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(54) **PROPULSION SYSTEM FOR ASSISTANCE WHEN PADDLING IN SURFING**

(57) Propulsion system for assistance when paddling in surfing; comprising a propellant device (1), hydro jet type, intended to be mounted on a surfboard (T); and a control device (2) in the manner of a bracelet or bracelet suitable for its attachment on a user's arm. The control device comprises: a microprocessor (21), a supply battery (22), sensors (23) that provide the microprocessor (21) with suitable data to identify the user's rowing action, calculating the speed and intensity of paddling and generating a control signal proportional to the paddling intensity of the user and; a wireless communication means (24) that transmits the control signal to the propelling device; and wherein said propelling device varies the propulsion power as a function of the signals received from the control device.

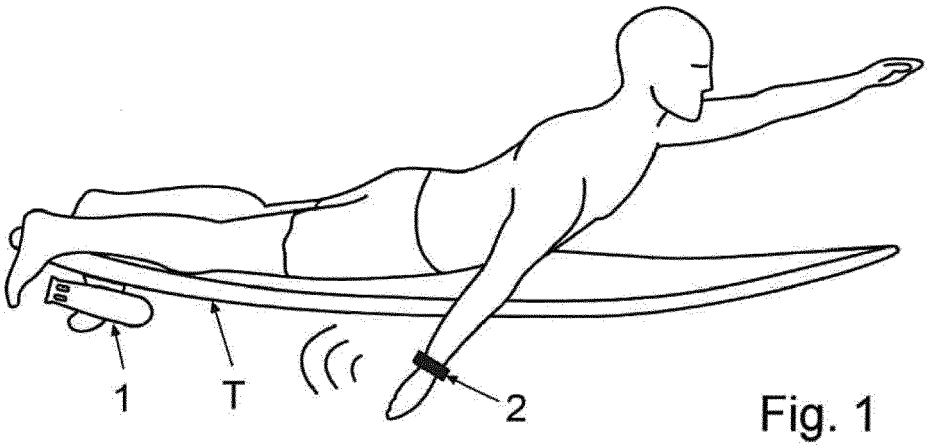

Fig. 1

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Description

Object of the invention.

[0001] The invention relates to a propulsion system for assisting the paddling in the practice of surfing comprising a propelling device intended to be mounted on a surfboard; with the particularity that said propelling device is controlled electronically and wirelessly by a control device suitable for being placed on an arm of the user and which translates the user's strength and speed of paddling into a proportional control signal of the propelling device; so that the propelling device supplies a drive proportional to the paddling intensity of the user.

Field of application of the invention.

[0002] This invention is applicable in the practice of surfing.

State of the art

[0003] In the last decade, both the practice of the surf and the lifestyle, the way of dressing and the tourism associated with it, has increased exponentially, becoming a popular sport of easy initiation in multiple sites of the planet.

[0004] This new situation causes that the public that accedes to begin in the surf is very varied in terms of age and physical condition.

[0005] Surfing is a very demanding sport physically and technically, as well as being dangerous on multiple occasions due to various factors, such as the complexity of the tides, the impacts of the waves and the physical wear to which the practitioners are exposed, which are not always in the best physical conditions.

[0006] The forecasts are that this sector will continue to grow in number of users and new companies are appearing to offer the service of training and rental of material.

[0007] The materials used are being modernized in some aspects, such as the incorporation of technical fabrics into garments that offer greater thermal protection; or the incorporation in the surfboard of impulse means controlled at will by the user and that allow to move without making any effort.

[0008] Obviously, the incorporation of these means of drive in the surfboard, eliminates the need to make a physical effort to practice surfing and therefore one of the important aspects of surfing is precisely the practice of a sport with an important physical requirement, especially during the paddling operation to overcome and catch the wave, or "take off".

[0009] Another point to keep in mind is that the practice of surfing is stationary, which means that users are not regularly practicing this sport of high physical demand, so at the time of practice, they are not always in optimum physical condition to be able to practice surfing properly.

[0010] Taking into account the physical demand that requires practicing and enjoying surfing, the technical problem that arises is the development of a paddle assistance system that provides the user with safety and assistance in the displacement produced by paddling proportional to the effort of paddling by the user, for example to leave a complicated area, but with requiring its operation physical effort of the user.

[0011] It is worth mentioning that the applicant of the present invention is unaware of the existence of previous background that present technical, structural and constitutive characteristics like those presented by the paddle assistance system in the surfing practice of the present invention.

Description of the invention.

[0012] In order to face these problems, a propulsion system has been designed for surfing assistance in the practice of surfing, being of the type that incorporates a propelling device associated with the surfboard, it has the particularity that said propelling device is controlled electronically and wirelessly by a control device suitable for being placed on a user's arm which translates the force and speed effected by the user when paddling on a proportional control signal of the propelling device.

[0013] The control device has a configuration such as a bracelet or armband, suitable for attachment to a wrist or arm of the user and comprises: - a microprocessor, - a power supply battery, - sensors that provide the microprocessor with data suitable for identifying the action of paddling, calculating the speed and intensity of paddling and generating a control signal of the propelling device proportional to the paddling intensity of the user and; - wireless communication means, suitable for transmitting the control signal to the propellant device incorporated in the surfboard.

[0014] It should be mentioned that the sensors integrated in the control device comprise at least one of those indicated below: a pressure sensor, an inclinometer, a gyroscope, a geomagnetic sensor or an accelerometer. The possibility of incorporating in the control device sensors capable of taking from the user the values of vital signs that vary during the performance of an effort or in a stress situation, such as blood pressure or heart rate, has also been envisaged.

[0015] The propellant device, hydro jet type, comprises: a propeller or propeller driven by the corresponding motor, power batteries and control unit provided with a wireless receiver for capturing the signals coming from the control device; and wherein said control unit is responsible for varying the power of propulsion according to the signals received from the control device, and consequently proportional to the user's padding intensity.

[0016] In an embodiment of the invention, the propeller device is integrated in a detachable keel provided with standard fastening means, which allows its incorporation into any current surfboard of the market and of any man-

ufacturer.

[0017] This feature allows the system of the invention, composed of the propelling device and the control device, not to be integrated or permanently associated with a certain surfboard, and which can be disassembled and transported in a small space, without the surfboard, for later assembly in any other surfboard.

[0018] This propulsion system gives the user more power in the paddling, necessary to match its speed with the wave and to start then the phase of catching the wave or "take off" and surfing.

[0019] If the user is not paddling the device does not provide propulsion, since the propulsion goes direct, provided and only associated with the paddling action of the user, if the user does not row the system does not propel.

[0020] This feature provides a very real feeling to the user since it will never be propelled only artificially, unlike what happens with existing products in the market.

[0021] With this drive system the technique is not altered, nor the natural or authentic practice of surfing since the knowledge, experience to have a good position and control the timing depends on the knowledge of the surfer, as well as the technique of tracing and catch the wave or "take off" and the next maneuvers of turns on the wave.

[0022] Actually, this drive system only gives you a plus power proportional to the force applied in the paddle just at the time of rowing a selected wave before trying to catch it.

Description of the drawings.

[0023] To complement the description being made and in order to facilitate the understanding of the characteristics of the invention, a set of drawings in which, with an illustrative and non-limiting character, the following has been represented is attached to the present specification:

- Figure 1 shows a schematic view of the propulsion system for assisting the paddling in the practice of surfing, in a position of use.

- Figure 2 shows a diagram of the different elements of the control device, integrated in the bracelet of figure 1 that has been partially represented.

- Figure 3 shows an elevational and partially sectioned view of the propeller device integrated in a keel for surfboards and disassembled from a surfboard that has been partially represented and sectioned.

Preferred embodiment of the invention.

[0024] The propulsion system for surfing assistance in the surfing practice shown in figure 1 comprises a propelling device (1) mounted on a surf board (T) and a control device (2), in the manner of a bracelet, placed on an arm of the user.

[0025] As can be seen in the diagram of figure 2 the control device (2), comprises: - a microprocessor (21), - a power supply battery (22), - sensors (23) that provide the microprocessor (21) suitable data to identify the paddling action of the user, calculate the speed and intensity of paddling and generate a control signal proportional to the paddling intensity of the user and; - wireless communication means (24) suitable for transmitting the control signal to the propellant device (1) incorporated in the surfboard (T).

[0026] In the exemplary embodiment shown in FIG. 3, the hydro jet-type propeller device (1) comprises: a propeller or propulsion propeller (11) with the corresponding motor (12), - a control unit (13) provided with a wireless receiver (not shown) of the signals from the control device (2) and power batteries (14).

[0027] As mentioned, the function of the control unit (13) is to vary the propulsion power as a function of the signals received from the control device (2), and consequently proportional to the user's padding intensity, providing an assistance to the paddling action.

[0028] In the embodiment shown, the propeller device (1) is integrated into a removable keel (15) provided with standard fastening means (16) for mounting on different surfboards.

[0029] Once the nature of the invention has been sufficiently described, as well as a preferred embodiment, it is stated for the appropriate purposes that the materials, shape, size and arrangement of the described elements may be modified, provided that this does not entail an alteration of the essential features of the invention that are claimed below.

Claims

1. Propulsion system for assistance when paddling in surfing; comprising a propellant device (1), hydro jet type, intended to be mounted on a surfboard (T); **characterized in that** it comprises a control device (2) with a bracelet or bracelet-like configuration suitable for being held on an arm of the user and comprising: - a microprocessor (21), - a power supply battery (22), - sensors (23) that provide the microprocessor (21) with suitable data to identify the user's paddling action, calculate the speed and intensity of paddling and generate a control signal proportional to the paddling intensity of the user and; - a wireless communication means (24) that transmits the control signal to the propelling device (1); and wherein said propelling device (1) varies the propulsion power as a function of the signals received from the control device (2), and proportionally to the user's padding intensity.

2. System, according to claim 1, **characterized in that** the propellant device (1), hydro jet type, comprises: - a propeller or propulsion propeller (11) with the corresponding motor (12), - a control unit (13).) provided

with a wireless receiver (not shown) of the signals from the control device (2) and power batteries (14); and wherein said control unit (13) is responsible for varying the propulsion power based on the signals received from the control device (2).

3. System, according to claim 2, **characterized in that** the propelling device (1) is integrated into a removable keel (15) provided with standard fastening means (16) for mounting on different surfboards.

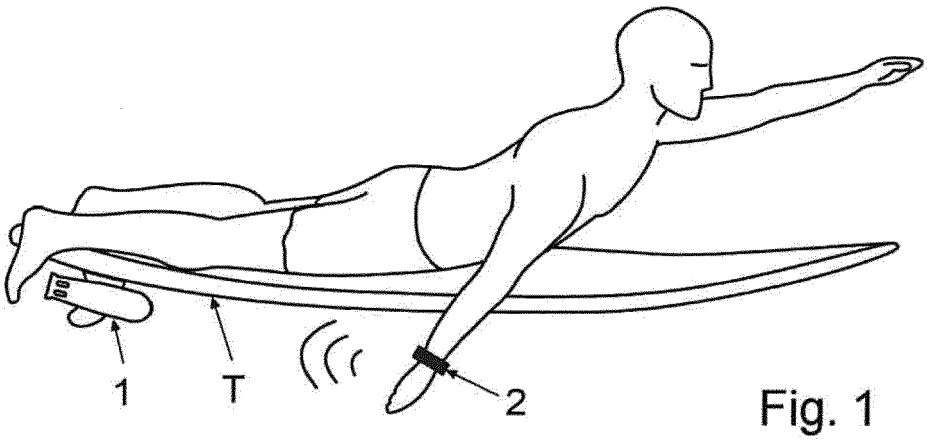

Fig. 1

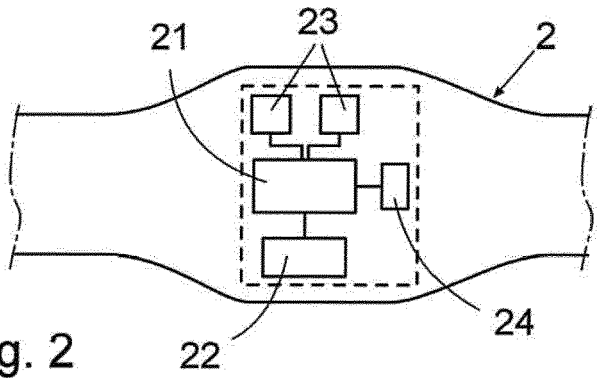

Fig. 2

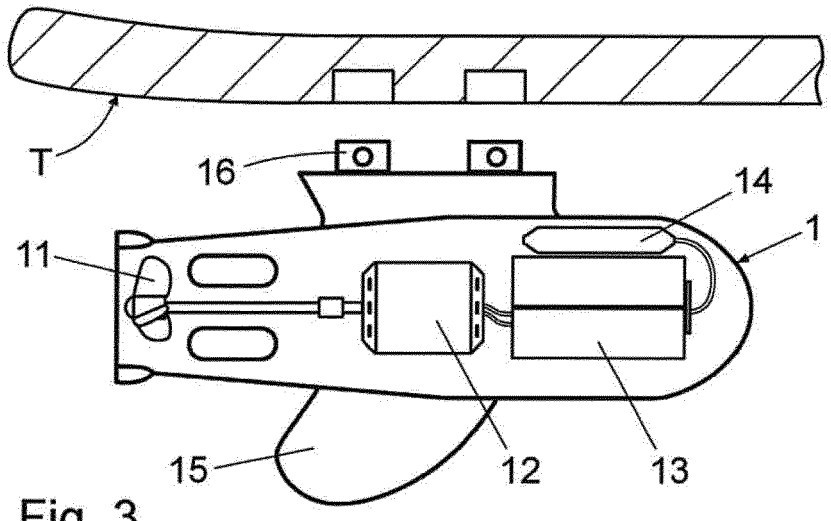

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 19 15 4149

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2012/003333 A1 (BOOMERBOARD LLC [US]; RAILEY MIKE R [US]; VLOCK MICHAEL [US]) 5 January 2012 (2012-01-05) * paragraph [0045]; figures 1-3,7,9,14-19 * * paragraph [0049] *	1-3	INV. B63H21/21 ADD. B63B35/79 B63H11/02 B63H21/17
A	US 2003/167991 A1 (NAMANNY STAN [US]) 11 September 2003 (2003-09-11) * figures 1-5,7 *	1-3	
A	US 2011/256518 A1 (ROTT DAINURI [US]) 20 October 2011 (2011-10-20) * paragraph [0024]; figures 1,3 *	1-3	
A	CN 106 617 525 A (GCI SCIENCE & TECH CO LTD) 10 May 2017 (2017-05-10) * abstract; figure 1 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B63H
B63B
G06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 April 2019	Székely, Zsolt

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 15 4149

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