Weather Helmet with transtucent eye shield
USA	Filed	10/386,023		Mar. 12, 2003		Cold-Weather Helmet with Breathing Mask breathing air from (
USA	Filed	10/388,026		Mar. 12, 2003		Breathing Mask Adjuster
USA	Filed	10/388,026		Mar. 12, 2003		Cold-Weather Helmet with Breathing Mask Pivoting Forward and
USA	Filed	10/400,909		Mar. 28, 2003		Hybrid Personal Watercraft
USA	Filed	10/412,274		Apr. 14, 2003		Stator Vane and Impeller-Drive Shaft Arrangements and Person
USA	Filed	10/422,820		Apr. 26, 2003		Suspension Assembly
USA	Filed	10/427,911		May 02, 2003		Convertible Personal Watercraft (barracuda)
USA	Filed	10/428,003		May 02 2003		Suspension Arm Arrangement for Straddle-Type All-Terrain Veh
USA	Filed	10/437,987		May 15, 2003		Air Intake System for Straddle-type All Terrain Vehicle
USA	Filed	10/442,182		May 21, 2003		Straddle Type ATV with Mechanical Actuated Brake System
USA	Filed	10/445,362		May 27, 2003		Vehicle Suspension for a Seat Thereof
USA	Filed	10/449,615		Jun. 02, 2003		Parking Gear Assembly For an ATV
USA	Filed	10/450,160		Jun. 11, 2003		Virtual Breaking System for Hydrostatically Driven Vehicle
USA	Filed	10/460,683		Jun. 13, 2003		Straddle-Type Mesh Seat
USA	Filed	10/608,075		Jun. 30, 2003		Snowmobile Slide Roll System
USA	Filed	10/609,405		Jul. 01, 2003		Side Panel for a snowmobile
USA	Filed	10/612,047		Jul. 03, 2003		Carburetor Heater for ATV (SC)
USA	Filed	10/617,354		Jul. 11, 2003		Variable venturi

APPENDIX A-continued

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
USA	Filed	10/834,911		Aug. 08, 2003		Front suspension with three bell joints for a vehicle
USA	Filed	10/634,912		Aug. 08, 2003		Wakeboard Pulling Apparatus
USA	Filed	10/634,913		Aug. 08, 2003		Watercraft Compensation System
USA	Filed	10/635,451		Aug. 07, 2003		Vehicle Track Providing Enhanced Stability
USA	Filed	10/635,930		Aug. 07, 2003		R3R Three Wheel Vehicle and Titable Steering Column Therefo
USA	Filed	10/636,917		Aug. 08, 2003		Drive Sprolcat for a Tracked Vehicle
USA	Filed	10/637,656		Aug. 11, 2003		Modular Headlight Structure for Vehicle and a Method for Man
USA	Filed	10/645,843		Aug. 22, 2003		R3R An Ergonomic Arrangement for a Three Wheel Vehicle
USA	Filed	10/647,779		Aug. 26, 2003		An All Terrain Vehicle with Passenger Seating Configuration
USA	Filed	10/647,781		Aug. 26, 2003		ATV with Passenger Seating Configuration
USA	Filed	10/647,782		Aug. 26, 2003		ATV with Driver and Passenger Seating
USA	Filed	10/647,786		Aug. 26, 2003		ATV with Rear Rack
USA	Filed	10/647,787		Aug. 26, 2003		An All Terrain Vehicle With Driver and Passenger Footrests
USA	Filed	10/655,597		Sep. 06, 2003		Convection Cooled Radiator for an ATV (SC)
USA	Filed			Oct. 20, 2003		Fuel Tank for ATV
USA	Filed	60/357,852		Feb. 21, 2002		Personal Watercraft Having a Removable Pedestral
USA	Filed	60/358,362		Feb. 22, 2002		R3R Components for a Three-Wheeled Vehicle to Permit Leaning
USA	Filed	80/358,364		Feb. 22, 2002		R3R Three Wheel Vehicle Having a Split Radiator and an Inter
USA	Filed	60/358,390		Feb. 22, 2002		R3R Frame Construction for a Three Wheel Vehicle
USA	Filed	60/358,397		Feb. 22, 2002		R3R Three Wheel Vehicle and Tiltable Steering Column Therefo
USA	Filed	60/358,398		Feb. 22, 2002		R3R Three Wheel Vehicle with a Continuously Variable Transmi
USA	Filed	60/358,399		Feb. 22, 2002		R3R Three Wheel Vehicle Having and Rear Suspension Therefor
USA	Filed	60/358,436		Feb. 22, 2002		R3R Three Wheel Vehicle and Concentric Intermediate Sprocket
USA	Filed	60/358,438		Feb. 22, 2002		R3R Three-Wheeled Vehicle and Fender Assembly Therefor
USA	Filed	60/358,737		Feb. 25, 2002		R3R Stability Parameters
USA	Filed	60/387,715		Mar. 28, 2002		Hybrid Personal Watercraft
USA	Filed	60/371,726		Apr. 12, 2002		Stator Vane and Impeller-Drive Shaft Arrangements and Person
USA	Filed	60/375,401		Apr. 26, 2002		Personal Watercraft having Off-Power Steering System
USA	Filed	60/375,715		Apr. 29, 2002		Fluid Reservoir
USA	Filed	60/376,842		May 02, 2002		Suspension Arm Arrangement for Straddle-Type All-Terrain Veh
USA	Filed	60/376,844		May Feb. 2002		Convertible Personal Watercraft (barracuda)
USA	Filed	60/380,291		May 15, 2002		Air Intake System for Straddle-type All Terrain Vehicle
USA	Filed	60/381,806		May 21, 2002		Straddle Type ATV with Mechanical Actuated Brake System
USA	Filed	60/382,032		May 22, 2002		Hydrostatic Motor Drive Mount
USA	Filed	60/382,607		May 24, 2002		Vehicle Suspension for a Seat Thereof
USA	Filed	60/384,174		May 31, 2002		Parking Gear Assembly For an ATV
USA	Filed	60/384,822		Jun. 04, 2002		ATV with Improved Driver Positioning and/or Multi Passenger
USA	Filed	60/391,060		Jun. 25, 2002		PWC Engine Control
USA	Filed	60/393,095		Jul. 03, 2002		Carburetor Heater for ATV (8C)
USA	Filed	60/393,114		Jul. 03, 2002		ATV with Improved Driver Positioning and/or Multi Passenger
USA	Filed	60/395,010		Jul. 11, 2002		Variable venturi
USA	Filed	60/401,012		Aug. 06, 2002		Watercraft Steering System
USA	Filed	60/401,013		Aug. 06, 2002		Watercraft Compensation System
USA	Filed	60/401,014		Aug. 06, 2002		Wakeboard Pulling Apparatus
USA	Filed	60/402,089		Aug. 09, 2002		Modular Headlight Structure for Vehicle and a Method For Man
USA	Filed	60/408,923		Aug. 30, 2002		Various Motorized Innovations
USA	Filed	60/407,939		Sep. 05, 2002		Convection Cooled Radiator for an ATV (SC)
USA	Filed	60/408,918		Sep. 09, 2002		Service Center for a Recreational Vehicle (MR)
USA	Filed	60/409,268		Sep. 10, 2002		Wet Suit with Removable Sleeves
USA	Filed	60/411,034		Sep. 17, 2002		All Terrain Vehicle and Rack Therefor

APPENDIX A-continued

Country Name	Status Description	Application Number	Patent Number	Application Date	Grant Date	Title
USA	Filed	60/412,607		Sep. 24, 2002		Straddle Type ATV with Mechanically or hydraulically Actuat
USA	Filed	60/416,534		Oct. 08, 2002		Level Wind Apparatus for use on a Snow Grooming vehicle
USA	Filed	60/418,355		Oct. 16, 2002		R3R Three Wheel Vehicle and Concentric Intermediate Sprocket
USA	Filed	60/419,106		Oct. 18, 2002		Fuel Tank for ATV
USA	Filed	60/419,995		Oct. 22, 2002		Snow Groomer Plow Assembly
USA	Filed	60/430,682		Dec. 04, 2002		Mobile electronic video game
USA	Filed	60/444,949		Feb. 05, 2003		Cvt/Rear Engine Mount
USA	Filed	60/444,959		Feb. 05, 2003		Articulated Drive Sprocket Member
USA	Filed	60/448,921		Feb. 24, 2003		R3R Three-Wheeled Vehicle Constructed According to Certain P
USA	Filed	60/462,498		Mar. 07, 2003		Removable And Retractable Passenger Seat For An ATV
USA	Filed	60/487,566		May 05, 2003		Modular Parts For An All Terrain Vehicle
USA	Filed	60/468,076		Jun. 08, 2003		Cover For An Object Subjected To An Airstream
USA	Filed	60/475,511		Jun. 04, 2003		ATV with Improved Driver Positioning and/or Multi Passenger
USA	Filed	60/477,359		Aug. 11, 2003		Snowmobile Cover
USA	Filed	60/479,469		Jun. 18, 2003		Snowmobile Pulley Cover
USA	Filed	60/484,288		Jul. 03, 2003		Snowmobile with a Rear Arrangement Suitable to Accept a Tran
USA	Filed	60/488,437		Jul. 21, 2003		Improved Snowmobile Suspension
USA	Filed	60/490,904		Jul. 30, 2003		Snowmobile Slide
USA	Filed	60/492,992		Aug. 07, 2003		Convertible Personal Watercraft
USA	Filed	60/493,001		Aug. 07, 2003		Adjustable Position Steering
USA	Filed	60/493,003		Aug. 07, 2003		Standing Surface Door For Stand-Up Personal Watercraft
USA	Filed	60/495,905		Aug. 22, 2003		Electronic Stability System on a Three-Wheeled Vehicle
USA	Filed	60/495,911		Aug. 22, 2003		Shock Absorber
USA	Filed	60/496,912		Aug. 22, 2003		Snow Removal Flap
USA	Filed	TBA		Dec. 05, 2003		A Methodology for the Design and Manufacture of a Family of
USA	Filed	60/472,733		May 23, 2003		Three Seat Snowmobile
USA	Filed	TBA		Nov. 24, 2003		Snowmobile Track Scraper
USA	Filed	60/409,601		Sep. 11, 2003		Onboard Communication System for a Recreational Vehicle
USA	Filed	60/499,455		Sep. 03, 2003		Chessis for Recreational Vehicle
USA	Filed	60/509,259		Oct. 06, 2003		Snowmobile Suspension Geometry
USA	Filed	TBA		Nov. 28, 2003		Modular Snowmobile Platform
USA	Filed	60/506,266		Oct. 06, 2003		Snowmobile Steering System
USA	Filed	TBA		Aug. 26, 2003		ATV with improved Driver Positioning
USA	Filed	10/847,785		Aug. 26, 2003		All Terrain with Specific Wheel Base
USA	Filed	10/847,780		Aug. 26, 2003		An All Terrain Vehicle with a Seat Backrest
USA	Filed	10/647,778		Aug. 26, 2003		An All Terrain Vehicle with Driver and Passenger Seating Con
USA	Filed	10/647,777		Aug. 26, 2003		ATV with Passenger Grab Handle
USA	Filed	TBA		Dec. 04, 2003		Mobile Electronic Video Game
USA	Filed	60/493,002		Aug. 07, 2003		Engine Cover With Air intake System For Watercraft
USA	Filed	10/467,451		Aug. 07, 2003		Systems and Methods for Automatic Carburetor Enrichment Durl
USA	Filed	TBA		Dec. 01, 2003		Latch
USA	Filed	60/496,918		Aug. 22, 2003		Modular Front Headlights for A Three-Wheeled Vehicle
USA	Filed	10/689,989		Oct. 22, 2003		Snow Groomer Flow Assembly
USA	Filed	TBA		Sep. 18, 2003		Kit To Transform a Tracked Vehicle To A Wheeled Vehicle
USA	Filed	10/564,062		Sep. 17, 2003		All Terrain Vehicle and Rack Therefor
USA	Filed	10/857,080		Sep. 09, 2003		Service Center for a Recreational Vehicle (MR)
USA	Filed	10/879,336		Oct. 08, 2003		Level Wind Apparatus for use on a Snow Grooming vehicle
USA	Filed	TBA		Nov. 25, 2003		Rear Fairing for a Snowmobile
USA	Filed	10/284,115		Oct. 31, 2002		Hydraulic Damping Device

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1. A snowmobile, comprising:

a frame including a tunnel;

an engine disposed on the frame;

a drive track disposed below the tunnel and connected operatively to the engine for propulsion of the snowmobile, the drive track having a plurality of profiles disposed thereon;

two skis disposed on the frame;

a seat disposed on the tunnel behind the engine; and

handlebars disposed on the frame forward of the seat, the handlebars being operatively connected to the skis for steering the snowmobile,

wherein each profile has a height of not less than about 1¼ inches; and

wherein the drive track has a length of 141 inches+/−1 inch.

2. A snowmobile as claimed in claim 1, wherein the height of each profile is between about 1½ and 2 inches.

3. A snowmobile as claimed in claim 1, wherein the height of each profile is between about 1¾ and 2 inches.

4. A snowmobile as claimed in claim 1, wherein the drive track has 56 pitches+/−2 pitches in its longitudinal direction.

5. A snowmobile as claimed in 1, wherein the ratio of length to width is not greater than 10.067+/−1.

6. A snowmobile as claimed in claim 1, wherein the ratio of length to width is between 9.6+/−1 and about 10.067+/−1.

7. A snowmobile, comprising:.

a frame including a tunnel;

an engine disposed on the frame;

a drive track disposed below the tunnel and connected operatively to the engine for propulsion of the snowmobile, the drive track having a plurality of profiles disposed thereon;

two skis disposed on the frame;

a seat disposed on the tunnel behind the engine; and

handlebars disposed on the frame forward of the seat, the handlebars being operatively connected to the skis for steering the snowmobile,

wherein each profile has a height of not less than about 1¼ inches; and

wherein the drive track has a length of 144 inches+/−1 inch.

8. A snowmobile as claimed in claim 7, wherein the height of each profile is between about 1½ and 2 inches.

9. A snowmobile as claimed in claim 7, wherein the height of each profile is between about 1¾ and 2 inches.

10. A snowmobile as claimed in claim 7, wherein the drive track has 56 pitches+/−2 pitches in its longitudinal direction.

11. A snowmobile as claimed in claim 7, wherein the ratio of length to width is not greater than 10.067+/−1.

12. A snowmobile as claimed in claim 7, wherein the ratio of length to width is between 9.6+/−1 and about 10.067+/−1.

13. A snowmobile, comprising:

a frame including a tunnel;

an engine disposed on the frame;

a drive track disposed below the tunnel and connected operatively to the engine for propulsion of the snowmobile, the drive track having a plurality of profiles disposed thereon;

two skis disposed on the frame;

a seat disposed on the tunnel behind the engine; and

handlebars disposed on the frame forward of the seat, the handlebars being operatively connected to the skis for steering the snowmobile,

wherein each profile has a height of not less than about 1¼ inches; and

wherein the drive track has a length of 151 inches+/−1 inch.

14. A snowmobile as claimed in claim 13, wherein the height of each profile is between 1½+/−0.25 and 2+/−0.25 inches.

15. A snowmobile as claimed in claim 13, wherein the height of each profile is between about 1¾+/−25 and 2+/−0.25 inches.

16. A snowmobile as claimed in claim 13, wherein the drive track has 56 pitches+/−2 pitches in its longitudinal direction.

17. A snowmobile as claimed in claim 13, wherein the ratio of length to width is not greater than 10.067+/−1.

18. A snowmobile as claimed in claim 13, wherein the ratio of length to width is between 9.6+/−1 and about 10.067+/−1.

* * * * *