

[54] SNOWLESS SKIS

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[52] U.S. Cl.280/7.13, 280/11.1 BT, 280/11.37 E, 280/11.37 P
[51] Int. Cl.A63c 17/18
[58] Field of Search.....280/11.1, 7.13, 11.19, 11.22, 280/11.27, 11.37 P, 11.37 E, 11.2; 301/5.3, 5.7

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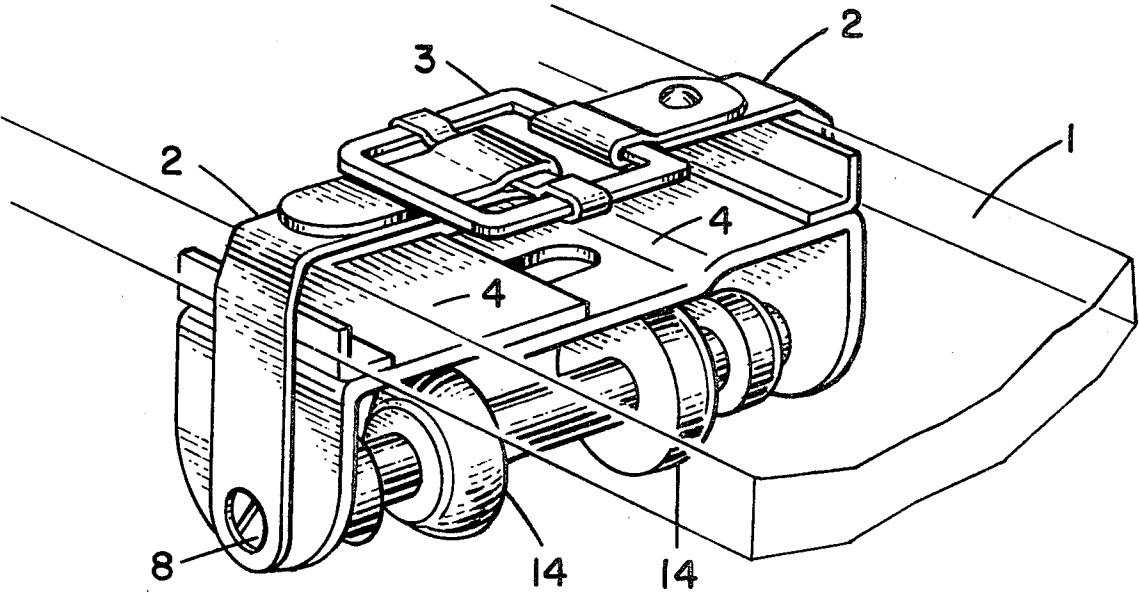
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[57] ABSTRACT

A ski fitted with a plurality of rollers for use in traversing a smooth solid surface devoid of snow or snow-like substance. The outer surface of rolling members is tapered to a smaller diameter than a diameter more inward. Preferably, the rolling surface is segmented. The tapered shape of the rollers provides a dynamic action similar to snow skiing with respect to turning, edging or stopping.

11 Claims, 7 Drawing Figures



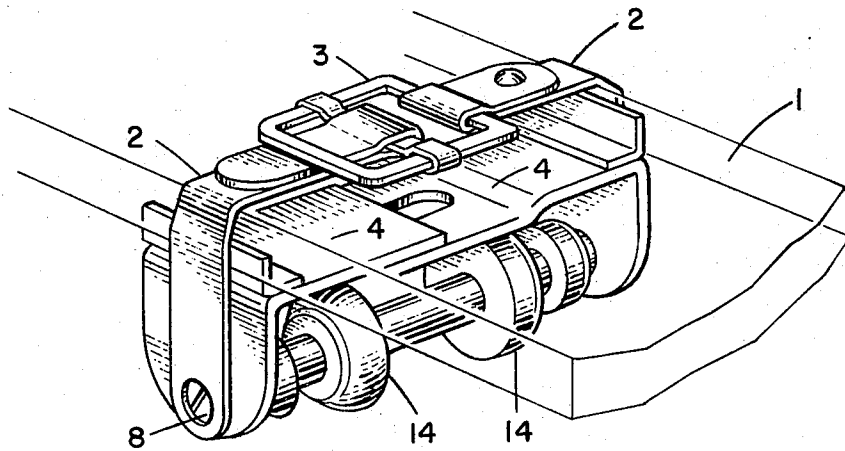


FIGURE 1

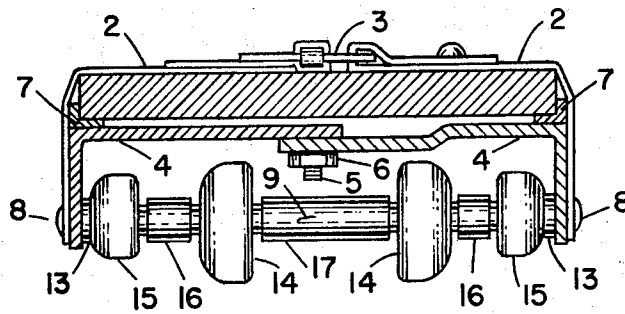


FIGURE 2

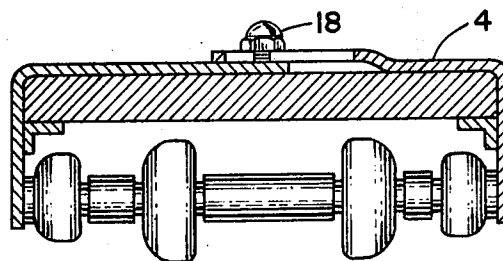


FIGURE 3

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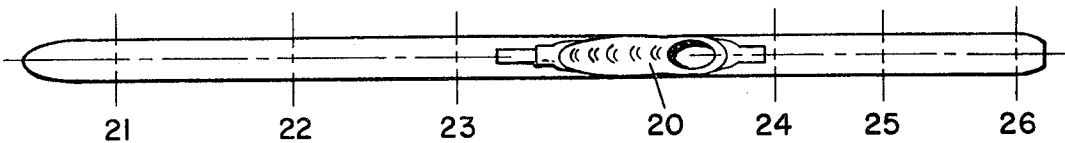


FIGURE 4

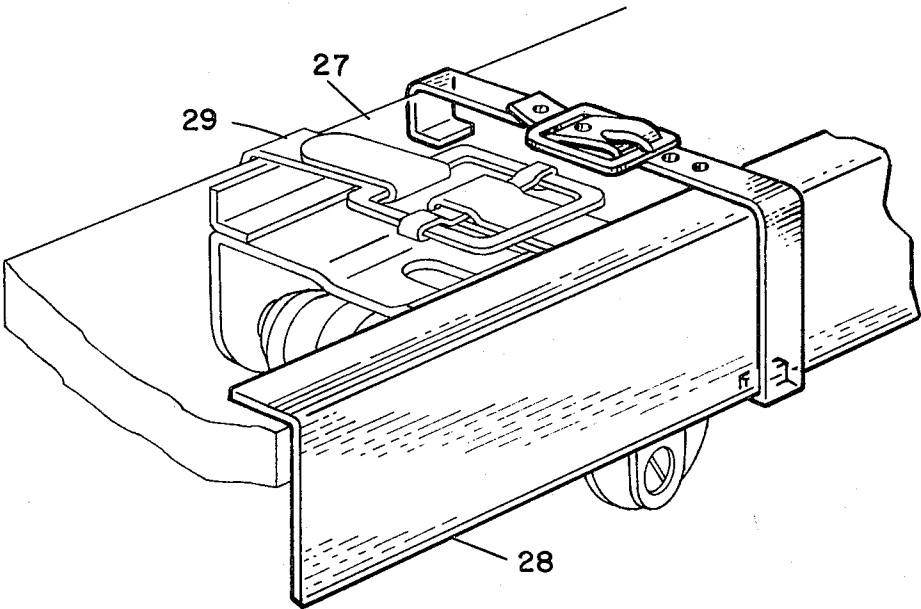


FIGURE 5

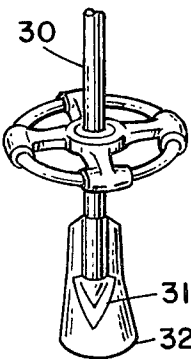


FIGURE 6

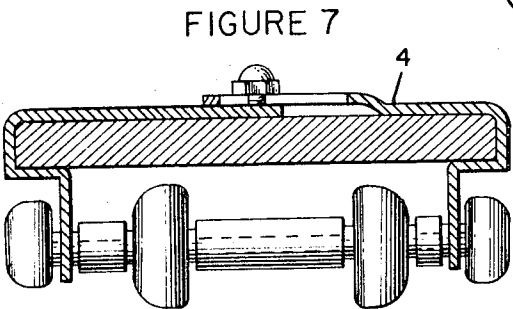


FIGURE 7

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SNOWLESS SKIS

BACKGROUND OF THE INVENTION

This invention pertains to means for adapting skis for use on snowless surfaces. More specifically, this invention pertains to snowless skis having attached to the underside thereof a plurality of roller assemblies which render skis useful in traversing smooth, snowless surfaces. Each of the roller assemblies comprises a rotatable rolling surface which supports the ski when in use, the rolling surfaces being substantially transverse to the longitudinal axis of the skis. The rolling surfaces are tapered such that the outermost surface thereof has a diameter less than a diameter more inward. Preferably, each rolling surface is segmented.

An object of this invention is to provide skis for use on snowless surfaces. Another object is to provide snowless skis which afford a dynamic action similar to snow skiing with respect to turning, edging, and stopping. Such objectives are met by the invention.

The art encompasses wheeled devices for attachment to the foot. In this regard, reference is made to roller skates, which are well known. One type of roller skate is described in U.S. Pat. No. 2,412,290. Moreover, the art comprises means for transforming snow vehicular devices to wheeled use. For example, wheel attachments for children's sleds are known; an exemplary attachment of this type is described in U.S. Pat. No. 2,885,214. Also, devices have been suggested for modifying skis for use on snowless surfaces. Thus, U.S. Pat. No. 2,260,027 describes a ski outfitted with endless or caterpillar belts. Moreover, roller assemblies have been attached to skis; U.S. Pat. No. 2,253,012. However, such modified skis leave much to be desired performance-wise, since they do not closely simulate the well known action and characteristics of snow skis.

In contrast to the prior art, the device of this invention provides participation in an athletic activity having similar sensations and requiring similar skills to snow skiing. Thus, this invention provides means for participation in a skiing sport where weather conditions preclude snow skiing. Likewise, it provides skiing activity — of a very authentic nature — in warm months of the year. In addition, it may stimulate interest and competence in skiing as well as provide training means for developing and improving snow skiing skills. With this invention, ski resorts and other accoutrements and accessories for snow skiing become of increased value, inasmuch as they can be used for a much greater fraction to all of a year.

These material benefits derive from the authentic type of skiing afforded by the devices of this invention. Such devices comprise rollers of design which provide such good dynamic action. So far as is known, rollers of this invention are not within the prior art.

SUMMARY OF THE INVENTION

As indicated above, this invention pertains to skis useful in traversing solid, smooth surfaces substantially uncovered by snow or snow-like substance, and the use of said skis. In other words, this invention pertains to means for affording skiing on land not covered by enough snow to allow snow-skiing. As such, this invention comprises

- a. roller assemblies for attachment to skis,
- b. skis fitted with such assemblies,
- c. ski poles for use therewith, and

d. prepared surfaces adapted to the use of said skis.

Thus, the invention pertains to use of a roller assembly for rendering a ski useful in traversing a solid surface not covered with snow or snow-like substance, said assembly comprising attaching means, a support member, and a rotatable rolling surface

- i. said attaching means holding said assembly to said ski,
- ii. said support member supporting said rotatable rolling surface underneath the underside of said ski such that said rolling surface is transverse to the longitudinal axis of said ski, and when said ski is in use, said ski is supported on said rotatable rolling surface,
- iii. the outer surfaces of said rotatable rolling surface being tapered to a smaller diameter than a diameter of said surface more inward from the longitudinal edges of said ski.

Another embodiment of this invention comprises a ski device suitable for traversing a solid surface substantially devoid of snow or snow-like substance — that is, a solid surface not having enough snow thereon to make snow skiing feasible — said device comprising an elongated ski, means for attaching said ski to the foot of the wearer, and a plurality of roller assemblies of the type defined above, said roller assemblies being positioned along said ski, to provide rollable support while said ski is in use, and optionally, the inner longitudinal edge of said ski having spacer means preventing interlocking of the skis by the wearer.

A third embodiment of this invention comprises means for modifying a standard ski pole for use with the aforementioned skis. Said modified pole comprises a shield insert for fitting over and housing the lower end of a snow ski pole such that the pointed tip of the standard pole is fitted therein, and a resilient shoe adapted for fitting over said insert, said shoe having an upper neck portion for receiving said insert therein, and a resilient bulbous sole portion.

The aforementioned devices are utilized on a smooth solid surface, smooth enough to provide a pleasurable traverse and sufficiently firm to support the wearer's weight as displaced upon the roller surfaces.

It will be apparent from the description herein that this invention can be utilized via skis particularly manufactured therefor and moreover, through simple modification of snow skis. Thus, by means provided by this invention, snow skis can be utilized year around: on snow 'in season' and by use of removable adaptations, later on when snow skiing is not possible.

DESCRIPTION OF THE DRAWINGS

The invention is illustrated by seven figures.

FIG. I, a perspective view of a roller assembly embodiment of this invention attached to a ski, the ski being shown in phantom outline,

FIG. II, a front view of the assembly shown in FIG. I,

FIG. III, a front view of another roller assembly embodiment of this invention,

FIG. IV, a top view of a ski of this invention showing positioning of rollers thereon,

FIG. V, a detail of a ski of this invention showing spacer means preventing interlocking of the skis,

FIG. VI, a ski pole for use with the skis of this invention, and

FIG. VII, a front view of a roller assembly with edge rollers outside support members supporting the roller assembly underneath a ski

DESCRIPTION OF PREFERRED EMBODIMENTS

As already indicated, this invention comprises a roller assembly for attachment to a ski. A preferred embodiment is illustrated in FIGS. I and II to which attention is directed. As can be seen, the device is attached to a ski 1 such that the rollers are substantially transverse to the longitudinal axis of the ski. In the device shown, the attaching means comprise straps 2 with lock-type buckle 3. Also, the attaching means comprise right and left hand brackets 4 which can be bonded by means of stud and lock nut 5 and 6 respectively. As illustrated, the straps lie upon the upper surface of the ski, while the horizontal surface of the bracket members lie contiguous to the underside of the ski. Some may prefer to protect the portions of the surfaces of the ski exposed to the attaching means. This may be accomplished by adhesive backed, rubber or felt surfaces (or the like) applied to the ski, the 'touching' surfaces of the attaching means, or both. These optional embodiments are not illustrated but are wholly within the expertise of a skilled artisan. As illustrated, the bracket members are firmed against the underside of the ski by angle supports 7 or other suitable abutting means. If desired, these may be suitably spot welded to the surfaces of the bracket members.

As illustrated, the combined span of the horizontal surfaces of the bracket members 4 is sufficient to enable the downwardly extending vertical surfaces of the bracket members to extend downwardly near the longitudinal edges of the ski. This span could be fixed, but it is preferred that the pair of brackets and elongated hole through which the stud is inserted — or some equivalent device — be used, to achieve the obvious benefits of adjustability.

As appreciated by a skilled practitioner, the combination of the adjustability of straps 2, and the positioning of the angle supports 7, will allow the roller assembly to be affixed no matter what the thickness of the ski at the point of attachment.

The length of the downwardly extending surface is not critical so long as it provides room for the rolling surface to rotate as desired. The length can be about an inch or two, but greater or lesser dimensions can be employed. For example, the length can be much elongated to provide a comic effect or appearance.

As illustrated, the strap is affixed alongside the outer edge of the bracket's vertical portion by means of holes to engage axle lock screws 8. The axle lock screws extend through holes in each bracket's vertical surfaces; the holes cooperate with axle 9. The axle supports the rolling surface. As illustrated, the axle is drilled and tapped to receive the axle lock screws. Spacer washers 13 can be provided to adjust axle length.

The roller surface in the device of FIG. I comprises two inner rollers 14 and two edge rollers 15 separated by sleeves 16 and 17. The edge rollers are contoured as shown such that the outer diameter is less than a diameter more inward. This tapered surface, akin to that of a frustoconical section, is of significant importance in providing a dynamic action similar to that when snow skiing as regards to turning, edging and stopping.

The edge rollers are preferentially fitted with oil-impregnated bearings. All rollers are preferentially made of a strong, heat dissipating material and are preferably metal, such as aluminum. The inner diameter of the edge roller is about the same as the outermost diameter of the inner rollers. There can be some difference in these diameters. By 'about the same' I mean the difference is not too great as to obviate cooperation between the roller surfaces when the skis are in use and especially when turning, edging, or stopping. Thus, for example, when an edge roller has about a $\frac{3}{8}$ inch length and a taper of diameter from about 0.625 inch to about 0.438 inch, I prefer to have inner rollers having an outermost diameter of about 0.750 inch, and about a 0.35 inch width. Such inner rollers preferably have a diameter at their innermost edge of about 0.875 inch.

It is to be understood that the above dimensions are for purposes of illustration only, and the invention is in no way limited to the dimensions given above. For example, although it is preferred that the inner rollers also taper to get smaller toward the outside as indicated by the above dimensions it is not necessary that they do so. Thus, there can be a grater taper or substantially none at all. Moreover, the inner rollers which define the center section may present a more or less crowned appearance when viewed transverse to the axle. Likewise, the taper of the edge rollers may be greater or less than that defined. In the same manner, the width of the rollers can be varied. Similarly, the number of rollers can be varied from one to about eight, ten or more. Likewise, the relative size and number of sleeves 16 and 17 can be varied to vary the relative positions of the rollers along the axle. Although for general skiing purposes, my invention preferably utilizes a configuration of rollers symmetrical about the center longitudinal axis of the skis, it is not necessary to do so. Likewise, there is no critical need for a plurality of rollers. One roller tapered on each edge will suffice and this roller can be segmented if desired. All that is required is the taper from a larger inner diameter to a smaller outer diameter. This taper at each end of the rolling surface provides the desired dynamic action.

Another embodiment of this invention is shown in front elevation in FIG. III. As devices such as those described above are preferred because of the absence of protruding devices on the upper surface of the ski and the ease of attachment no matter what the ski thickness, devices illustrated by FIG. III are preferred because of simplicity of design.

As illustrated, the device of FIG. III does not have a lock buckle or flexible straps of the above-described device. As illustrated, the device of FIG. III has right and left hand brackets 4, but in this device they overlay the top surface of the ski. As before, a width adjusting lock screw and adjusting slot is provided, one of this combination in each bracket. The brackets can be fastened by an acorn lock nut 18 as shown, or similar device. The downwardly extending portion of the substantially right angle brackets as well as the axle and roller assembly is about the same as in the device of FIGS. I and II. However, bracket supports 19 are used to firm the brackets against the underside of the ski.

FIG. IV is a top view of a ski of this invention outfitted with six roller assemblies illustrated in FIG. III. (A portion of another ski of this invention is shown in

perspective in FIG. 1). The boot and other accessories for attaching the ski to the foot of the wearer is shown by 20. At the positions indicated by 21-26 are the devices of FIG. III in plan view. The frontmost and rearmost positions are right before the ski has its upward curvatures at the front and back of the ski. In the ski illustrated there are the following dimensions:

Position	Ski Width	Ski Thickness
21	3 $\frac{3}{4}$ inches	$\frac{1}{4}$ inch
22	3 "	$\frac{1}{2}$ "
23	2 $\frac{13}{16}$ "	$\frac{1}{2}$ "
24	2 $\frac{3}{8}$ "	$\frac{7}{16}$ "
25	3 "	$\frac{5}{16}$ "
26	3 $\frac{1}{16}$ "	$\frac{1}{4}$ "

Through use of the width adjusting lock screw and width adjusting slot, the right and left hand brackets are adjusted such that the total span of the horizontal surfaces of the substantially right angled bracket members 4 is sufficient to enable the downwardly extending vertical surfaces of the brackets to extend downwardly near the longitudinal edges of the ski. Though not shown, the positions of the butting members, bracket supports 19, along the downward extending portions of the brackets is such that each roller assembly is firmed against the underside of the ski at the positions of attachment shown.

It is to be understood that the above dimensions are for purposes of illustration and other skis of this invention can have different dimensions. Also the relative position and number of roller assemblies illustrated is illustrative but non-limiting. These can be varied according to the desires of the wearer. Thus, more or less roller assemblies can be mounted along the same or different positions of the skis. In general, the mounting configurations should be sufficient to support the wearer, provide a suitable traverse, but not be such that desired speed or maneuverability is overly encumbered. Thus, even a single enthusiast may wish to vary the location and number of roller assemblies depending upon the type of terrain to be traversed and the type and condition of the surface.

To prevent the skis from interlocking, optionally one or both skis can be shrouded to more or less cover the wheels and other assemblies underneath the skis. This can be accomplished by mounting a shield along the inner-longitudinal surface of the ski (the 'inner' surface being that defined by the position of the skis as mounted on the feet of the wearer). This shield can be a strip of suitably hard material, preferably plastic, extending along the inner surface of the ski at essentially right angles thereto, and downwardly, in relation to the topside of the ski. For best results, relatively all of the inner surface will be so shrouded, but it is not essential that the shield extend to the verymost front and back of the skis. The shield can be a solid planar surface or it can be more or less screen-like so long as it has the necessary strength to prevent interlocking of the wheels should the skis come together. The shield can be attached in any convenient manner. Clamps can fit over the ski, or it can be made to engage with the axle lock screws of two or more roller assemblies. Such a shield is illustrated by FIG. V illustrating a section of a ski so fitted. In the Figure a portion of the ski is depicted as 27, the shield as 28, and a clamp extending over the ski as 29.

Ski poles can be used with the skis of this invention. In view of the solid surface, however, these are somewhat modified as compared to snow ski poles. Such modified poles have been mentioned above and FIG. VI illustrates such a modified pole suitable for use in the invention.

In the drawing, a conventional ski pole 30 is fitted with an insert over the tip thereof. The insert 31 which houses said tip prevents piercing of a resilient shoe 32. This shoe comprises a neck for inserting over the insert and lower end of the pole and has a bulbous sole.

Although any surface sufficiently hard to support the weight of the wearer when distributed over the rolling surfaces can be used, best skiing of this invention is provided by traversing a slope having a continuous surface. By continuous, I mean a surface substantially devoid of interruptions such as expansion cracks. The surface should be smooth to provide a pleasurable traverse. It is to be understood that surface joints can be within the ski surface. Experienced skiers utilizing skiing methods of this invention may wish to treat said surface or the rolling surfaces with a liquid film such as oil, water, or oil-in-water emulsion to reduce friction and provide more speed. Plastic coated, composite or thick semi-flexible plastic, or rubber, or rubber like surfaces can be well utilized.

It will be apparent from the above description and the drawings that many features can be modified without a departure from the spirit or scope of this invention. As an example, it is not necessary that there be but one rolling surface per roller assembly. Rather, it is an embodiment of this invention to have two or more rolling surfaces supported by support means such that they are tandem along the length of the ski. Thus, it can be envisioned that a ski of this invention can be equipped with one or a plurality of roller assemblies wherein one or more have tandem axles mounted transverse to the longitudinal axis of said ski.

It is also to be understood that additional embodiments are within the scope of this invention. For example, the axle can be modified into two threaded halves to allow length adjustment. Also, the sleeves over the axles can be replaced with rings such as Tru-arc rings. In addition, the roller assemblies of this invention can be modified to provide the edge roller (especially on the outboard of the ski) to be outside the support holding the axle. This will allow edging or tilting with lessened possibility of dragging or digging into the skiing surface. For this purpose, the supporting member holding the axle can be modified so the downward portion thereof is more inward than as shown in FIGS. 2 and 3. Moreover, especially when wooden skis are employed, a bracket member holding the axle can be fitted with slots or holes to allow screws or screw-type means to affix the member holding the axle into the undersurface of the ski. In such manner, permanently mounted roller assemblies using inexpensive laminated wooden skis made especially for roller use can be provided within the scope of this invention. The skiing surface can also be modified by applying a solution or slurry in oil, water, or oil-in-water emulsion of a detergent, soap, or wetting agent or combination thereof.

Having fully described the invention, I desire that this invention be limited solely by the scope and spirit of the claims which follow.

I CLAIM:

1. A roller assembly for rendering a ski useful in traversing a solid surface not covered with snow or snow-like substance, said assembly comprising a segmented rotatable rolling surface underneath the underside and transverse to the longitudinal axis of said ski, said rolling surface comprised of approximately two substantially equidiameter cylindrical center rollers, said center section being flanked on each side by edge rollers, each edge roller having an inner diameter about the same as the outermost diameters of said center section, each edge roller having an outer diameter nearer to the longitudinal edge of said ski smaller than said inner diameter, the segments of said rolling surface defined by said edge rollers tapering between said inner and outer diameters of said edge rollers.

2. A roller assembly of claim 1 wherein said center section is defined by two substantially equidiameter cylindrical rolling members spaced by a sleeve.

3. A roller assembly of claim 2 wherein each edge roller is substantially identical in size and configuration.

4. A ski device for traversing a solid surface, said device comprising an elongated ski, means for attaching said device to the foot of the wearer, a plurality of roller assemblies of claim 1 being positioned along said ski to provide rollable support when said ski is in use.

5. A ski device of claim 4 being further characterized in having snag preventing means mounted thereto, said snag preventing means comprising a downward extending shield mounted along the longitudinal inner surface, the longitudinal outer surface of said ski device being shield-free.

6. A roller assembly of claim 1 comprising four rotating rolling members, the position of said rolling members being maintained along said axle by spacing means, said spacing means being annularly mounted about said axle and between said rolling members.

7. A roller assembly of claim 6 wherein said spacing means comprises a sleeve.

8. A ski for traversing a solid surface comprising a roller assembly of claim 1.

9. A roller assembly of claim 1 wherein the outer surface of said rolling surface is defined by edge rollers, one edge roller being outside a support member supporting said rotatable surface underneath the underside of said ski.

10. A ski comprising a roller assembly of claim 9.

11. A roller assembly for attachment to a ski, and rendering said ski useful in traversing a solid surface not covered with snow or snow-like substance, said assembly comprising attaching means, a support member and a rotatable rolling surface,

i. said attaching means holding said assembly to said ski and comprising a pair of substantially right angled bracket members, each of said bracket members having a horizontal surface and a vertical surface extending downwardly from said horizontal surface, means for attaching said horizontal surfaces of said pair of bracket members such that the combined span of said horizontal surfaces is sufficient to enable said downwardly extending vertical surfaces to extend downwardly near the longitudinal edges of said ski at the site of attachment of said assembly, butting means on the inward side of each downwardly extending vertical surface cooperating with the underside of said ski at the site of attachment of said assembly,

ii. said support member supporting said rotatable rolling surface and comprising an axle and means for bonding said axle to said downwardly extending surfaces such that said axle is substantially transverse to the longitudinal axis of said ski and beneath the underside of said ski,

iii. said rotatable rolling surface being segmented and axially mounted around said axle, said rolling surface having a substantially cylindrical center section and being tapered such that each outermost diameter of said surface is smaller than a more inward diameter of said rolling surface.

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