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(54) **SKI TRAINER**

(57) A construction of the ski trainer according to the invention allows simulation of a presence of centrifugal force that occurs when skiing at high speed.

The ski trainer has a frame body (1) and a base (2) with an arched track (3), allowing movement of a trolley (4) thereon, the trolley having a platform (5) rotatably attached thereto and equipped with two parallel pivotally mounted foot cradles (6), the trainer being equipped with a user supporting harness system (7) for simulation of centrifugal force. The foot cradles (6) at the front and at the rear are equipped with horizontal rods (10) slidably and pivotably mounted in the through holes (12) of the support frames (13) attached to the platform (5).

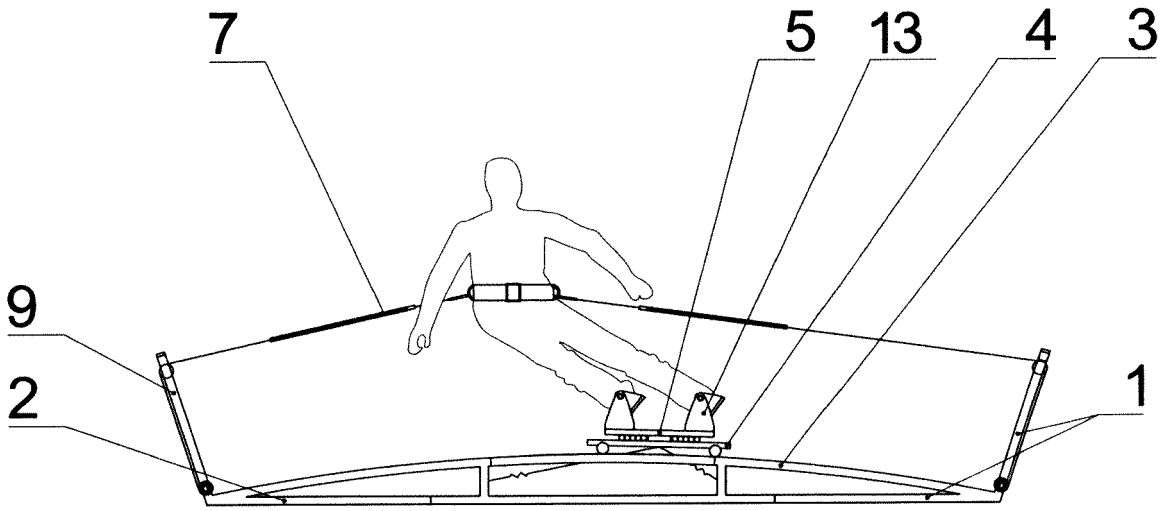

Fig.1

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Description

[0001] The subject matter of the invention is a ski trainer (ski training simulator) provided especially for use by individuals, allowing imitation of the skier's movements during actual turns on the skiing slope.

[0002] During a downhill skiing, a skier performing a turn must adopt a position in which the force resultant of gravity and centrifugal forces, passes through a surface of snow supporting the skis, which often makes it necessary to lean the skier's body extremely towards the centre of the turn and to generate very large muscular force to balance the external forces affecting his body. Simulation of skiing on known ski trainer devices, does not allow sufficient leaning of a torso and maintaining the position over the time as being characteristic for ski turns performed at high speed and larger radius; therefore, users' muscles engaged in performing such turns work in a way far different from that occurring at high speed skiing. It is not possible to develop therein a muscle strength up to the values present during real skiing; also the distribution of muscle strength over the time does not reflect real skiing conditions. Theoretically speaking, when using existing simulators of this kind, the types of muscle contractions trained are different to those performed during real skiing despite similarly looking external structure of movements.

[0003] From the Polish patent No. PL 222648, a ski training simulator for the purpose is known which comprises a base equipped with two parallel curved tracks of U-shaped or V-shaped cross-sections, and a railing connected thereto, with a trolley placed on the tracks. The trolley has two foot cradles equipped with mandrel protrusions for their swinging attachment, which cradles are placed transversely to the direction of trolley's movement. At the top, the trolley is equipped with a pantograph frame in form of a parallelogram. In the corners of the frame its arms are pivotally connected - in a horizontal plane, to each other, whereas the two opposite pantograph frame arms arranged transversely to the direction of the trolley's movement are pivotally connected to the trolley's base. To the two opposite pantograph frame arms arranged longitudinally to the direction of trolley's movement the foot cradles are mounted by means of angled sleeve-pin elements allowing two degrees of freedom.

[0004] A ski simulator known from the Polish patent application No. PL 312283, has skis pendulously attached to a trolley. The trolley is rotatably mounted on a slope base by means of an axle and is supported by rollers moving along an arched guide, wherein the trolley has a bar to which the axle is attached and elastic elements are fastened by means of quick-release clamps and lines threaded through pulleys.

[0005] From the US patent No. US 3912260 a skiing simulator is known, which has a base plate with a rotary table rotatably mounted thereto. The turntable contains two spaced apart vertical legs and between them there is a pivotally mounted swingarm. A cradle supports a trolley, which is movable along the length of the swingarm, as the swingarm rotates. Attached to the trolley and carried by it, there is a ski mounting device. The simulator is equipped with safety harness, that is attached around the user and connected by straps to the legs of the simulator.

[0006] A snowboard trainer device is known from the international patent application brochure No. WO 2016/205463, which has a platform, sliding rail, sliding guides, basic support and front interface. The sliding rail extends from the first end to the second end. The sliding supports connect the sliding rail and the platform. The sliding supports are configured to support the sliding rail against the platform. The central base is placed in relation to the slider on the platform and positioned between the first and the second ends of the sliding rail. The trainer has a supporting line helping the user to keep the balance, and a return supporting string. In some embodiments the trainer may have a harness system to support the user.

[0007] The aim of the invention is to develop a construction of a ski trainer that allows simulation of centrifugal force that occurs when skiing at high speed.

[0008] According to the present invention the ski trainer - having a frame base with an arched track allowing movement of a trolley thereon, the trolley having a platform rotatably attached thereto and equipped with two parallel pivotally mounted foot cradles, the trainer being further equipped with a user supporting harness system attached through a belt to the trainer frame, is characterized by that the foot cradles at the front and at the rear are equipped with rods arranged on a common axis and slidably mounted in the through holes of the U-shaped support frames attached to the platform. The harness includes of two resilient fasteners for simulating centrifugal force, the fasteners being attached to the frame base at the same level, ranging from 40 ÷ 60 cm above the position of the cradles.

[0009] The solution according to the invention allows for simulation of a movement structure similar to that occurring when skiing, and also for adopting extreme body tilts that occur when skiing at high speed. Moreover, a proper/adequate attachment of a user to the frame base of the ski trainer, such that the position of the resilient fasteners during the exercises is close to a horizontal position, enables the users to generate maximum muscular strength of the legs and in response to the simulated centrifugal force - to generate the types of muscular contractions significantly similar to those occurring in natural conditions.

[0010] The subject matter of the invention is presented in an embodiment shown schematically in the drawing, where Fig. **1** is a front view of the ski trainer, Fig. **2** is a top view of the ski trainer and Fig. **3** is a side view of the ski trainer.

[0011] The ski trainer has a frame body 1 and a base 2 with an arched track 3, allowing movement of a trolley

4 thereon, the trolley 4 has a platform 5 rotatably attached thereto and is equipped with two parallel foot cradles 6. The trainer is further equipped with a user supporting harness system 7 attached to a belt and to the arms 9 of the trainer body 1. The foot cradles 6 have at the front and at the rear horizontal rods 10 arranged on a common axis, which rods are slidably and pivotally mounted through a linear bearing 11 in the through holes 12 of the U-shaped support frames 13 attached to the platform 5. The user's harness 7 comprise two resilient fasteners symmetrically attached to the arms 9 of the body 1, at a level of 50 cm above the position of the cradles 6.

[0012] In order to facilitate the gradual teaching of movement technique and performing muscular strength training, the ski trainer offers an option, not presented in the description, to adjust the range of movements at individual degrees of freedom, i.e. forward and backward, vertical axis turns and sideway movements in the front plane.

Claims

1. A ski trainer - having a frame body with an arched track allowing movement of a trolley thereon, the trolley having a platform rotatably attached thereto and equipped with two parallel pivotally mounted foot cradles, the trainer being further equipped with a user supporting harness system attached to a belt and to the trainer frame, **characterized in that** the foot cradles (6) at the front and at the rear are equipped with rods (10) arranged on a common axis and slidably mounted in the through holes (12) of the U-shaped support frames (13) attached to the platform (5), while the harness (7) comprise two resilient fasteners attached to the base (2) of the body (1) at the same level, ranging from 40 ÷ 60 cm above the position of the cradles (6).

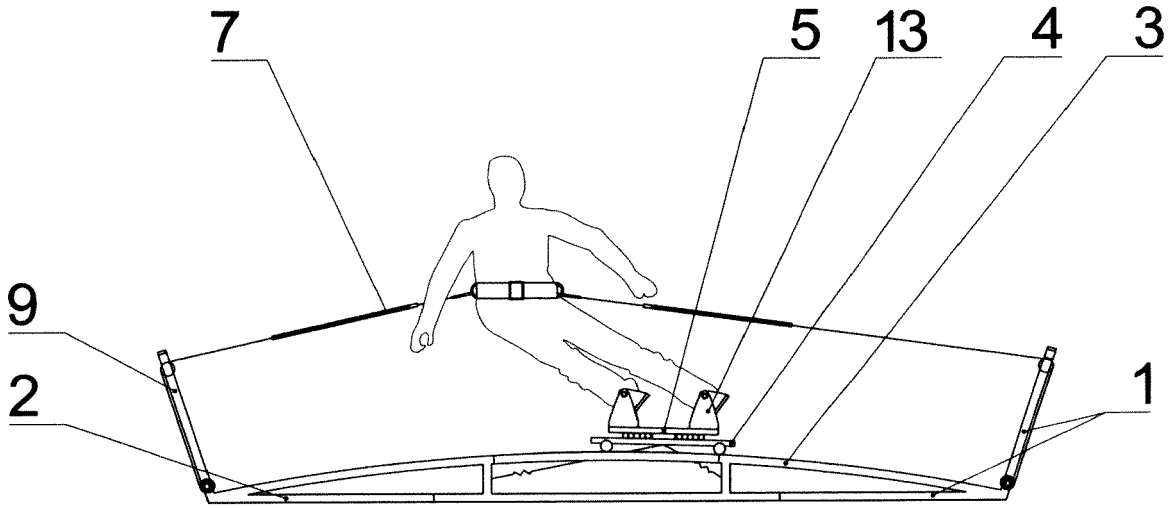

Fig.1

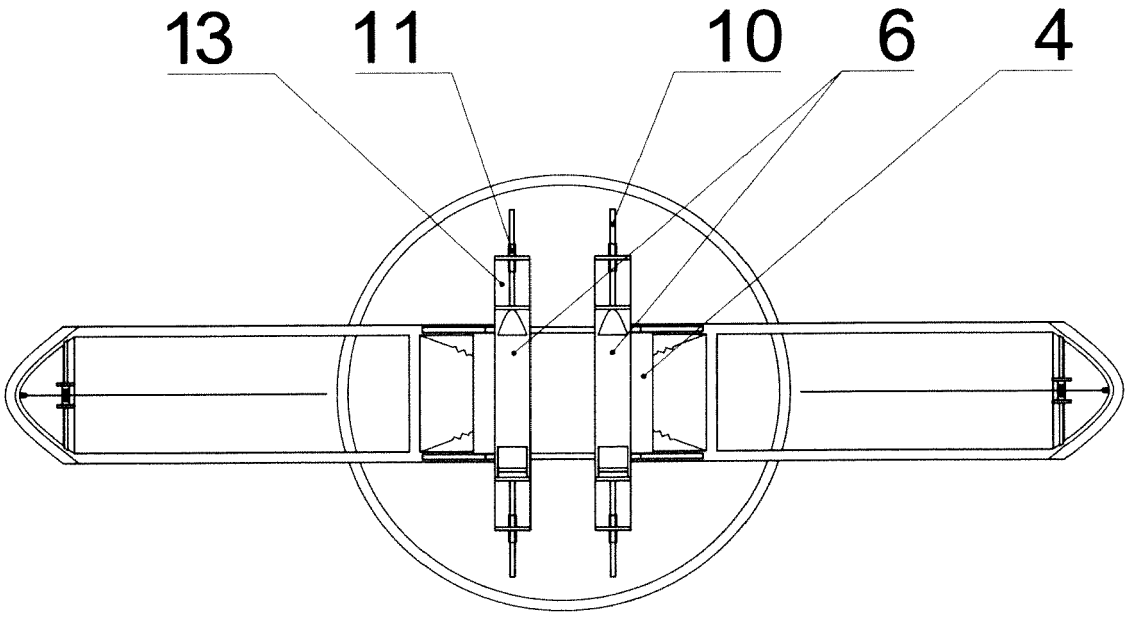

Fig.2

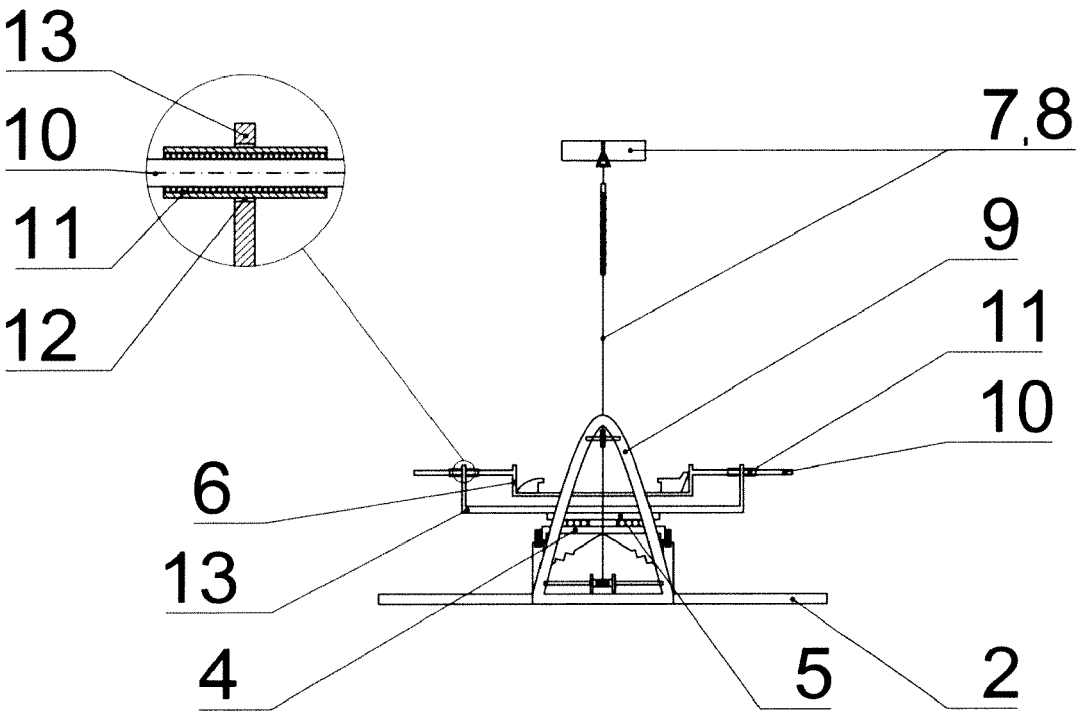

Fig.3

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EUROPEAN SEARCH REPORT

Application Number
EP 19 46 0058

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2009/176631 A1 (BLESSING DANIEL JOSEPH [US]) 9 July 2009 (2009-07-09) * paragraphs [0038] - [0065]; figures *	1	INV. A63B69/18 A63B69/00
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TECHNICAL FIELDS SEARCHED (IPC)

A63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 May 2020	Herry, Manuel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 46 0058

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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04-05-2020

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- PL 222648 **[0003]**
- PL 312283 **[0004]**
- US 3912260 A **[0005]**
- WO 2016205463 A **[0006]**