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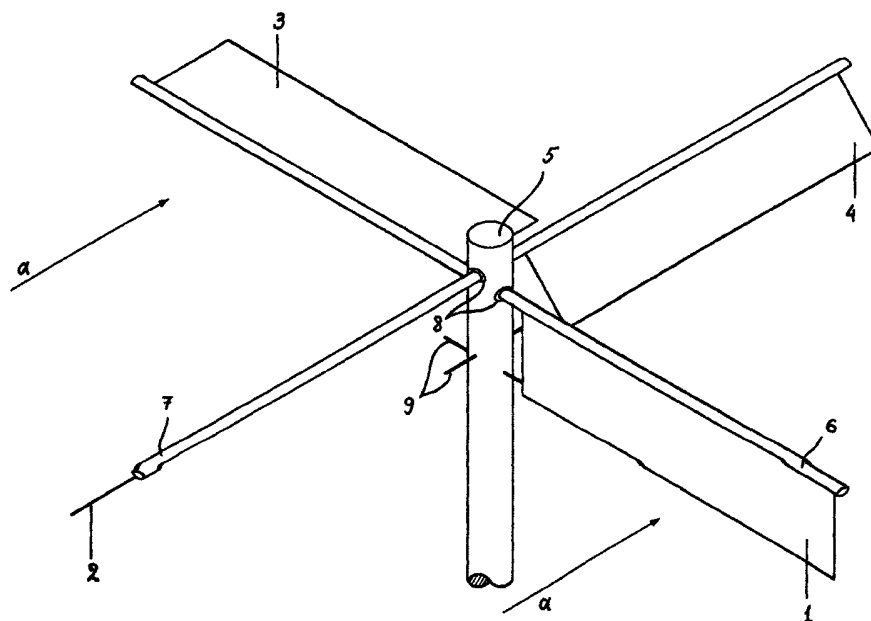
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(54) Title: WIND OR WATER GENERATOR WITH ROTATING BLADES



(57) Abstract: The wind generator with rotating blades and with the vertical revolving shaft is comprised by a vertical shaft (5), two separated horizontal shafts (6), (7), four bearings (8), four stoppers (9) and four blades (1), (2), (3), (4). Under the wind pressure one of the blades are positioned across while the opposite blade located lengthwise to the wind flow. Due to the big difference of the aerodynamic resistance between these blades, the vertical shaft (5) start to revolve. At the same moment the other blades do not create resistance to revolve motion of the vertical shaft (5). (There are in neutral position).



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WIND OR WATER GENERATOR WITH ROTATING BLADES

This invention refers to wind generator which transform the wind power. The wind generators are used in order to transform the aeolian power into
5 mechanic or electric one.

There are two types of wind generators: The one with the horizontal revolving shaft and the other with the vertical revolving shaft. The defects of the wind generator are the fact that for its operation is required a mechanism, which
10 orientates the wind generator towards the wind direction. This has a great frontal resistance to the wind flow so as not being broken the blades, the use of very durable materials is necessary. In addition this has a low output.

The defects of the wind generator with the vertical revolving shaft are: the wind generator of this type is useful only when the wind power is big enough
15 and a motor is required which puts the wind generator into operate at the initial moment. This wind generator has also a low output.

The purpose of the present invention is to delete all the defects mentioned above.

20 The achievement of this purpose comes true as follows: The four wind generator blades are hung, in pairs, on two separated horizontal shafts which between them, form an angle of ninety degrees (90°). These two horizontal shafts are placed on a vertical shaft. Every blade pair on the horizontal shaft is placed in an angle of ninety degrees (90°) between themselves. These
25 horizontal shafts along with the blades can rotate around their shafts in an angle of ninety degrees (90°).

At the moment when one of the horizontal shaft is located across to the wind flow, one blade under the wind press is located across and the other lengthwise to the flow. Every moment only one of the blades is standing

across to the wind flow and operates as a sail, forcing the vertical shaft to revolving.

The force (F) which the wind exercises on the blade which is across to the wind flow, equals to: $F = \rho v^2 L^2$. Where : ρ - is the density of the wind , v - is the flow speed and L - are the linear dimensions of the blade. The blade which is located lengthwise to the wind flow has minimal resistance to the wind.

The wind, revolving the wind generator without any additional mechanism, locates automatically the pair blades one lengthwise and the other across to the flow, regardless the direction from which the wind blows.

The implementation of this construction enables the creation of a simple, reliable and with a great output wind generator. All the equipment, such as: the electric generator, the pump etc. are located on the ground. This means that to facilitated their installation, service and repair.

Also, it is of great importance to point out that the wind generators can be located into levels, so as the power of the wind generator will increase, as shown in Fig. 3.

However the same construction can be used as hydraulic turbine, which is operated by the kinetic water power. This construction down to the river works exactly the same as by the air (Fig. 4.2). The difference is that the density of water is bigger that the density of the air. Furthermore, as at rivers the direction of the water flow (β) is always known (Fig. 4), this construction can be placed into water having the main shaft "vertical shaft" horizontally and across to the water flow direction (Fig. 4.1).

The main point of this invention is clarified by the drawing of Fig. 1, where the shape of the wind generator is depicted. A vertical shaft (5) where two separated and in perpendicularly position horizontal shafts (6), (7), are hung

through four bearings (8). On these horizontal shafts (6), (7) are fixed blades (1), (3) and (2), (4) in pairs, which form an angle of ninety degrees (90°) between them. On the vertical shaft (5) below the horizontal shafts (6), (7) the four stoppers are fixed (9). The horizontal shafts (6), (7) along with the blades (1), (3) and (2), (4) can rotate around their shafts in an angle of ninety degrees (90°). The limitation of the rotation of the horizontal shafts (6), (7) with the blades (1), (3) and (2), (4) is achieved by four stoppers (9). Also, at figure 2 in profile is shown the method of setting the horizontal shafts (6), (7) on the vertical shaft (5).

10 The wind flow (α) from the left (Fig. 1) turns the blade (3) lengthwise and the blade (1) across to the wind flow. The blade (1) is positioned across to the wind flow, along of it leans of the stopper (9). The vertical shaft (5) starts to revolve because the blade (3) resistance to the air is minimal while the one of the blade (1) is big. The force under which the vertical shaft (5) is revolved depends on the wind speed and the surface of the blade which is located across to the wind flow. As soon as the vertical shaft (5) turns to an angle bigger than ninety degrees (90°), the blade (4) will be found lengthwise and the blade (2) across to the wind flow leaning to the stopper (9). At this moment the blade (2) puts in motion the vertical shaft (5) by a turn of ninety degrees (90°). In continuity, the blade (1) will be lengthwise and the blade (3) across to the wind flow. The blade (3) sustain its across position to the wind flow by leaning on the stopper (9). Now the blade (3) operates as sail turning the vertical shaft (5) to an angle bigger than ninety degrees (90°). After that the blade (2), under the wind pressure, will be placed lengthwise and the blade (4) across to the wind flow. Therefore the blade (4), which leans on the stopper (9), acts as a sail, turning the vertical shaft (5). This procedure is continually repeated putting the vertical shaft (5) into revolving.

CLAIMS

1. Wind generator with rotating blades is characterized that it is based on the principle of locating one blade lengthwise and the opposite one, across to the wind flow. The four blades (1), (2), (3), (4), of the wind generator are hung in pairs on two separated horizontal shafts (6), (7) which form an angle of ninety degrees (90°) between them. These two horizontal shafts (6), (7) are placed on a vertical shaft (5) through four bearings (8). Every blade pair (1), (3) and (2), (4) which is hung on the horizontal shafts (6), (7), are create between them an angle of ninety degrees (90°). These horizontal shafts with the blades can rotate around their shafts in an angle of ninety degrees (90°). The limitation of the rotation of the horizontal shafts (6), (7) with the blades (1), (2), (3), (4) is achieved by the four stoppers (9). The four stoppers (9) are fixed on the vertical shaft (5) below the horizontal shafts (6), (7).

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2. Wind generator with rotating blades is characterized that some constructions of this kind are placed into stages, so as the power will be increased, as is shown in Fig. 3.

20 3. Wind generator with rotating blades is characterized that it can transform the kinetic power of the river to mechanic or electric one quite as the same as in the air. (Fig. 4.2).

4. Wind generator with rotating blades is characterized that to utilize the kinetic power of the river (or generally directivity water flow), can be placed into water having the main shaft (5) "vertical shaft" horizontally and across to the direction of the water flow Fig. 4.1.

25

AMENDED CLAIMS and STATEMENT

**[Received by the International Bureau on 21 November 2002 (21.11.02):
original claims 1 to 4 replaced by amended claims 1 to 3 (1 page)]**

1. Wind or water generator with rotating blades consisting of: a vertical shaft (5), above which there are horizontal axes (6),(7) placed with the help of a ball bearing (8), blades (1),(2),(3),(4) hanging above the horizontal axes (6),(7) and stoppers (9) fixed on the vertical shaft (5); it is characterized that, with the view of producing maximum power from the frontal surface occupied by the wind generator, independent horizontal axes (6),(7) which are from the angle of ninety degrees (90°) between them, are located on the vertical shaft (5) at minimal distance the one above the other, which does not disturb their independent operation. On the horizontal axes (6),(7) pairs of orthogonal-shaped blades (1),(3) and (2),(4) are fixed in a 90° -angle between them. Blades (1),(2),(3),(4) are fixed at edges on the horizontal axes (6),(7). Each blade has a length equal to half the length of the horizontal axis (6) or (7) minus the diameter of the vertical shaft (5) and is located at a minimal distance from the vertical shaft (5). All stoppers (9) are located on the same level and are fixed on the vertical shaft (5) beneath the horizontal axes (6),(7).

2. Wind or water generator with rotating blades it is characterized that, in order to increase its power, some similar constructions are placed on the same vertical shaft (5) in floors or in series, when the vertical shaft (5) is in a horizontal condition.

3. Wind or water generator with rotating blades it is characterized that, it can be used to transform the kinetic energy of rivers into mechanical or electrical energy in exactly the same way as in the air. In addition, when there is an oriented water flow, it can be placed in the water with the main shaft (5) "vertical shaft" horizontally and transversely to the direction of the water flow.

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Fascimile No.: (41-22) 740.14.35

International application No.: PCT/ GR 02/ 00041.

Statement under

Dear Sirs,

The proposed construction aims at the maximum utilization of the energy of wind and water flow with large fluctuations of velocity, from the frontal surface occupied by the construction.

This technical problem has been solved in the following way:

Four feathers(blades) are hanging at edges on horizontal axes. This allows you to place the horizontal axes at a minimal distance one above the other on the vertical shaft and place the feathers at a minimal distance from the vertical shaft. Each feather has a surface equal to half the frontal surface occupied by the wind generator. This is shown on figure 1. This solution to the technical problem allows you to use almost 50% of the wind flow energy from the frontal surface occupied by the wind generator.

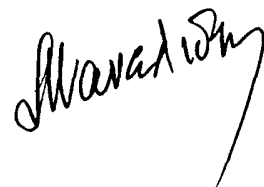
This particular construction can be used in order to transform the kinetic energy of slowly rolling rivers with no need to construct a penstock. It is more advantage to place this construction with the vertical shaft horizontally and transversely to the flow direction, so that the vertical shaft is located on the water surface. By placing a few similar constructions in a series and choosing the appropriate length of feathers (equal to the depth of the channel), you can possibly use over 50% of the energy from the frontal surface of the water flow.

With this way, we are having an economical, durable, and high-output construction.

Yours faithfully

Date : 18/11/2002

Manelidis Vladimiro.



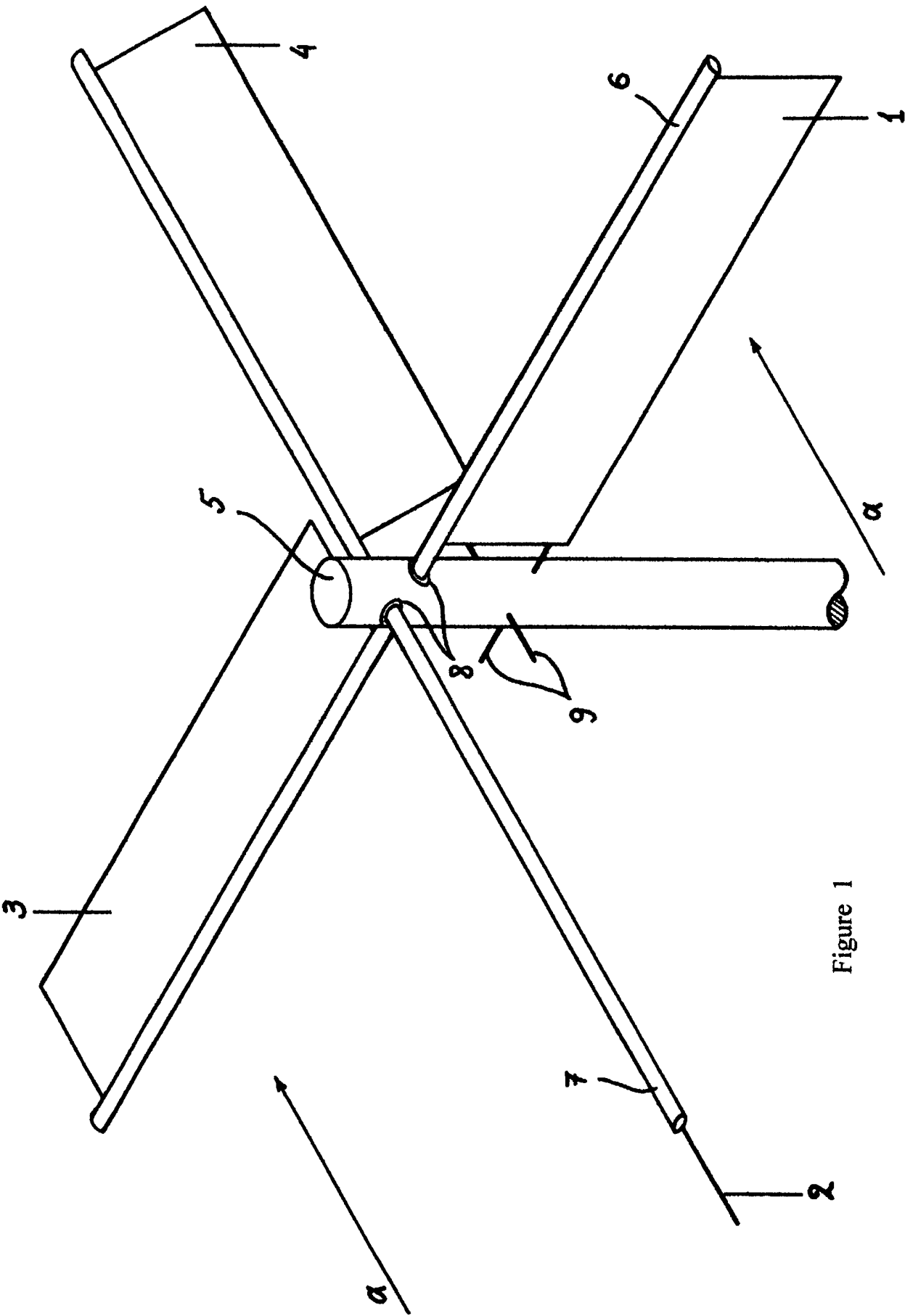


Figure 1

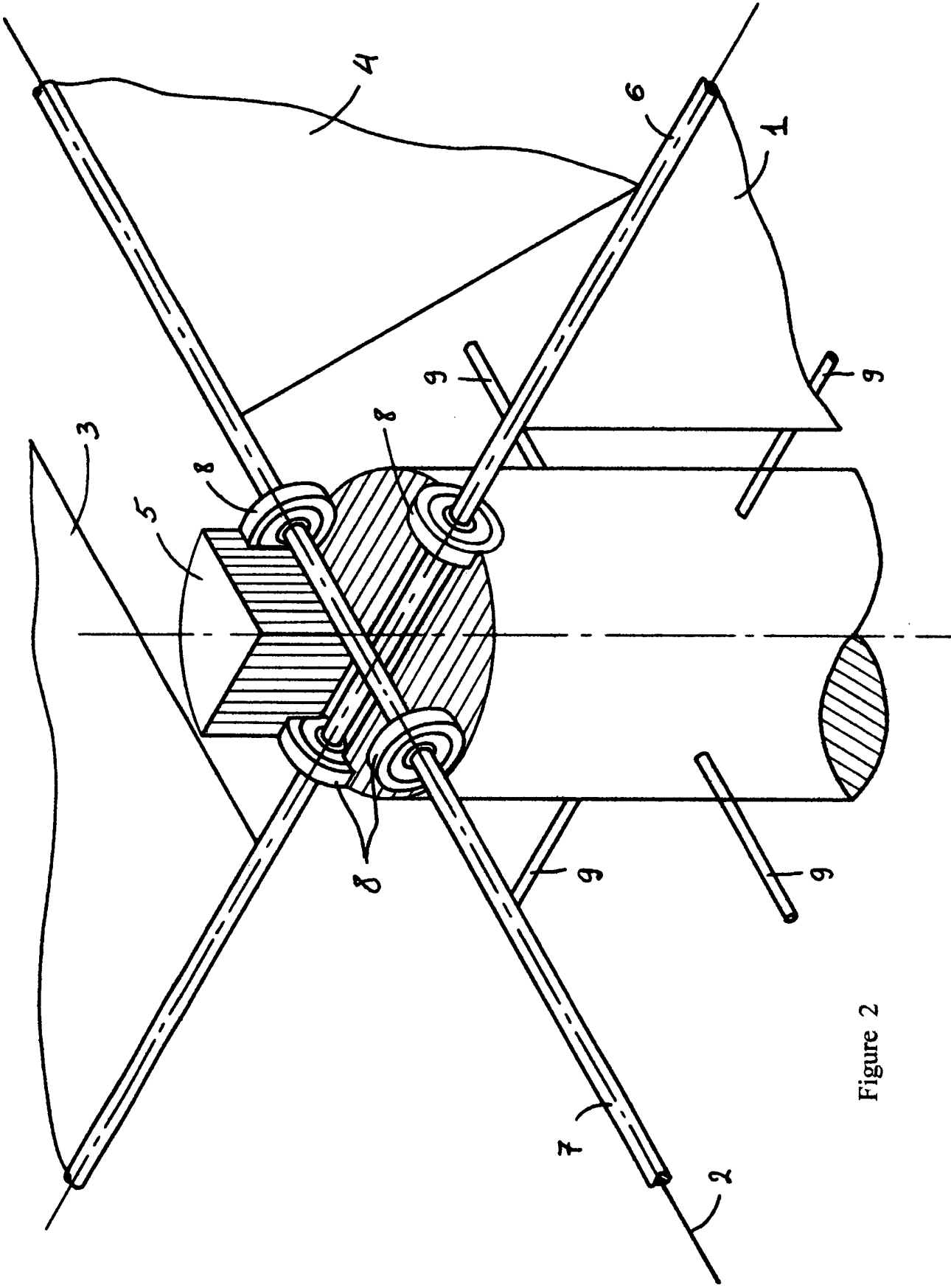


Figure 2

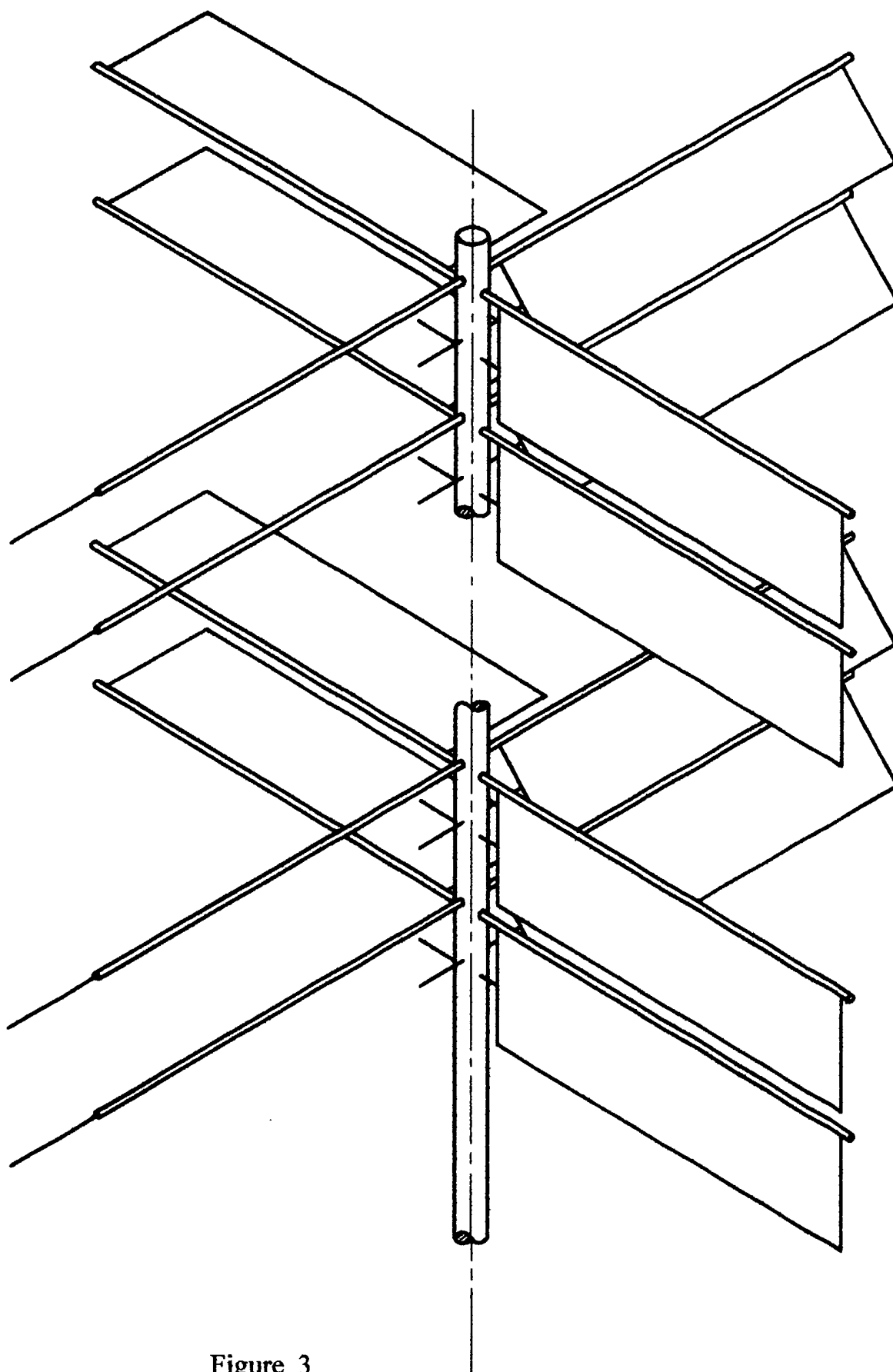


Figure 3

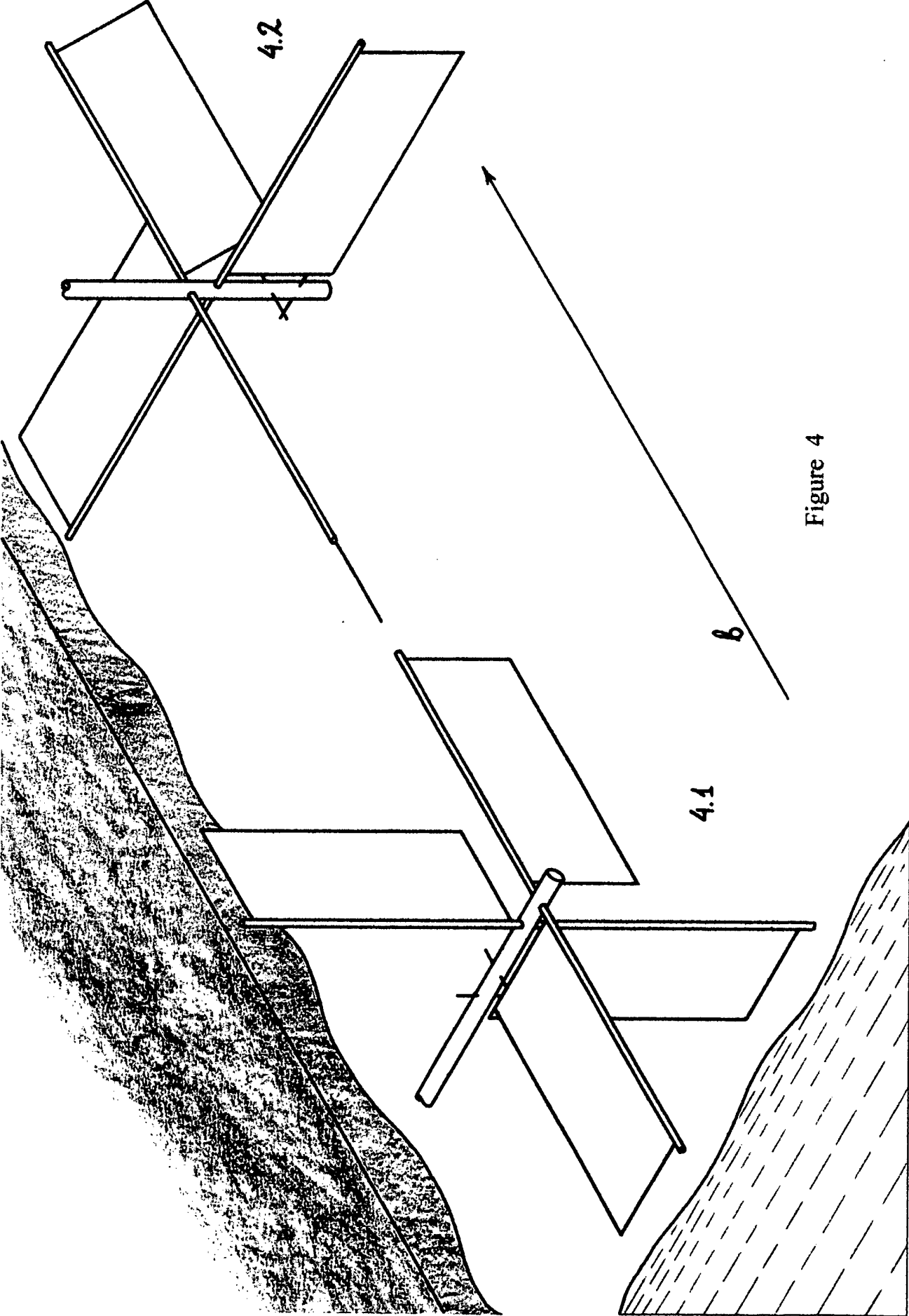


Figure 4

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GR 02/00041

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 F03D3/06 F03B17/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F03D F03B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	figures	4
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X	US 1 809 919 A (TURNER ROBERT S) 16 June 1931 (1931-06-16) page 1, line 1 - line 25 page 2, line 5 - line 10	1,2,4
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- *&* document member of the same patent family

Date of the actual completion of the international search

24 September 2002

Date of mailing of the international search report

01/10/2002

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INTERNATIONAL SEARCH REPORT

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tional Application No
PCT/GR 02/00041

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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