motor as first propulsion means, the use of the floating structure the stern of the boat may, advantageously, reduce the fuel consumption. According to another connected advantage, the oscillating keel may be coupled to a generator (e.g. electrical) with which to provide the boat electrical energy.

[14] Note that in the presence of swell, the flap forces relative movement between the keel and the floating structure by oscillating rotation, thus allowing recovery of the energy from the movement of the waves. Further, in reaction, the movement of the flap is also forced by the relative heaving of the keel and the floating structure, leading to two relative movements which are coupled and mutually amplifying one another.

[15] In the case where the floating structure is connected to an anchoring element, the generated propulsion may contribute to reducing the force exerted on the anchoring point. This reduction of the anchoring force has the advantage of allowing lighter and less costly anchoring solutions.

[16] In various examples, one and/or another of the following dispositions could further be used.

[17] According to an example, the hinged system may comprise a pivoting connection (A1) between the flap (3) and the keel. By these means, a robust and easy-to-implement connection results in order to allow the reciprocating of the flap relative to the keel.

[18] According to an example, the hinged system may comprise a connecting rod connection (4) between the flap (3) and the floating structure (1). This forms a simple and basic and robust mechanical connection which does not require maintenance. According to an alternative option, in place of a connecting rod system, there could be a guide using sliding of pins in openings or another auxiliary guiding system.

[19] According to an ~~example~~aspect, the hinge system ~~may~~ comprise~~s~~ a connecting element (4) connected to the floating structure (1) by a pivoting connection (A2) and connected to the flap (3) by a pivoting connection (A3). The connecting element in question is comparable to a connecting rod which allows a pivoting movement of the flap relative to the keel without major parasitic movement compared to the floating structure. Further, this forms a simple and basic and robust mechanical connection.

[20] According to an example, the flap (3) may further comprise a rear extension of the surface thereof (8), where said rear extension is connected to a front part of the flap (83) by a pivoting connection (A8).

[21] This serves to amplify the propulsion effect, since the reciprocating of the rear extension is slightly later in phase than the reciprocating of the front part of the flap.

[41] According to an example, the device may be connected to at least one anchoring element, for example to a buoy or any floating element with substantially fixed position. The effective anchoring force is reduced in this way; lighter weight and less costly anchoring solutions may thus be chosen. Further, reduced dimensions of the anchoring, and also of the lash onto the device lead to solutions that are easier to install and therefore less costly. They are more durable and experience less wear in comparison to passive anchorings.

[42] According to an example, the device may be fixed to the stern of a boat or incorporated in the stern of a boat. The fuel consumption of powered ships is thus reduced with such a solution aiding propulsion by drawing its energy from the energy of the swell.

[43] According to an example, the device may comprise a restoring spring between the floating structure (1) and the keel (2).

[44] According to an example, the flap may have a rectangular or triangular or trapezoidal shape.

[45] According to another example, a device is proposed for propulsion and for conversion of the energy from the movement of waves comprising at least one floating structure connected to at least one anchoring element, at least one keel mounted mobile on the floating structure, along at least one sliding movement relative to said floating structure along a heaving axis, at least one means for transmission of the relative movement of said keel to at least one electrical converter for converting the mechanical energy of said movement into electrical energy,
characterized in that it comprises at least one flap connected by a hinged system to the keel and to the floating structure, where said flap is configured for being positioned under the surface of the water, laid out so as to follow the oscillations of said keel by oscillating rotation under the action of wave movements, and generating a propulsion force directed substantially towards the center of gravity of said floating structure.

[46] Most of the optional characteristics described above can be used in combination with the device disclosed in the preceding paragraph.

[47] According to another aspect, a device for propulsion and for recovery of the energy of the movement of waves is proposed comprising:
- at least one floating structure;
- at least one keel mounted mobile on the floating structure, according to at least one sliding movement relative to said floating structure along a heaving axis,
characterized in that it comprises at least one flap connected by a hinged system both to the keel and also to the floating structure, where said flap is configured for being positioned under the surface of the water, arranged so as to follow the oscillations of said keel by oscillating rotation under the action of wave movements, and where said flap is configured for generating a propulsion force directed

CLAIMS

Claim 1. A device for propulsion and for recovery of the energy of the movement of waves comprising:

- at least one floating structure;

- at least one keel mounted mobile on the floating structure, according to at least one sliding movement relative to said floating structure along a heaving axis,

characterized in that it comprises at least one flap connected by a hinged system both to the keel and also to the floating structure, where said flap is configured for being positioned under the surface of the water, arranged so as to follow the oscillations of said keel by oscillating rotation under the action of wave movements, and generating a propulsion force directed substantially towards the center of gravity of said floating structure, and wherein in that the hinged system comprises a connecting element connected to the floating structure by a pivoting connection and connected to the flap by a pivoting connection.

Claim 2. The device according to claim 1, characterized in that the hinged system comprises a pivoting connection between the flap and the keel.

~~**Claim 3.** The device according to any one of claims 1 to 2 characterized in that the hinged system comprises a connecting rod connection between the flap and the floating structure.~~

~~**Claim 4.** The device according to any one of claims 1 to 2 characterized in that the hinge system comprises a connecting element connected to the floating structure by a pivoting connection and connected to the flap by a pivoting connection.~~

~~**Claim 5.**~~**Claim 3.** The device according to any one of the preceding claims, characterized in that the flap further comprises a rear extension where said rear extension is connected to a front part of the flap by a pivoting connection.

~~**Claim 6.**~~**Claim 4.** The device according to claim ~~5~~3, characterized in that said rear extension is returned to a neutral angular position relative to the front part of the flap by a spring restoring system.

~~**Claim 7.**~~**Claim 5.** The device according to any one of claims 1 to ~~4~~2 characterized in that the keel comprises several flaps arranged one under the other, mounted so as to remain parallel with each other.

~~**Claim 8.**~~**Claim 6.** The device according to any one of claims 1 to ~~5~~3 characterized in that a resting position of the flap is defined by a fixed angle, where said fixed angle is defined by the surface of said flap and the longitudinal axis perpendicular to the keel.

~~Claim 9.~~**Claim 7.** The device according to any one of claims 1 to ~~6~~ 4 characterized in that the body of the flap extends mainly in a work plane and the width of the flap increases going away from a zone where the hinged system connects the flap to the keel.

~~Claim 10.~~**Claim 8.** The device according to any one of claims 1 to ~~9~~ 7 further comprising at least one means for transmission of the relative movement of said keel to at least one electric converter in order to convert the mechanical energy of said movement into electrical energy, where the device then has a function of conversion of the energy of the movement of the waves.

~~Claim 11.~~**Claim 9.** The device according to claim ~~10~~8, further comprises a control unit configured for driving the power collection rate in the electrical converter so as to thus balance between the propulsion produced by the countercurrent swimming and the transformed energy from the swell.

~~Claim 12.~~**Claim 10.** The device according to any one of claims ~~10~~ 8 to ~~11~~9, characterized in that the transmission means is at least one hydraulic cylinder.

~~Claim 13.~~**Claim 11.** The device according to one of claims ~~10~~ 8 to ~~12~~9, characterized in that the electric converter is an electrical generator coupled to a **hydraulic motor**.

~~Claim 14.~~**Claim 12.** The device according to any one of the preceding claims, characterized in that it is connected to at least one anchoring element.

~~Claim 15.~~**Claim 13.** The device according to any one of claims 1 to ~~13~~11, characterized in that it is fixed to the stern of a boat or incorporated in the stern of a boat.

~~Claim 16.~~**Claim 14.** A device for propulsion and for recovery of the energy of the movement of waves, comprising:
- at least one floating structure;
- at least one keel mounted mobile on the floating structure, according to at least one sliding movement relative to said floating structure along a heaving axis,
characterized in that it comprises at least one flap connected by a hinged system both to the keel and also to the floating structure, where said flap is configured for being positioned under the surface of the water, arranged so as to follow the oscillations of said keel by oscillating rotation under the action of wave movements, and where said flap is configured for generating a propulsion force directed substantially towards the center of gravity of said floating structure, and in that the hinged system comprises at least one control arm mounted in rotation on the keel by a first pivoting connection, and at least one linkage connected to the floating structure by a second pivoting connection and connected to said control arm(s) by a third pivoting connection, where the flap is mounted in rotation on said control

arm(s) by means of a hinge arranged in a rear position cantilevered relative to the third pivoting connection.

~~**Claim 17.**~~**Claim 15.** The device according to claim ~~16~~14, wherein the flap is returned to a neutral angular position relative to the control arm(s) by a spring restoring system.