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Description

Technical field

The present invention relates to a roller ski including a ski body mounted on a forward and a rear wheel, a binding or attachment for a ski shoe (boot) being arranged between the wheels, close to the rear wheel.

Background art

In skiing today, apart from the conventional poling and diagonal skiing, there is used to an ever-increasing extent so-called "ski-skating". This is reminiscent to a high degree of ordinary ice skating, and is either done by toeing out with the ski tips, so-called "herringboning", this technique mostly being used heretofore on upward slopes, or by toeing out with one ski only, resulting in that the other ski (hereinafter designated the "track ski") is kept in the track, the other ski (hereinafter designated "the skate ski") being toed out sideways, this manner of skiing being the one most prevalent of the two, and allowing the maintenance of greater speed with less effort than customary poling or diagonal skiing. This kind of skiing is most often done without so-called ground wax which also contributes to the ski working more lightly and quickly.

In snow skiing using single-sided toeing out of one ski, the track ski is down in the track or rut formed by earlier skiing and the transverse forces acting on the ski and urging it out transversely are entirely taken up by the edges of the rut.

In a corresponding manner of skiing with roller skis, the track ski is also affected by transverse forces steering it outwards, and it must be returned to the travelling direction using a technique not found in the present snow skiing technique.

In snow skiing with toeing out of one ski, the foot on the skate ski is put down as near as possible to the heel on the track ski, the skate ski then crossing over the track ski, which is possible since the track ski is down in the rut at a depth which is greater than the height of the ski.

With roller skis this crossover is impossible, and the difference between snow skiing will be greater the more the track ski is extended behind the shoe heel and the wider the skate ski is, due, for example, to the fact that the fork halves of the roller mountings on both sides of the roller must be added to the width of the roller.

In skiing with snow skis, customary in the technique in question, the skate ski base is angled to a considerable degree. If known roller skis are angled to the same amount, the roller fork mountings scrape against the ground, which means that the skier cannot train technically correctly and also that the fork mounting can dig into the ground and cause abrupt stoppage with a fall and a risk of injury.

It is attempted today, by such as the selection of materials, to make the roller skis in question as light as possible. Such a roller ski is described in DE—A—28 23 152. The roller ski comprises a ski body mounted on forward and rear wheels and it includes two parallel bars of solid cylindrical cross sections being connected with cross bracings and carrying a binding for the ski shoe close to the rear wheels. The known roller ski is a rather stiff construction for taking up vertical and horizontal forces.

Also other roller skis of today are dimensioned to completely take up both vertical and horizontal forces so that, for example, the positions of the wheels in the travelling direction will not be changed. They are often also implemented with a roll-back stop unnecessary for "ski skating" involving that wheel hub and shaft are made in strong steel. Altogether this makes the roller ski used at present about 3 times as heavy as the appropriate competition snow ski of today.

Disclosure of invention

The object of the present invention is therefore to solve the above-mentioned problem in the difference between skiing with snow skis and skiing with roller skis, and particularly with reference to ski skating.

This is achieved by the roller ski defined in claim 1.

By shaping the hollow section with a rectangular cross section with its short side downwards, the ski body will be laterally flexible for the skiing load. At the same time it supports mounting portions for the forward and rear wheels.

That the track ski in roller skiing tends to diverge is thus prevented by the carrying member being so slender in relation to horizontal forces that it flexes, the wheels then changing their attitude in relation to the straight line so that the roller ski steers inwards towards the direction from which the horizontal force comes. When the roller ski is not actuated on by horizontal forces it remains straight, of course, and goes straight forward like other known roller skis.

Since the carrying member is implemented such as to take up vertical forces to a greater extent than horizontal forces, it is suitable to use for it a rectangular hollow section with its short side downwards.

To prevent that the foot deck will not reinforce the carrying member and prevent its lateral deflection properties it is suitable to make cutouts in the areas of the deck not required for its intended purpose, thus solely forming a toe portion and a heel portion.

So that the skate ski may have its base tilted at a large angle to the horizontal and to enable it to be put down as near the shoe on the track ski as possible, the inventive roller ski has been formed with only a half fork mounting for each of the forward and rear wheels. In accordance with the invention the fork mountings of the roller ski are formed by the hollow section itself.

The lightness of the ski is enabled by using less material, since it does not need to be dimensioned for being straight when it takes up horizontal forces, and is intended to be laterally flexible, as well as not being provided in a basic embodi-

ment with a roll-back stop not necessary for skate skiing. The wheel hub can then be made in such as aluminium or plastics material. The wheel shaft can be implemented in lighter material, e.g. with a steel core for carrying and assembly.

Preferred embodiments

The present invention will now be described in detail below in connection with the preferred embodiments illustrated on the accompanying drawings, where

Figures 1 and 2 illustrate known skiing technique using ordinary skis on snow,

Figures 3 and 4 illustrate the same skiing technique using known roller skis,

Figures 5—7 again show the same skiing technique, but now using roller skis in accordance with the present invention,

Figures 8 and 9 illustrate in more detail what is characteristic for this skiing technique, on snow with ordinary skis and also on the ground using roller skis,

Figure 10 is a side view of a first embodiment of the inventive roller ski,

Figures 11 and 12 illustrate the roller ski according to Figure 10 seen from above,

Figure 13 illustrates a second embodiment of the inventive roller ski seen from above,

Figures 14—16 are sections A, B and C according to Figures 10 and 13,

Figure 17 is a detail of a preferred embodiment of the journalling shaft for the roller ski in accordance with the invention and

Figure 18 is a preferred embodiment of a wheel for the inventive roller ski.

When skiing on snow the skiers have more and more embraced a skiing style similar to ordinary ice-skating. This can be executed as one-sided toeing-out of the ski tip or toeing-out both skis. Figures 1 and 2 illustrate one-sided toeing-out on snow with ordinary skis, one ski, the track ski 1, following the track or rut 2 in the snow. The other ski, the skate ski 3, is put down behind the skier in ski-skating so that it crosses over the other ski, as will be seen from Figure 1. In Figure 8 it will be seen how this crossing of the skis 1 and 3 is possible when skiing on snow, due to the track ski 1 lying deep in the rut 2.

If this skiing style is transferred to roller skis of the kind known up to now, the situation illustrated in Figures 3 and 4 is obtained. Since known roller skis are relatively long, i.e. the binding is arranged at a good distance from the rear wheels, the skate ski 3 cannot be made to cross the "track" of the track ski 1, which is illustrated in Figure 3. Furthermore, known roller skis are so implemented that if the ski skating technique is used, the track ski 1 diverges from the track and forms an angle α to the travelling direction 2' in a manner illlustrated in Figure 4, and must be returned to the track by the skier. This return movement or force has no correspondence in the relevant snow skiing technique.

With roller skis implemented in accordance with the present invention, there is however obtained an action entirely corresponding to that carried out in the relevant snow skiing technique. The roller ski in accordance with the present invention, as will be more closely described in conjunction with Figures 10—13, is short and it has the binding or foot deck arranged in the immediate vicinity of the rear wheel. The roller skier can thus train and ski in exactly the same way as is applicable to skiing on snow, as will be noted by comparing Figures 5 and 7 with Figures 1 and 2. It will thus be seen from Figure 5 that the skate ski 3 can be moved crosswise behind the track ski 1, the travelling movement and the application of effort corresponding to what is applicable with the crossing ski movement according to Figure 1. This is also apparent from the comparison of Figure 9 with Figure 8.

The reason that the track ski 1 during skiing on roller skis in accordance with the present invention follows the direction of travel 2' without the skier needing to take any corrective movements is primarily due to the lateral flexibility of the ski, as is exaggeratedly indicated in Figure 6. The roller skis in accordance with the invention are namely formed to be laterally flexible. Another reason for the tracking property may be attributed to the journalling of the wheel and the implementation of the wheel.

In Figures 10—12, 14 and 15 there is illustrated a first embodiment of the roller ski in accordance with the present invention. The roller ski includes a ski body 10 mounted on a forward wheel 11 and a rear wheel 12. The ski body 10 comprises a hollow body with a rectangular cross section with its short side downwards, as will be seen from Figure 14. The hollow body thus has side walls 13 of greater extension than its upper and bottom walls 14, 15. With this hollow body shape and a well suited thickness for the selected material, which is suitably of the lightweight type such as aluminium or plastics (optionally reinforced plastics), a lateral flexing ability well balanced to the forces acting on the ski body 10 is obtained when skiing.

In this embodiment of the roller ski in accordance with the invention, the upper wall 14 of the hollow body is formed with a foot deck 16, 17. The foot deck 16, 17 is centered about the longitudinal axis 20 of the ski body 10, and has fastenings 18 for bindings for the ski shoe (not shown). The foot deck 16, 17 is arranged in the immediate vicinity of the rear wheel 12 and is further divided into a toe portion 16 and a heel portion 17, substantially for reducing the weight of the roller ski, but also so as not to constitute an obstacle to the above-mentioned lateral flexing ability.

The wheels 11, 12 are suspended by each a one-sided fork 19 being formed by the hollow body. In the embodiment illustrated in Figures 10—12 of the roller ski, the hollow body is joggled so that the forks 19 are parallel to the rest of the hollow body. The central axis of the wheels, which is at right angles to their axes of rotation, is thus in register with the longitudinal axis 20 of the ski body 10.

A second embodiment of the roller ski in accordance with the present invention is illustrated in Figures 13, 14 and 16. Elements which are the same as in the above-described first embodiment have been given the same reference numerals. The illustrated second embodiment of the roller ski in accordance with the invention has a foot deck 16', 17' starting from the upper wall 14 of the hollow body in only one direction as will be seen from Figure 16. The foot deck 16', 17', which is similarly divided into a toe portion 16' and a heel portion 17', thus has its longitudinal axis displaced parallel relative the longitudinal axis of the ski body in a direction towards the roller ski lying at its side in a roller ski pair.

With this arrangement of the foot deck 16', 17', the wheels 11, 12, the central axes of which are to be in register with the longitudinal axes of the foot deck 16', 17', are mounted in forks 19' which are parts of the hollow body, without the latter needing to be joggled. There is thus obtained a completely straight ski body 10, 19'.

Returning to Figure 12, it will be seen that this figure illustrates to an exaggerated scale how the track ski 1 (Fig. 6) flexes laterally under the action of the horizontal forces P occurring during skiing, thus causing the track ski to go straight.

An essential part of the invention for this maintenance of tracking would also be the suspension of the wheels 11, 12 in the extensions 19, 19' of the hollow body, these extensions having been termed fork mountings hereinbefore. Figure 17 illustrates the wheel shaft 21 made in a light material such as plastics or aluminium with a core 22, e.g. of steel. The core 22 has the form of a screw or bolt which consists of, or reinforces the carrying properties of the wheel shaft 21 as well as fastening it to the ski body 10. Through holes 33 have thus been made in the hollow section (the forks) side walls 13. The screw or bolt-like core 22 is taken through the holes 23 and into the hollow wheel shaft 21, which has an interior thread 24 coacting with a thread 25 on the core 22. The portion of the wheel shaft 21 facing towards one side wall 13 of the ski body 10 has a flange 26 of large diameter, forming a contact surface against the side wall 13 when the core 22 is threaded into the wheel shaft 21.

The wheel shaft 21 is intended to coact with a wheel 11 or 12. The hub of the wheel 11, 12 is formed as a rim 27, as will be seen from Figure 12. The rim 27 may be of plastics and form a relatively large inner cavity 28 in the wheel 11, 12 for keeping the weight of the wheel down. The rim 27 carries a tire or a tread 29 of suitable form and pattern for roller skis. The rim 27 is formed to carry ball or roller bearings 30 at the sides of the wheel 11, 12. These bearings 30 are mounted on the wheel shaft 21 and the wheel 11, 12 is fastened to the wheel shaft 21 with a spring clip (not shown) in the annular groove 31 at the end of the wheel shaft 21.

Claims

1. A roller ski comprising a ski body (10) mounted on forward and rear wheels (11, 12), a binding (16—18) for a ski shoe arranged between said forward and rear wheels close to the rear wheel (12), characterized in that the ski body (10) comprises a hollow section of a rectangular shape, the upper and lower walls (14, 15) of said hollow section being narrower than the width of a normal ski shoe, the side walls (13) having a greater extension than said upper and lower walls (14, 15), said hollow section supporting simultaneously at opposite ends mounting portions (19; 19') for the forward and rear wheels (11, 12), and the upper wall (14) having a foot deck (16, 17; 16', 17') intended for the ski shoe, which deck is as wide as the ski shoe and is formed integrally with the upper wall (14) of the hollow section.

2. The roller ski as claimed in claim 1, characterized in that the foot deck (16, 17; 16', 17') is divided into a toe portion (16, 16') and a heel portion (17, 17').

3. The roller ski as claimed in claim 1, characterized in that the foot deck (16, 17) is centered about the longitudinal axis (20) of the ski body (10), the hollow section being joggled at its ends to form said forks (19), which are excentric of, and parallel to the hollow section (Figure 11).

4. The roller ski as claimed in claim 2, characterized in that the foot deck (16', 17') extends from the upper wall (14) of the hollow section (10) in a direction towards the other roller ski of a pair of skis, the forward and rear wheels (11, 12) being mounted on the same side of the hollow section as the foot deck, said hollow section being substantially rectilinear.

5. The roller ski as claimed in claim 1, characterized in that in the side walls (13) of each of the forks (19; 19') formed by the hollow section (10) is a through hole (23) accommodating a core (22) for a hollow shaft (21) on which the respective forward and rear wheel (11, 12) is journalled.

6. The roller ski as claimed in claim 5, characterized in that the hollow shaft (21) is formed of a light-weight material such as aluminium or plastics and the core (22) fastened to the fork (19; 19') consists of steel in the form of a screw or bolt threaded into the hollow shaft, which has a female thread (24) for this purpose.

7. The roller ski as claimed in claim 6, characterized in that each forward or rear wheel (11, 12) includes a hub (27) formed with a rim, the hub carrying bearings (30) at the sides of the wheel for the hollow shaft (21) and between these bearings forms a cavity (28) inside the wheel, the periphery of the rim carrying a tire (29).

Patentansprüche

1. Rollski mit einem auf vorderen und hinteren Rädern (11, 12) angeordneten Skikörper (10) und einer zwischen den vorderen und hinteren Rädern nahe am hinteren Rad (12) angeordneten Bindung (16—18) für einen Skischuh, dadurch gekenn-

zeichnet, dass der Skikörper (10) eine hohle, rechteckförmige Sektion umfasst, deren oberen und unteren Wände (14), 15) enger sind als die Breite eines normalen Skischuhs und deren Seitenwände (13) sich länger erstrecken als die oberen und unteren Wände (14, 15), wobei die hohle Sektion geleichzeitig an entgegengesetzen Enden Befestigungsteile (19; 19') für die vorderen und hinteren Räder (11, 12) aufweist, und wobei die obere Wand (14) mit einer Fussplatte (16, 17; 16', 17') für den Skischuh versehen ist, deren Breite der Breite des Skischuhs entspricht und welche in einem Stück mit der oberen Wand (14) der hohlen Sektion ausgebildet ist.

2. Rollski nach Anspruch 1, dadurch gekennzeichnet, dass die Fussplatte (16, 17; 16', 17') in einen Zehteil (16, 16') und einen Fersenteil (17, 17') geteilt ist.

3. Rollski nach Anspruch 1, dadurch gekennzeichnet, dass die Fussplatte (16, 17) um die Längsachse (20) des Skikörpers (10) zentriert ist, wobei die hohle Sektion an ihren Enden gekröpft ist um Gabeln (19) zu bilden, die zu der hohlen Sektion exzentrisch sowie mit derselben parallell sind (Fig. 11).

4. Rollski nach Anspruch 2, dadurch gekennzeichnet, dass die Fussplatte (16', 17') sich von der oberen Wand (14) der hohlen Sektion (10) in einer Richtung auf das andere Rollski eines Skipaars erstreckt, wobei die vorderen und hinteren Räder (11, 12) auf derselben Seite der hohlen Sektion wie die Fussplatte gelagert sind und die hohle Sektion im wesentlichen geradlining ist.

5. Rollski nach Anspruch 1, dadurch gekennzeichnet, dass in den Seitenwänden (13) jeder der durch die hohle Sektion (10) gebildeten Gabeln (19; 19') ein durchgehendes Loch (23) vorgesehen ist, in dem ein Kern (22) einer Hohlachse (21) untergebracht ist, auf der das vordere bzw. hintere Rad (11, 12) gelagert ist.

6. Rollski nach Anspruch 5, dadurch gekennzeichnet, dass die Hohlachse (21) aus einem leichtgewichtigen Material, beispielsweise Aluminium oder Kunststoff besteht und der an der Gabel (19; 19') befestigte Kern (22) aus Stahl in Form einer Schraube oder eines Bolzens besteht, die bzw. der in die Hohlachse eingeschraubt ist, die ein hierfür vorgesehenes Innengewinde (24) aufweist.

7. Rollski nach Anspruch 6, dadurch gekennzeichnet, dass die vorderen bzw. hinteren Räder (11, 12) jeweils eine mit einem Felgen ausgebildete Nabe (27) aufweisen, wobei die Nabe an den Seiten des Rades für die Hohlachse (21) vorgesehene Lager (30) trägt, zwischen denen im Rad ein Hohlraum (28) gebildet ist, und wobei über den Umkreis des Felgens ein Reifen (29) angeordnet ist.

Revendications

1. Ski à roues comportant un corps de ski (10) monté sur des roues avant et arrière (11, 12), une fixation (16—18) pour une chaussure de ski montée entre lesdites roues avant et arrière et près de la roue arrière (12), caractérisé en ce que le corps de ski (10) comprend une section creuse de forme rectangulaire, les parois supérieure et inférieure (14, 15) de ladite section creuse étant plus étroites que la largeur d'une chaussure de ski normale, les parois latérales (13) ayant une extension supérieure aux dites parois supérieure et inférieure (14, 15), ladite section creuse supportant simultanément à des extrémités opposées des parties servant au montage (19; 19') des roues avant et arrière (11, 12), et la paroi supérieure (14) présentant une plate forme pour le pied (16, 17; 16', 17') prévue pour la chaussure de ski, laquelle plate forme est aussi large que la chaussure de ski et est faite d'un seul tenant avec la paroi supérieure (14) de la section creuse.

2. Ski à roues selon la revendication 1, caractérisé en ce que la plate forme pour le pied (16, 17; 16', 17') est divisée en une portion pour les doigts de pied (16, 16') et une portion pour le talon (17, 17').

3. Ski à roues selon la revendication 1, caractérisé en ce que la plate forme pour le pied (16, 17) est centrée autour de l'axe longitudinal (20) du corps de ski (10), la section creuse étant indentée à ses extrémités pour former lesdites fourches (19) excentriques par rapport à la section creuse et parallèles à celle-ci (figure 11).

4. Ski à roues selon la revendication 2, caractérisé en ce que la plate forme pour le pied (16', 17') s'étend depuis la paroi supérieure (14) de la section creuse (10) en direction de l'autre ski à roues d'une paire de skis, les roues avant et arrière (11, 12) étant montées sur le même côté de la section creuse que la plate forme pour le pied, ladite section creuse étant essentiellement rectiligne.

5. Ski à roues selon la revendication 1, caractérisé en ce que dans les parois latérales (13) de chacune des fourches (19; 19') formées par la section (10) creuse se trouve un trou débouchant (23) recevant un noyau (22) pour un arbre creux (21) servant d'essieu sur lequel sont supportées les roues avant et arrière correspondantes (11, 12).

6. Ski à roues selon la revendication 5, caractérisé en ce que l'arbre creux (21) est fait d'un matériau léger comme de l'aluminium ou du plastique et en ce que le noyau (22) fixé à la fourche (19; 19') se compose d'acier sous la forme d'une vis ou d'un écrou vissé dans l'arbre creux, qui est, pour ce faire, muni d'un filetage femelle (24).

7. Ski à roues selon la revendication 6, caractérisé en ce que chaque roue avant et arrière (11, 12) comprend un moyeu (27) présentant un rebord, le moyeu portant des paliers (30) sur les côtés de la roue pour un arbre creux (21), et en ce qu'une cavité (28) est formée entre ces paliers à l'intérieur de la roue, la périphérie du rebord portant un pneu (29).

Fig. 2

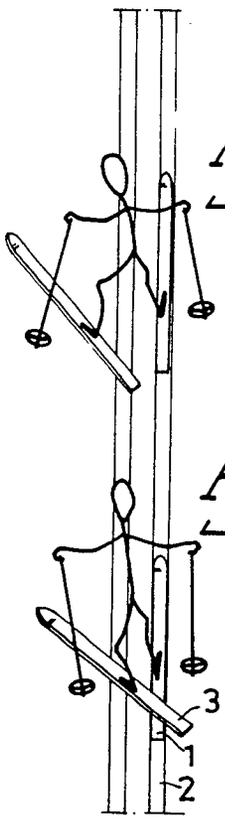


Fig. 1

Fig. 7



Fig. 6

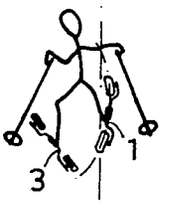


Fig. 5





Fig. 4



Fig. 3

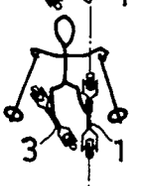


Fig. 8

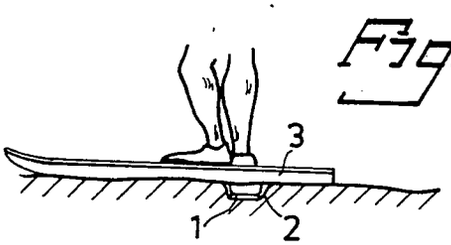


Fig. 9

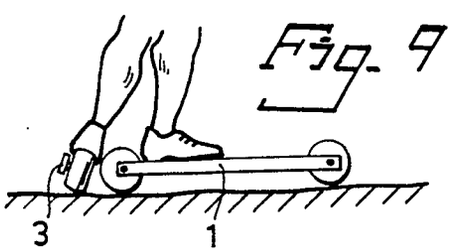


Fig. 10

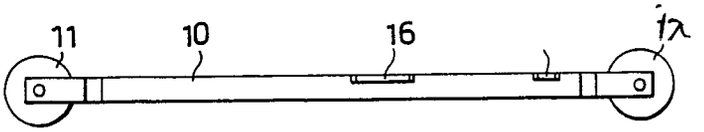


Fig. 11

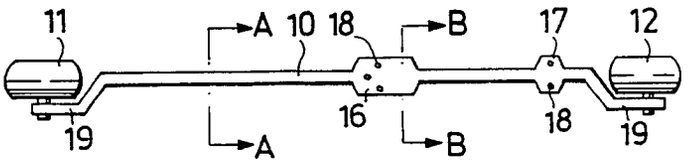


Fig. 12

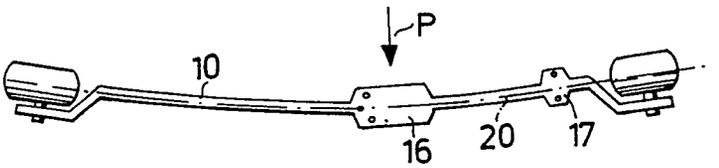


Fig. 13

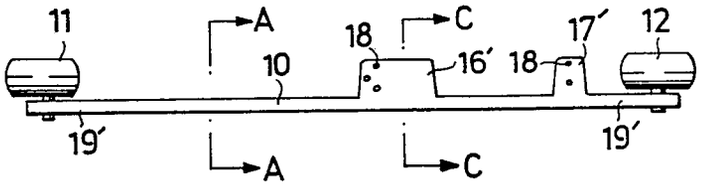


Fig. 14

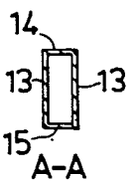


Fig. 15

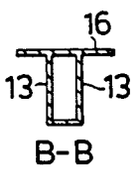


Fig. 16

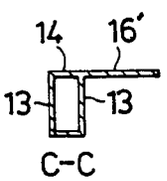


Fig. 17

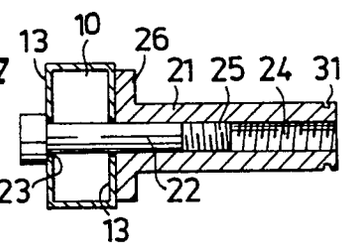


Fig. 18

