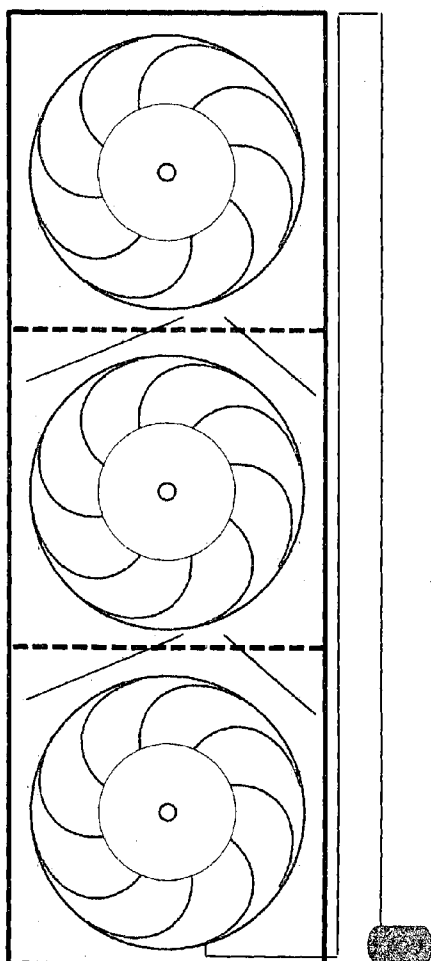




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Bangkok 10510 (TH).
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[Continued on next page]

(54) Title: GENERATOR



(57) Abstract: A generator includes a turbine with blades (2), a reservoir (7), an air pump (3), an air tube (4) and a dynamo (5). Water is filled in the reservoir (7) and the turbine is submerged in water. Air is pumped into the air tube (4) beneath the blades by the air pump (3) and is delivered to the water. The blades (2) are rotated by the air delivered into the water so as to rotate the dynamo (5) to produce electricity.



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TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

Invention detail

Title of Invention GENERATOR

Relevant science of the invention

5 Mechanical and electrical engineering

Background of the relevant arts or science

Nowadays, energy sources are presenting themselves as problems to mankind. For household and industrial facilities, electricity production nowadays relies on hydroelectric
10 dams, coal, oil, and nuclear power, solar energy or wind, etc. These energy sources either progressively diminish or generate too much pollution. For example, the construction of new hydroelectric dam is quite difficult due to the impact on the environment. Additionally, the coal- generated electricity plants pollute the air so that the anti-coal plant campaign is carried out by neighboring communities. Similarly, the nuclear power plant is protested against due to
15 the radiation leaks and frequent explosion of the plants. The electricity production by solar cells has higher cost and can be produced only when the sun is out. Even the production of electricity from wind turbines is similarly difficult because electricity can be produced only when the wind is strong. Also there are resistances from communities due the noise pollution caused by rotation of the rotor, flashing lights caused by rotating rotor which affect the nearby
20 residents and obstruct the scenery.

Characteristics and purpose of the invention

This invention is intended to produce electricity without having to rely on external fuel sources or not to create any pollution and can generate energy by itself. The invention works
25 on the power of the air buoyancy in the water as water-driven turbine to power the generator producing electricity. The process begins by pumping air underneath the turbine blades and

the air underneath the turbine blades will support the continuous rotation of the turbine. Numerous water sources can be found such as canals, rivers, treated water from household use or industry plants and sea water. In this case, the oxygen level in these water sources will beneficially be increased and the water is additionally treated. This system does not encourage
5 water loss because the water is saved in reservoir unlike the hydroelectric dam. However the water may evaporate but not too much, so the invention produces an efficient use of water. The invention can accommodate the industry plant, distant communities, and households and can be fashioned as portable electric generator.

10 Complete disclosure of the invention

This generator has 12 key components: turbine, shaft axis, magnetic seal, air pump, air tube, dynamo, reduction gear, chain sprocket, chain, reservoir and water. The air is pumped into the water underneath the turbine by air pump. The pumped air stays afloat underneath the turbine blades and drives the turbine, designed to keep the air inside. When the first turbine
15 blade moves, the pumped air will fill the next blades and generate continuous propulsion. A set of submerged turbine blades will prevent resistance in the process of the turbine spinning up to the top and down. The turbine blade has a curve design with the purpose of reducing the resistance of water. The pumped air inside the turbine blades, allowing the turbine to rise, will be released before the turbine spins down. The shaft axis of the turbine protruding outside
20 the reservoir is sealed to prevent water leakage. The shaft enhances the reduction gear rotation faster at the speed of 1500 rpm in order to propel the generator.

The amount of air pumped into the turbine within 1 – 2 seconds equals the volume of air filling one turbine blade. To achieve maximum effectiveness of the turbine, at first, we use external electricity or battery to power the air pump to pump air inside the reservoir. After the
25 turbine blade starts to rotate and propels the dynamo which generates power to the air pump or some of the produced electricity will be reserved in the battery and can power the air pump continuously. This generator will continue to run by itself without relying on external fuel sources.

To enhance the power production, we can use multiple turbine sets and reservoirs, stacking up on a vertical line. The pumped air propelling each turbine set will create propulsion that drives the set of reduction gear interconnected with sprocket. This will add momentum to the bottom set of turbine connected to the reduction gear and dynamo and helps
5 generate more electricity.

The 2 control pads angled at 30-45 ° placed on top of the turbine blades will control the air navigation up to the turbine blade (as shown in the illustration).

Brief description of drawings

- 10 1. Turbine blades are curved as shown and attached to a large round tube. The length of the turbine blades is equal to that of the tube with the side cover.
2. shaft axis of the turbine blade
3. air pump
4. air tube
- 15 5. dynamo
6. reduction gear
7. reservoir
8. water
9. control pad
- 20 10. chain sprocket
11. chain
12. mechanical seal

Best Mode for Carrying out the Invention

- 25 As disclosed in the complete disclosure of the invention

Claims

1. The generator uses dynamo propulsion to produce electricity from the rotation of the turbine submerged in water. Turbine is rotated by the air inside the turbine blade. The air is pumped into the air tube. Naturally, the air will rise to the top. The blade filled with the air will move upward, the next blade will replace it and so on. When the turbine spins up to the top, the air beneath it will float away before the turbine blade rotate back into the water. This creates continuous rotation of the turbine blades.
2. A form of turbine blades can be specified in claim 1. It is designed to provide optimum air entrapment. The turbine blades are attached to the shaft axis. Although there is some air escaping from the first turbine blade, the escaping air will float up into the above one over and over again. The curve turbine blade is designed to reduce the resistance in the water when rotating down and has side covers to ensure optimum air entrapment. This will allow the air to escape faster once the blade reaches the highest point and there will be no air left inside. The set of turbine blades is fully submerged in order to reduce the resistance and enhance the continuous downward rotation. The size of the turbine blade depends on the amount of power needed. The number of turbine blade should be at least 8, depending on the diameter of the turbine. The blade number shall be increased according to the size of the turbine diameter. The more the cavity inside the blade is extended, the more the propulsion is enhanced. The full set of turbine blade is attached to the shaft axis which is attached to the reservoir. The shaft axis is protruding out off the reservoir with the magnetic seal to prevent water leakage. The axis connected to the reduction gear is used to increase the speed up to 1,500-1,800 rpm in order to propel the dynamo. The reservoir is filled with water to cover the blades.
3. The turbine blade and reservoir can be stacked vertically in a rack. The pumped air propelling each turbine set will create propulsion that drives the set of reduction gear interconnected with sprocket. This will add momentum to the bottom set of

turbine connected to the reduction gear and dynamo and helps generate more electricity. The axis of the turbine shaft extending outside the reservoir will propel the chain sprocket. The interconnected looped chain enhances the superior propulsion force.

5

4. Aeration pumps specified in claim 1, is equipped with the air intake pipe under the turbine blade. The size of the force of the air pump equals the volume of air. It is important to have the capacity to pump air within 1-2 seconds to retain the air of one turbine blade.

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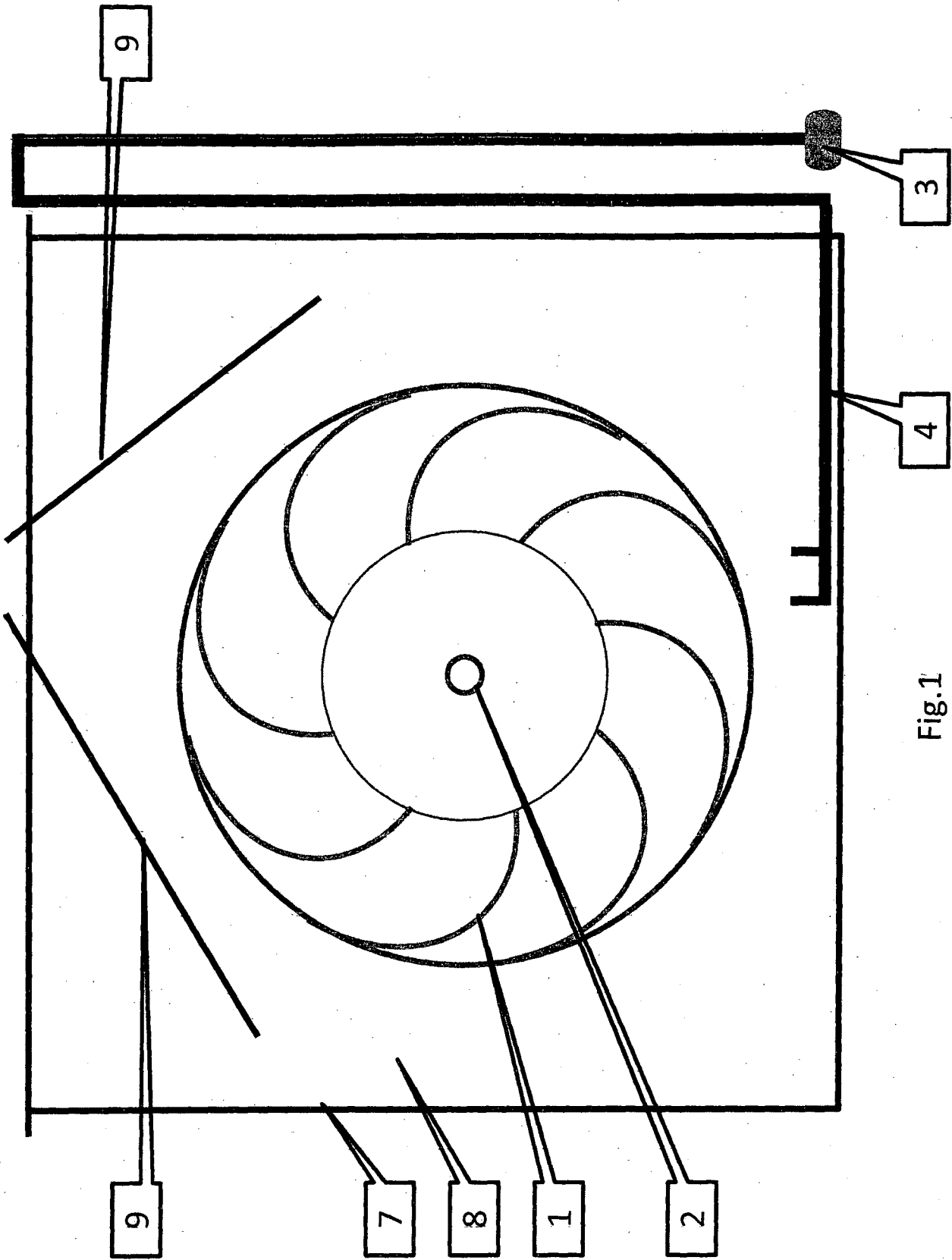


Fig.1

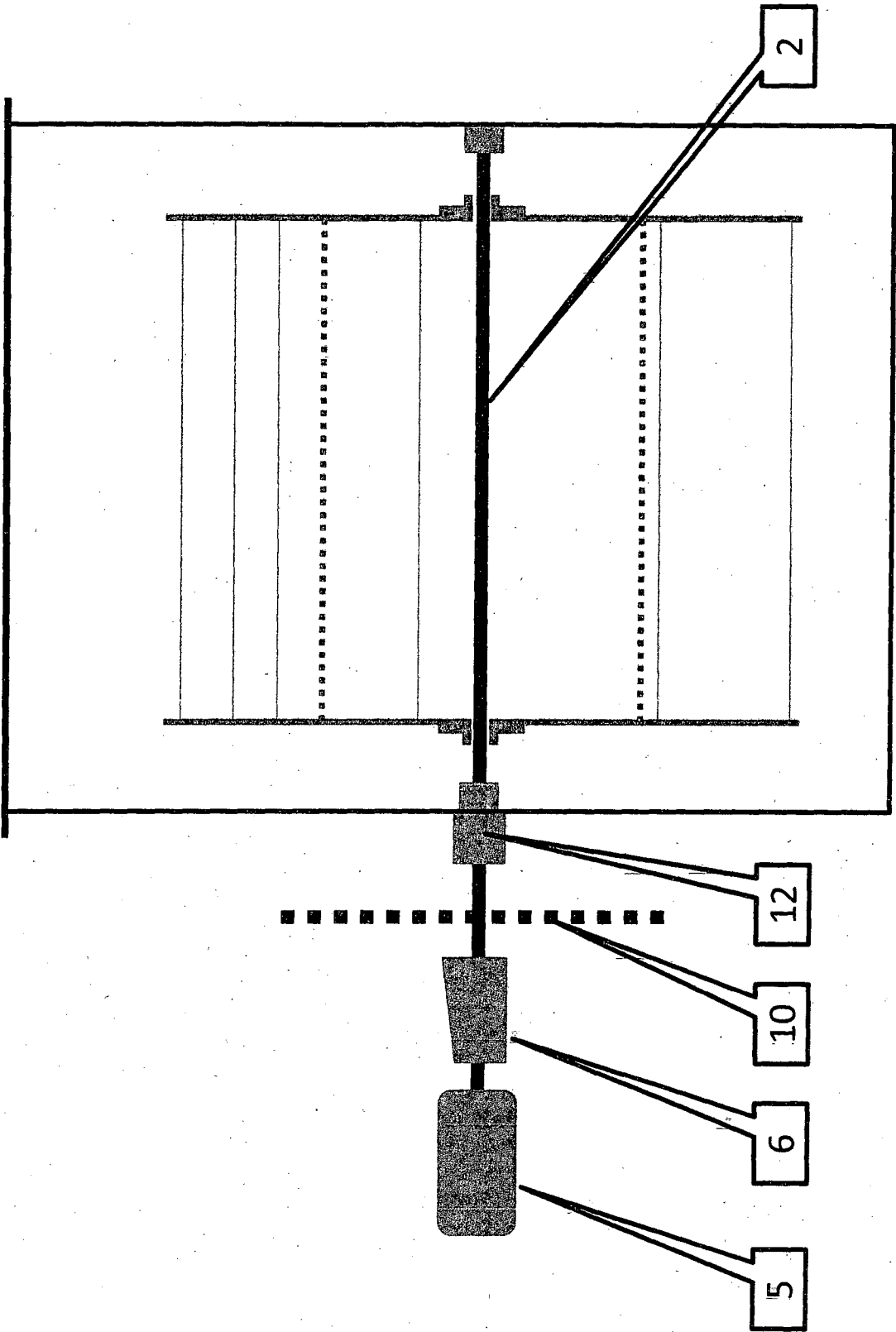


Fig.2

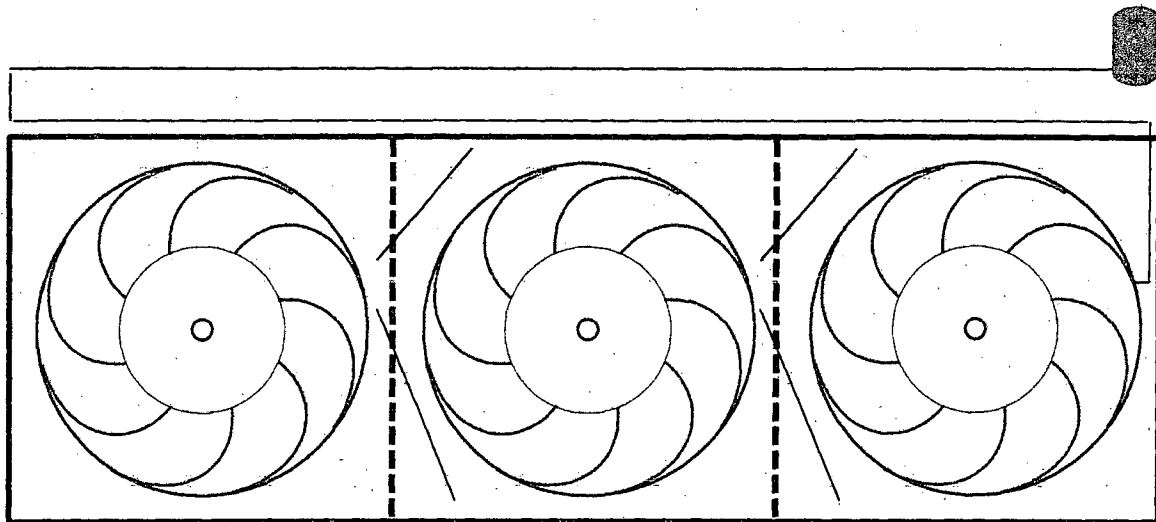


Fig. 4

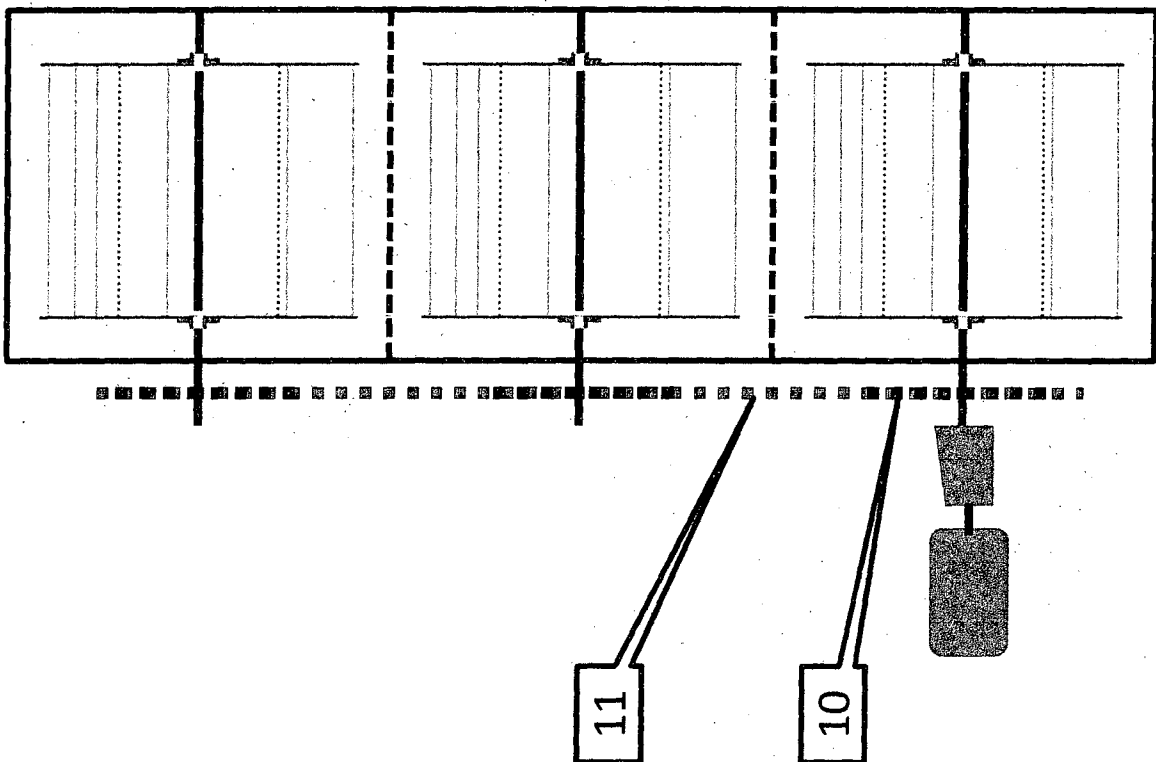


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/TH2012/000048

A. CLASSIFICATION OF SUBJECT MATTER

See the extra sheet

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: F03G, 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 practicable, search terms used)

WPI, EPODOC, CNPAT, CNKI, generator, water, air, gas, pump, submerge, blade, vane, turbine

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2000220564 A (KATO HIROMOTO) 08 August 2000 (08.08.2000) description, paragraphs 0005-0007 and figures 1-3	1
A	CN 101255855A (CHEN, Yiming) 03 September 2008 (03.09.2008) the whole document	1
A	GB 2443697 A (SIDALL ROBERT JAMES) 14 May 2008 (14.05.2008) the whole document	1

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
“A” document defining the general state of the art which is not considered to be of particular relevance	“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
“E” earlier application or patent but published on or after the international filing date	“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
“L” document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)	“&” document member of the same patent family
“O” document referring to an oral disclosure, use, exhibition or other means	
“P” document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
01 July 2013(01.07.2013)Date of mailing of the international search report
11 Jul. 2013 (11.07.2013)Name and mailing address of the ISA/CN
The State Intellectual Property Office, the P.R.China
6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China
100088
Facsimile No. 86-10-62019451Authorized officer
LIU, Yani
Telephone No. (86-10)62085290

INTERNATIONAL SEARCH REPORT

International application No.

PCT/TH2012/000048

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

There are four inventions in the present international application. Independent claim 1 relates to a generator; independent claim 2 relates to a turbine blade; independent claim 3 relates to a turbine blade and reservoir; independent claim 4 relates to an aeration pump. Same or corresponding technical features between claim 1 and claims 2-4 are common knowledges in the art and hence are prior art. Consequently, claim 1 and claims 2-4 do not share a same or corresponding special technical feature that makes a contribution over the prior art. These inventions are not so linked as to form a single general inventive concept. Therefore, the application does not satisfy the requirement of unity of invention as defined in PCT Rule 13.1.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos. 1:

Remark on protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/TH2012/000048

A. CLASSIFICATION OF SUBJECT MATTER

F03G 7/00 (2006.01) i

F03B 1/04 (2006.01) i

International application No. PCT/TH2012/000048
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Form PCT/ISA /210 (patent family annex) (July 2009)