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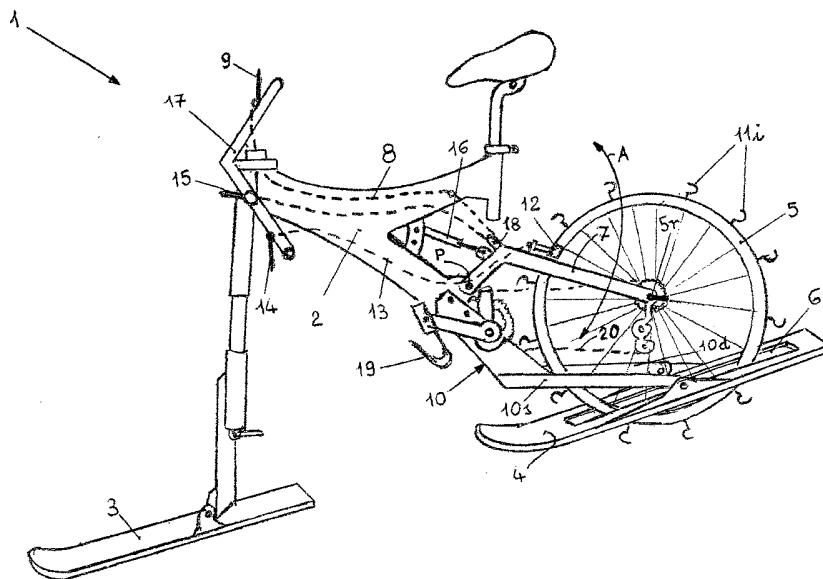
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(54) Title: SNOWBIKE



(57) Abstract: A description is given of a snowbike (1) comprising a frame (2), a front ski (3), a rear ski (4) and a rear drive wheel (5) connected to the said frame (2) and resting on the ground (T), in which snowbike the said drive wheel (5) is inserted perpendicularly through a slot (6) extending along the centre line of the said rear ski (4), in which slot it can rotate freely, and is connected to the frame (2) by an arm (7), hinged to the frame, that can be rotated with respect to the hinge point (P) by actuating means (8, 9) fitted to the said frame (2), in such a way as to lift the said drive wheel (5) off the ground (T).

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Snowbike

The present invention relates to snowbikes, that is bicycles fitted with runners or skis which by means of these members are able to travel freely over snow without sinking into it. In these bicycles, traction is provided by a drive wheel driven by pedals: this invention relates particularly to snowbikes fitted with a front ski, a rear ski and a drive wheel fitted to the rear.

Two examples of this type of snowbike are disclosed in patent US-A-4 828 280 (Kies) and in patent US-A-586 412 (Anderson): in both case the rear ski is mounted behind the drive wheel, a short distance behind the latter.

However, this arrangement of the drive wheel and the ski creates a serious problem: since the drive wheel encounters the irregularities of the snow surface before the rear ski, it is subject to impacts which cannot be softened by the presence of the rear ski. Also, when the wheel encounters areas where the snow is loose, it sinks deeply into the snow because of the fact that part of the weight of the bicycle is taken through the drive wheel itself and through the front runner only, and the front runner cannot have an effective lifting action because its dimensions are small in order to give it the desired powers of directionality. These various factors mean that a prior-art bike is difficult to use and rather tiring.

Also, since the drive wheel is fixed relative to the frame it has an undesired braking action on the bike on descents, thus limiting to an excessive degree the amount of pleasure that can be had from a high-speed descent.

The inventor of this invention has sought for a solution to the drawbacks described above, and has come

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up with a bike in which the drive wheel is mounted at the rear, in a position analogous to that of the rear wheels of conventional bicycles, but rests on the ground (or rather on the snow) after passing through a slot formed along the centre line of the rear ski. The assembly made up of the drive wheel and the rear ski thus encounters irregularities and soft areas as a single unit, and the drive wheel is supported by the rear ski which, being the first to encounter them, exerts an appropriate supporting action made possible by its large surface area.

The invention has also provided that, in the snowbike of his invention, the rear wheel is connected to the frame in such a way that it is able to rotate with respect to the frame, separating itself from the ground in response to the actuation of suitable means, which will be described later, fixed to the said frame. This arrangement makes it possible to achieve maximum speed when desired during a descent.

The subject of the present invention is therefore a snowbike as disclosed in the appended Claim 1. A more detailed description will now be given of a preferred illustrative example, with reference also to the appended figure, which shows it in a perspective view.

As the figure shows, in a snowbike 1 according to the invention, a mountain bike-type frame 2 is fitted with a front ski 3, which replaces the front wheel, and a rear ski 4, which has a longitudinal slot 6 along its centre line, with the lower part of a rear drive wheel 5 projecting through it. The wheel contacts the ground after passing through the abovementioned slot 6, the dimensions of which are of course such that its edges do not interfere with the said drive wheel 5 and thus allow it to move freely.

The said rear ski 4 is mounted to the frame 2 via a

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fork 10 with two blades 10d, 10s connected to the two opposite sides of the rear ski 4.

5 The drive wheel 5 is attached by its axle 5r to the free end of an arm 7 whose other end is hinged about a point P on the frame 2 so as to be able to rotate about it (arrow A). The drive wheel 5 is held down against the ground T by an elastic member 16, which in this particular case is a spring moving in a cylindrical sleeve (a known technique, already adopted on
10 conventional mountain bikes).

The arm 7 is also provided with means which, when actuated, overcome the resistance of the said elastic
15 member 16 and rotate it (in the anticlockwise direction in the figure) so that the drive wheel 5 is lifted off the ground T.

In the case described here, these means consist of a
20 cable 8 mounted on the frame 2 with one end connected to the said arm 7 and the other to a lever 9 mounted on the handlebar 17, of the type currently used for operating the brakes of a conventional bicycle.

25 By operating the lever 9 it is thus possible to raise the said drive wheel 5 as stated: according to the invention another lever 15 can be mounted on the handlebar 17 to which in this case the free end of the said cable 8 can be attached to adjust the tension in
30 the cable. Clearly, in order to be able to implement this arrangement, the cable 8 must be connected to the frame 2 through a hole or slot 18 through which it is fed back to the abovementioned other lever 15, or be fed around a small pulley (this solution is not shown
35 in the drawing) whose spindle is mounted in the same position as the said hole or slot 18. The figure shows this latter version: to visualize the simpler version described earlier, that is without the extra lever 15, the latter may simply be pictured as being absent and

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the free end of the cable 8 attached to the said hole or slot 18.

5 According to the invention, the drive wheel 5 of the type described thus far is fitted with a conventional friction brake system essentially consisting of two pads 12 acting on the rim and operated by a lever 14 mounted on the handlebar 17 and connected to the said two pads 12 by a cable 13.

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In order to improve the grip of the drive wheel 5, which is driven by conventional pedals 19 connected to the wheel by a chain 20, the inventor suggests mounting on its outer surface, which comes into contact with the snow, a plurality of grip means consisting of hook-shaped studs 11i as shown in the figure.

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A snowbike 1 produced in accordance with the present invention is safer and easier to use and allows the slope of the ground to be used to maximum effect to build up greater speed, thus achieving all the inventor's intended objects.

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It should be pointed out that a snowbike according to the invention can also be made by fitting to a normal mountain bike frame 2 with a kit consisting of the front and rear skis 3 and 4, mounted as stated to the frame 2, and the drive wheel 5 with the associated arm 7 which supports it and which is able to rotate. By attaching and/or connecting the various cables in some convenient way to the corresponding parts which they operate, it is therefore possible to convert, for a modest outlay, a conventional mountain bike into the snowbike of the invention.

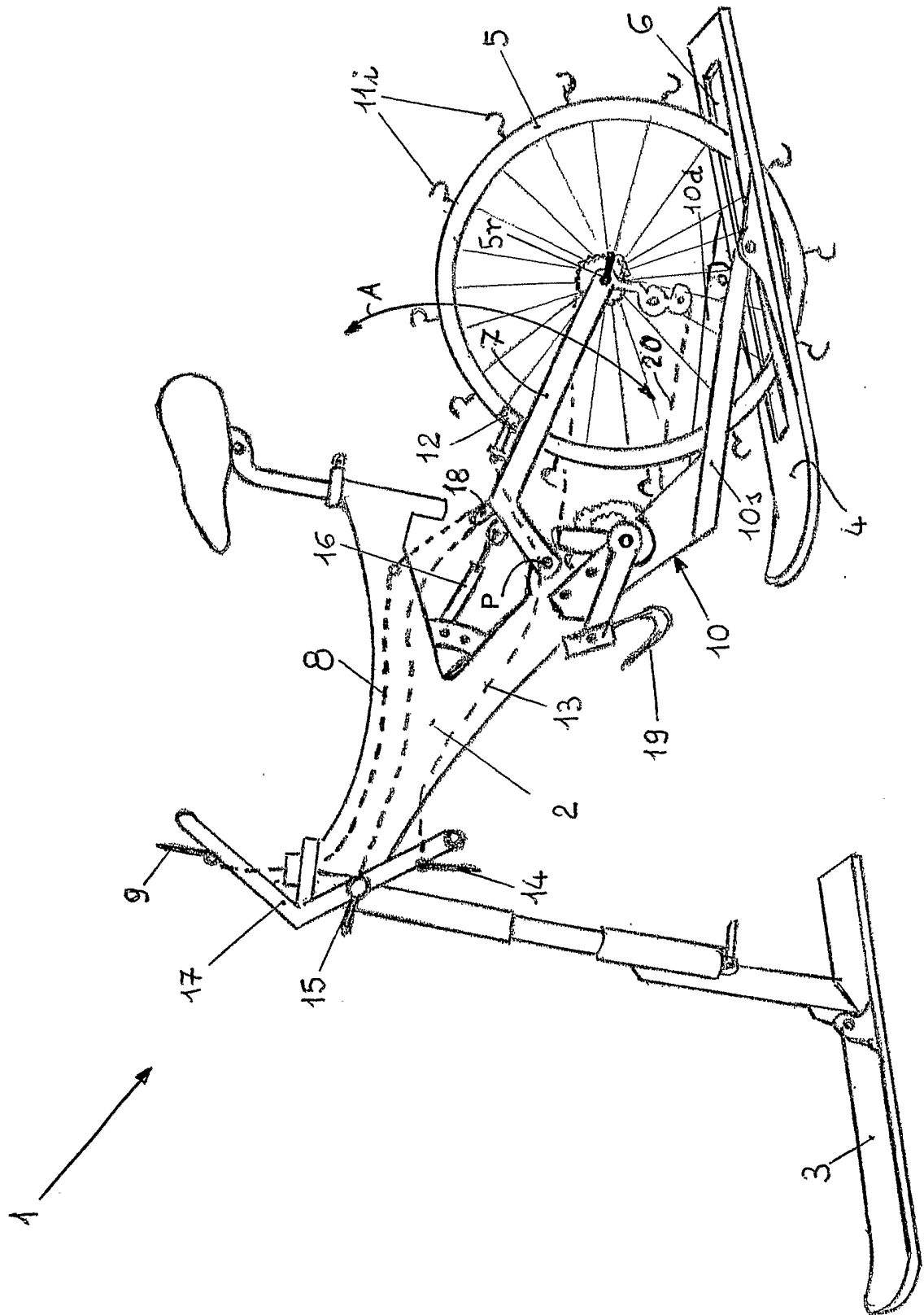
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Claims

1. Snowbike (1) comprising a frame (2), a front ski (3), a rear ski (4) and a rear drive wheel (5) connected to the said frame (2) and resting on the ground (T), the snowbike being characterized in that the said drive wheel (5) is inserted perpendicularly through a slot (6) extending along the centre line of the said rear ski (4), in which slot it can rotate freely, and is connected to the frame (2) by an arm (7), hinged to the frame, that can be rotated with respect to the hinge point (P) by actuating means (8, 9) fitted to the said frame (2), in such a way as to lift the said drive wheel (5) off the ground (T).
2. Snowbike according to Claim 1, in which there is interposed, between the said arm (7) and the frame (2) to which it is hinged, at least one elastic member (16) designed to keep the drive wheel (5) pressed against the ground (T) when the said means (8, 9) for rotating the arm (7) about its hinge point are not actuated.
3. Snowbike according to either of the previous claims, in which there are attached to the outer surface of the drive wheel (5) that comes into contact with the ground (T) a plurality of grip members consisting of hook-shaped studs (11i).
4. Snowbike according to one of the previous claims, in which the said drive wheel (5) is provided with a friction brake system (12, 13, 14).



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A. CLASSIFICATION OF SUBJECT MATTER		
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B. FIELDS SEARCHED		
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 43 40 479 A (CZORNIK JUERGEN DIPL IND DESIG) 1 June 1995 (1995-06-01) column 1, line 48 -column 2, line 20; figures 1,3	1-4
Y	US 504 625 A (J. SCHMID) 5 September 1893 (1893-09-05) page 2, line 2 -page 2, line 7 page 2, line 54 -page 2, line 60; figures	1-4
Y	US 1 391 506 A (RILEY JOHN H) 20 September 1921 (1921-09-20) the whole document	3
Y	US 469 227 A (W. G. BOUSE) 23 February 1892 (1892-02-23) the whole document	2
<input type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
° Special categories of cited documents :		
A document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed		*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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