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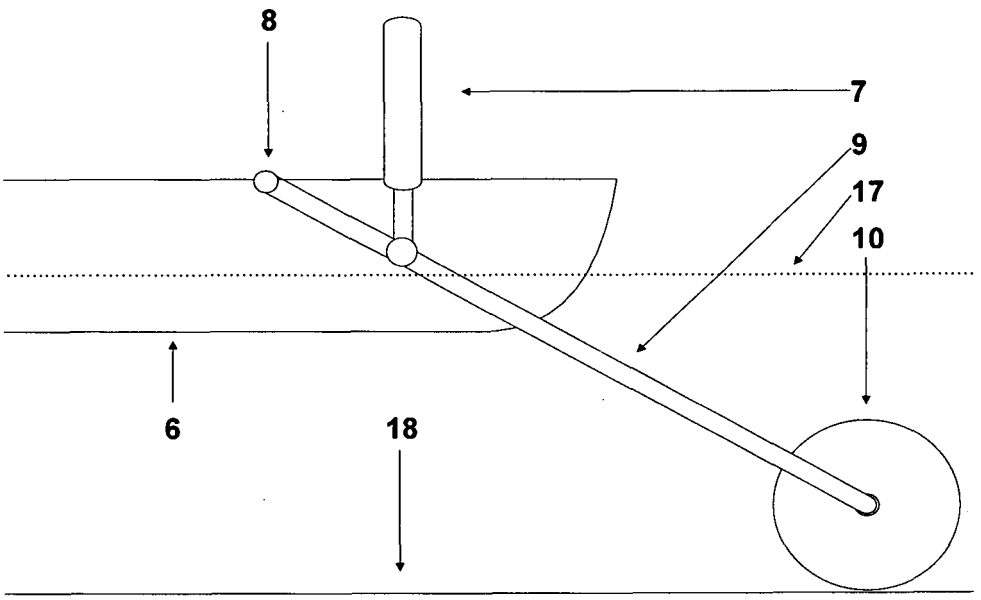
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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) **Ship propelled by direct engagement of wheels with the water-bed**

(57) A watercraft on a river or lake propelled by wheel(s) relatively to the river or lake bottom like automobiles are propelled by wheels relatively to the road surface.

Figure 2



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Description

[0001] The present invention relates to the propulsion of watercrafts on a river or lake.

[0002] Ships and boats are commonly propelled by screw-propellers. This propulsion mode utilizes energy of a motor to move the watercraft relatively to the water. This means that in a river energy is needed to keep a watercraft at a fixed geographic position by propelling it relatively to the water current.

[0003] The present invention suggests a propulsion where not only the energy loss caused by the river current can be eliminated but the energy of the river current can be utilized to propel the watercraft.

[0004] According to the present invention the watercraft is propelled by wheel(s) relatively to the river or lake bottom like automobiles are propelled by wheels relatively to the road surface. No energy from a motor is needed to keep the watercraft at a fixed position in a river. Moreover, the river current's energy can be captured by a device similar to a water turbine or water screw to generate energy to drive the craft's wheel(s). This can be the sole source of the wheel drive or additional source to the drive provided by a motor.

[0005] The ship's wheel(s) can be kept on the river bottom in two ways:

Case 1: By the weight of the device they are mounted on. The device is a kind of anchor on wheels that is tied to the watercraft.

Case 2: By a water depth regulated device that utilizes the watercraft's own weight to provide the force by which the wheel is kept at the river or lake bottom.

[0006] Two embodiments of the present invention, one for each of the above two cases, will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is the view of a wheeled anchor as embodiment of the propelling device according to case 1;

Figure 2 is the side view of a watercraft equipped with a wheel on a pivoted fork pressed to the river or lake bottom by a hydraulic cylinder as embodiment of the propelling device according to case 2;

Figure 3 is the top view of the watercraft from figure 2.

Detailed description of the embodiment according to case 1

[0007] A wheeled anchor is provided as shown in figure 1. The rope or cable connecting the wheeled anchor to the watercraft is tied to the eye 3 on the input drive shaft 2 of a differential 1. The torque of a motor or water turbine is transmitted from the watercraft by torsion of this rope or cable to the input drive shaft 2 of the differential 1 which transmits this torque to the wheels 4 mounted on its two output half shafts allowing the wheels 4 to rotate at different speeds while supplying equal torque to each of them. The bulge shape 5 of the outer side of the wheels is preventing the anchor to lie on the river or lake bottom in a position where any of the wheels is not touching the ground. The length of the input drive shaft 2 exceeds the length of the output half shafts of the differential 1 in order to have the pull of the rope or cable connecting the watercraft to the anchor turn the anchor into a position where the axis of rotation of the wheels 4 is perpendicular to the axis connecting the watercraft with the anchor. This enables the steerage of the watercraft using a classical rudder.

Detailed description of the embodiment according to case 2

[0008] A watercraft equipped with a wheel on a pivoted fork pressed to the river or lake bottom by a hydraulic cylinder is provided. As shown in figure 3 the wheel 10 is mounted on a fork 9 that is connected to the watercraft 6 on each side by means of a pivot joint 8. The size of the fork 9 must be sufficient to include the whole fore of the watercraft 6. On one side of the watercraft 6 the barrel part of a hydraulic cylinder 7 is mounted to. As shown on figure 2 the piston rod of the hydraulic cylinder 7 is attached to the corresponding arm of the fork 9. The force of the hydraulic cylinder 7 thus can turn the fork 9 around the joints 8 and push the wheel 10 to the river or lake bottom 18. The force that pushes the wheel 10 to the river or lake bottom 18 depends on the hydraulic pressure in the hydraulic cylinder 7. Thus this pressure can be measured and used to control the position of the fork 9 so that the wheel 10 is always pressed to the river or lake bottom with changing water depth by means of an automatic control system. The force by which the wheel 10 is pressed to the river or lake bottom 18 can be selected and is limited only by the weight of the watercraft 6. The pivot joints 8 on the sides of the watercraft 6 as well as the hydraulic cylinder 7 are supposed to be above water level 17. As shown on figure 3 the torque of a motor 11 is transmitted by a shaft 12 through the centre of one of the pivot joints 8 to a bevel gear 13 that transmits it further to a shaft 14 parallel to the corresponding arm of the fork 9. This shaft 14 then transmits the torque to the wheel shaft 16 through another bevel gear 15.

Claims

1. A watercraft to be used on a river or a lake the propulsion of which is **characterized by** impacting the river or lake bottom by a device which or part of which is revolving like a wheel.

2. A water craft according to claim 1 the river or lake bottom impacting device of which is loosely connect-

ed to the watercraft via a rope or cable where the actuation is transmitted from the watercraft to the device using torsion of the rope or cable.

3. A watercraft according to claim 1 the river or lake bottom impacting device of which is mounted onto the watercraft so that the revolving part can be positioned in various depths and the actual position of which is controlled by the force impact of the device to the river or lake bottom.

4. A watercraft according to any of the previous claims capable of also other propulsion modes that might not impact the river or lake bottom.

5. A watercraft according to any of the previous claims that utilizes the energy of the river stream to provide fully or partly the energy to the watercraft's propulsion.

6. A device that can convert a watercraft into a watercraft according to any of the previous claims.

7. A device that is an essential part of a device according to claim 6.

Amended claims in accordance with Rule 137(2) EPC.

1. A watercraft anchor **characterized by**: wheels (4) or other revolving parts impacting the water-bed; a revolving shaft (2) attached to the rope or cable that connects the anchor with the watercraft; a transmission (1) that transmits the torque created by torsion of the rope or cable connected to the revolving shaft from this shaft to the water-bed impacting revolving parts.

2. A watercraft anchor according to claim 1 **characterized in that** the rope or cable attached to the revolving shaft (2) is not the main connection of the anchor to the watercraft but a link to a driving device like a water turbine outside of the watercraft.

Figure 1

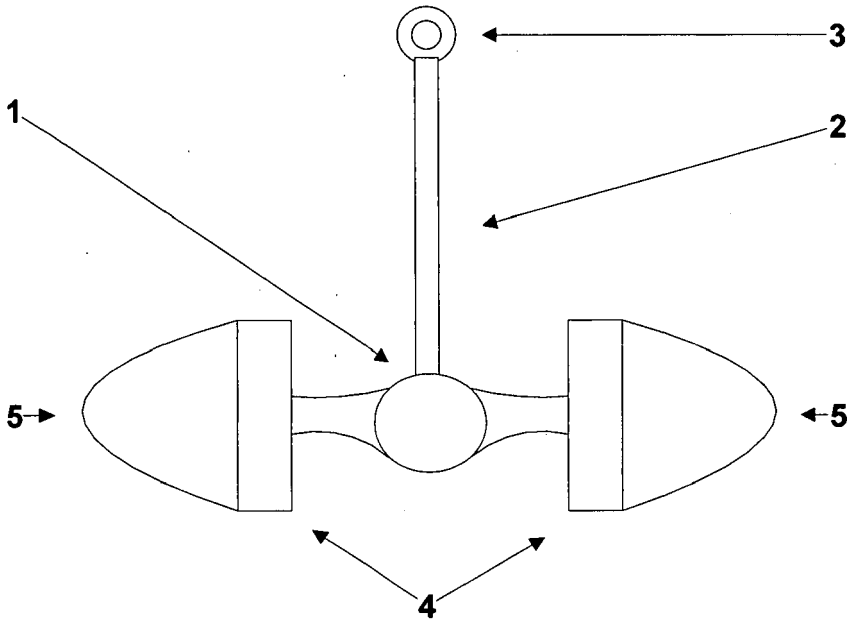


Figure 2

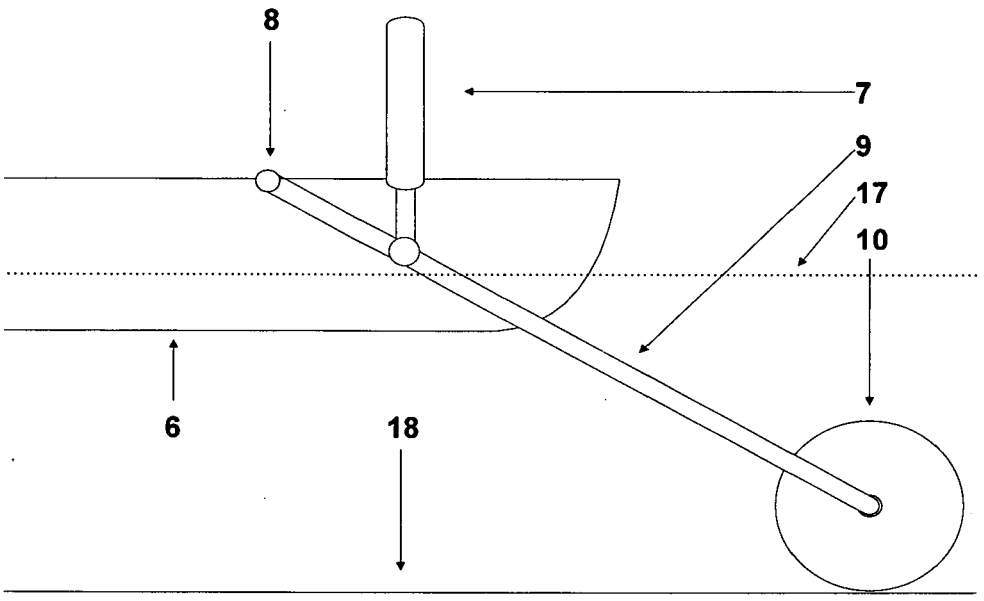
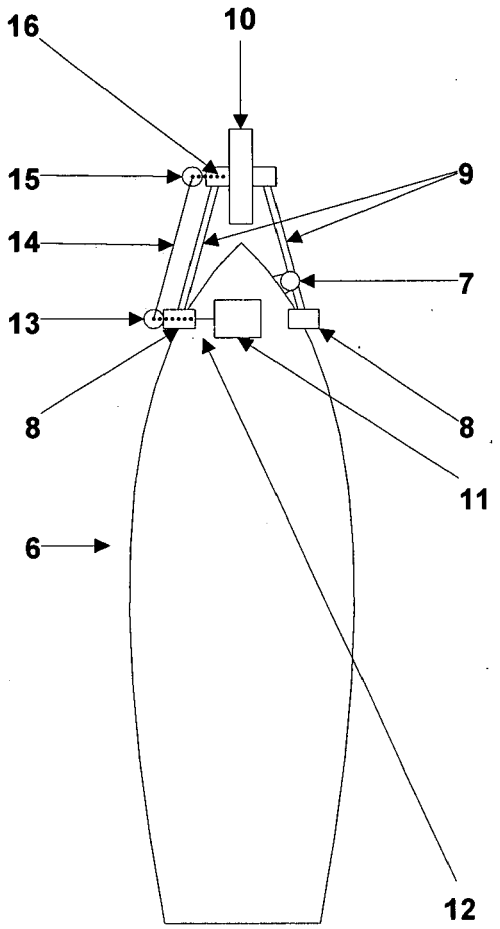


Figure 3



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PARTIAL EUROPEAN SEARCH REPORT

Application Number EP 09 00 8305

which under Rule 63 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

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	DE 806 947 C (BRUNO STARK) 21 June 1951 (1951-06-21) * page 2, line 14 - line 104; figures 1-3 *	1,3-6	INV. B63H19/08
X	DE 35 24 616 A1 (MESSMANN JOSEF FA [DE]) 15 January 1987 (1987-01-15) * column 4, line 62 - column 6, line 35; figures 1-3 *	1,3-4,6	
X	FR 559 408 A (JAUNEAU, JEAN-MARIE) 15 September 1923 (1923-09-15) * page 1, line 17 - page 2, line 2; figure 1 *	1,3,5-6	
X	FR 744 184 A (LEFEBVRE-GRANDMAISON, OLIVIER [FR]) 14 April 1933 (1933-04-14) * page 1, line 41 - page 2, line 59; figures 1,2 *	1,3,5-6	
X	US 193 511 A (HETZLER, JOHN H.) 24 July 1877 (1877-07-24) * page 1, paragraph 10 - page 2, paragraph 2; figures 1-3 *	1,3,6	TECHNICAL FIELDS SEARCHED (IPC) B63H

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INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
Munich	8 December 2009	Brumer, Alexandre

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
P : intermediate document

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

3

EPO FORM 1503 03.82 (P04E07)

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PARTIAL EUROPEAN SEARCH REPORT

Application Number
EP 09 00 8305

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	CH 143 559 A (ABETEL MAURICE [CH]) 15 November 1930 (1930-11-15) * page 2, paragraph 1 - paragraph 5; figures 1,2 *	1,3,6
X	US 5 782 660 A (BRICKELL JOSEPH [US] ET AL) 21 July 1998 (1998-07-21) * column 3, line 7 - column 4, line 44; figure 1 *	1,3,6

CLASSIFICATION OF THE APPLICATION (IPC)

TECHNICAL FIELDS SEARCHED (IPC)

EPO FORM 1503 03.82 (P04C10) 3

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INCOMPLETE SEARCH
SHEET C

Application Number
EP 09 00 8305

Claim(s) completely searchable:
1-6

Claim(s) not searched:
7

Reason for the limitation of the search:

Claim 7 is not containing any features as such, but a mere statement "a device which is an essential part of a device according to claim 6", such that no meaningful search is possible.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 00 8305

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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08-12-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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DE 3524616 A1	15-01-1987	NONE	
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EPO FORM P0459

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