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(54) EQUIPMENT FOR FLIP TURN LEARNING IN SWIMMING LESSONS

(57) Equipment for flip turn learning in swimming lessons, according to the invention, consists mainly of a parallelepipedic panel (1), which is immersed in the pool at the end of the athlete's flip turn zone and which contains at the bottom the impact area (2), equipped internal with a force sensor (3), and a light source (4), connected to a command and control microsystem (5), together with the presence sensor (6) used to detect the presence of the swimmer and provide information at the time the return procedure must be started.

The abstract of the invention will be published together with figure 1.

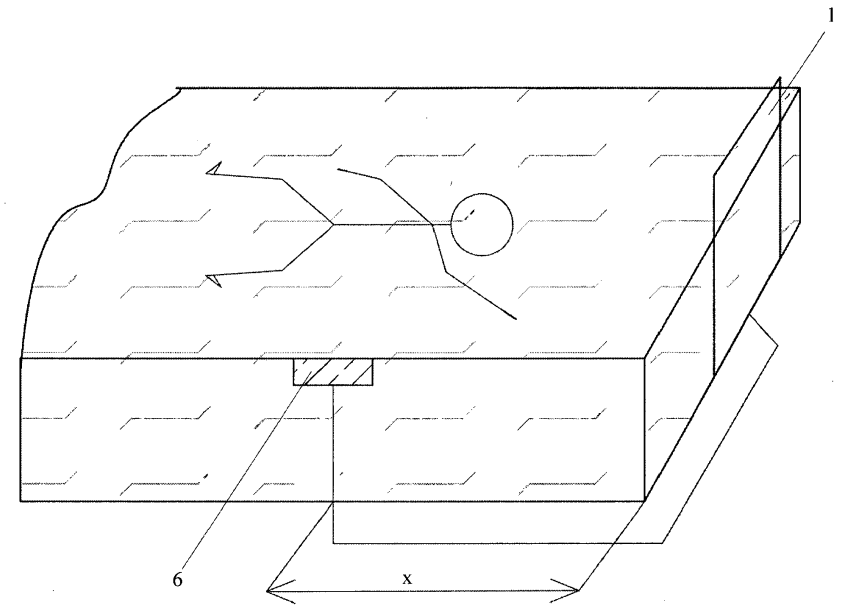

Fig. 1

EP 3 868 451 A1

Description

[0001] The invention relates to a system used in swimming training to practice and learn correctly the procedure of flip turn to the end of the pool, made on the basis of an immersed panel containing sensors and optical stimuli.

[0002] For the purpose of practicing and learning correctly the return procedures at the end of the pool is used direct observation of the trainer who based on experience gives tips for correcting the technique and are known a number of devices used in learning swimming but which are ineffective in the procedure of returning to the end of the pool (D. E. RYLAND. *Systems and methods for developing correct mechanics of a swimming flip turn.* Patent no. US7377784 B2, 27.05.2008), which consists mainly of a device that optimizes the teaching and learning of the return procedure by tactile feedback and spatial orientation during exercises.

[0003] The disadvantages of the existing solution are that the equipment cannot be adjusted according to the configuration and performance of the swimmer and does not provide measured data to provide information on the performance obtained after learning and repeating movements.

[0004] The technical problem solved by the invention consists in the use of an equipment that gives the athlete information on the moment when the return procedure should be started and on the place where the propulsion stroke should be performed, and on the other hand it provides information about the correctness of movement and the evolution of learning through data related to strength and speed, simultaneously with the possibility of adjusting and configuring the position of the equipment depending on the configuration and performance of the learner.

[0005] The equipment for flip turn learning in swimming lessons, according to the invention, removes the disadvantages presented by the fact that it consists mainly of a panel immersed in the pool connected to a sensor system and which controlls an optical stimulus, calculating the dynamic parameters corresponding to the athlete's activity.

[0006] The invention has the following advantages:

- the equipment is mobile, easy to transport and mounted in the return area;
- the equipment can be easily adjusted according to the configuration and performance of the learner;
- the equipment allows learning the flip turn procedure by indicating the optimal moment to start the movement, indicating the optimal place to achieve the impact for propulsion and indicating the dynamic parameters of the movement at the end of the procedure.

[0007] The following is an embodiment of the invention in connection with Figure 1 and Figure 2, which are as follows:

- fig. 1 - overview of the equipment and the location;
- fig. 2 - the component elements of the immersed panel.

[0008] Equipment for flip turn learning in swimming lessons, according to the invention, consists mainly of a parallelipipedic panel 1, which is immersed in the pool at the end of the athlete's flip turn zone and which contains at the bottom the impact area 2, internally equipped with a sensor force 3, and a light source 4, connected to a command and control microsystem 5, together with the presence sensor 6, mounted on the side of the pool lane and the impact force 7 and speed 8 indicators, the panel having a graduated ruler 9 to determine the immersion depth and an adjustable gripping device 10.

[0009] The panel 1 is internally powered by batteries, immersed in water and fixed with the device 10 on the edge of the pool so that the impact area 2 corresponds to the configuration of the tested athlete and the presence sensor 6 is placed on the side of the swimming lane at a distance x depending of the athlete's configuration to detect the presence of the swimmer and trigger the light stimulus - light source 4, which visibly illuminates the impact area 2. When the presence sensor 6 detects the athlete's swimming arrival, it commands the command and control microsystem 5 which illuminates the impact area 2 through the internal light source 4 so that the athlete begins the return procedure and at the same time identifies the optimal area for the impact. At the moment of impact, the pushing force of the athlete is measured with the internal force sensor 3 and the supply of the light source 4 is stopped, calculating the speed by the time elapsed between the moment when the signal from the presence sensor 6 is emitted and the signal from force sensor 3, the impact force is displayed and implicitly the correct impact area on indicator 7 and the athlete's speed on indicator 8, information that describes the correct execution of the return procedure and sports performance and which can be stored by the command and control microsystem 5 to be able to analyze a history of the athlete's attempts.

[0010] Equipment for flip turn learning in swimming lessons, according to the invention, can be reproduced with the same performance and characteristics whenever necessary, which is an argument in favor of compliance with the criterion of industrial applicability.

References

[0011]

[1]. D. E. RYLAND. *Systems and methods for developing correct mechanics of a swimming flip turn. Patent no.* US7377784 B2, 27.05.2008.

Claims

1. Equipment for flip turn learning in swimming lessons, **characterized in that** it consists mainly of a parallelepipedic panel (1), which is immersed in the pool at the end of the athlete's flip turn zone and which contains at the bottom the impact area (2), equipped internally with a force sensor (3), and a light source (4), connected to a command and control microsystem (5), together with the presence sensor (6), mounted on the side of the pool lane and the impact force (7) and speed (8) indicators, battery-powered panel (1) with a graduated ruler (9) to determine the immersion depth and immerse in water and fasten with the device (10) on the edge of the pool so that the impact area (2) corresponds to the configuration of the tested athlete and the presence sensor (6) is placed on the side of the swimming lane at a distance x according to the athlete's configuration to detect the presence of the swimmer and trigger the light stimulus - the light source (4), which visibly illuminates the impact area (2).

2. Equipment for flip turn learning in swimming lessons, according to claim 1, **characterized in that**, when the presence sensor (6) detects the athlete's swimming arrival, it commands the command and control microsystem (5) which illuminates the impact area (2) through the internal light source (4) for the athlete to start the return procedure and at the same time to identify the optimal area for impact, and at the moment of impact the pushing force of the athlete is measured with the internal force sensor (3) and the power supply is stopped for the light source (4), calculating the speed by the time elapsed between the moment when the signal from the presence sensor (6) is emitted and the signal from the force sensor (3), the impact force is displayed and implicitly the correct impact area on the indicator (7) and the speed of the athlete on the indicator (8), information that describes the correct execution of the return procedure and sports performance and which can be stored by the command and control microsystem (5) in order to be able to analyze a history of the athlete's tests.

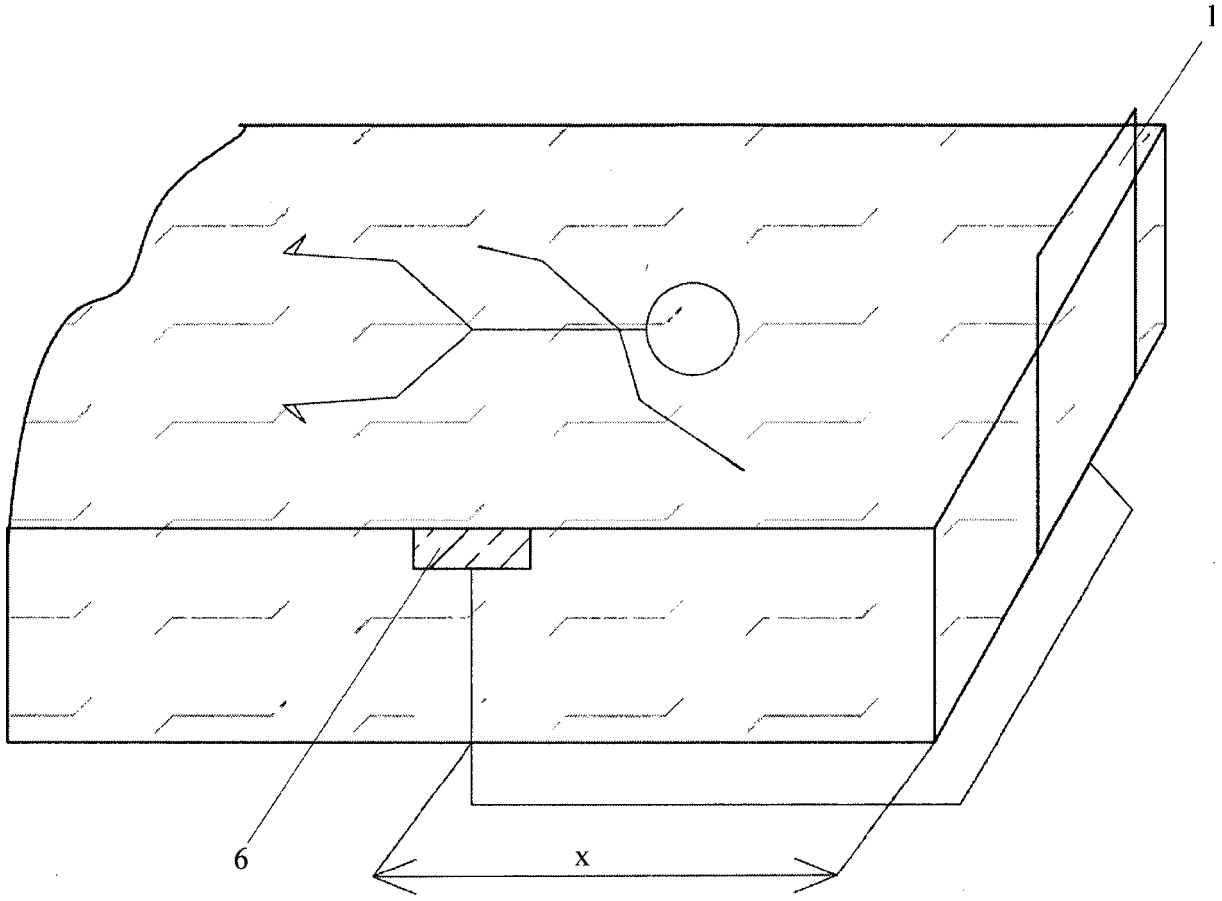

Fig. 1

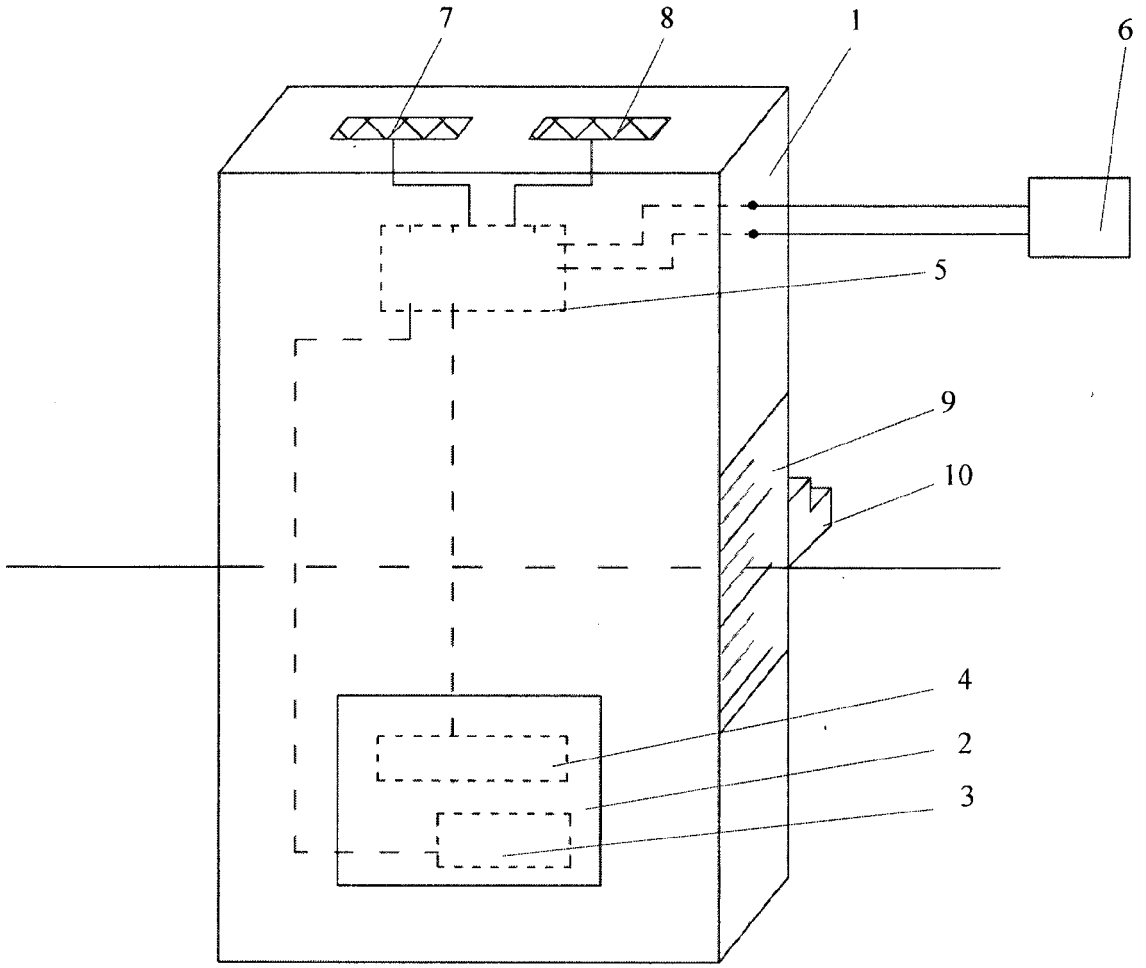

Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 20 46 4007

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 2016/077660 A1 (FRANTZ FREDERICK E [US] ET AL) 17 March 2016 (2016-03-17) * paragraph [0013] - paragraph [0039]; figures *	1	INV. A63B71/06 A63B69/12
A	US 7 029 170 B2 (BALLEY BRAD [US]) 18 April 2006 (2006-04-18) * column 3 - column 6; figures *	1	
A	JP H03 277386 A (AGENCY IND SCIENCE TECHN) 9 December 1991 (1991-12-09) * abstract; figures *	1	
A	US 2016/038815 A1 (SNELL ERIC [US] ET AL) 11 February 2016 (2016-02-11) * paragraph [0030] - paragraph [0040]; figures *	1	
A	WO 85/03881 A1 (GREVES RONALD STANLEY) 12 September 1985 (1985-09-12) * page 4 - page 6 *	1	TECHNICAL FIELDS SEARCHED (IPC)
A	WO 2015/161390 A1 (KISTLER HOLDING AG [CH]) 29 October 2015 (2015-10-29) * page 4 - page 6; figures *	1	A63B G04G G04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 September 2020	Borrás González, E

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 46 4007

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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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- US 7377784 B2 **[0002] [0011]**