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BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
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KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA,
MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG,
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GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to the identity of the inventor (Rule 4.17(i))
- as to applicant's entitlement to apply for and be granted a
patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the
earlier application (Rule 4.17(iii))

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- with international search report (Art. 21(3))
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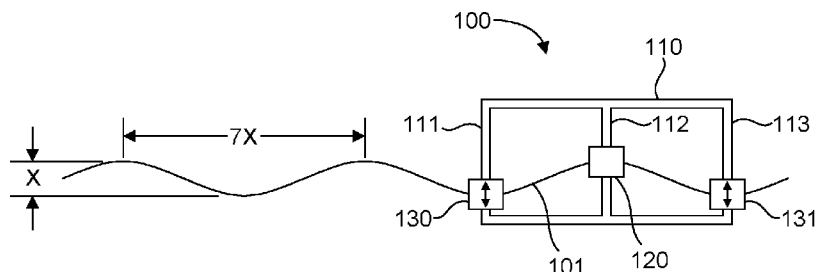


FIG. 1

(57) Abstract: An energy conversion device is disclosed. The energy conversion device can include a magnetic field producing element, and a coil having a coil axis. The magnetic field producing element and the coil can be movable relative to one another in a movement plane. The coil axis can be substantially perpendicular to the movement plane.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 17/19633

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - F03B 13/14, F03B 13/20, F03B 13/12, E02B 9/08, H02K 1/27, H02K 21/14 (2017.01)
CPC - F03B13/14, F03B13/20, Y02E10/38, F03B13/10, F03B13/12, F03B13/18, F03G3/06, F16L1/20, F16L1/24, F16L11/133, H01B7/00, H01B7/0072, H02G9/00, H02G1/10, H02G9/12, F16L1/15, F05B2220/7068, F05B2220/707, F05B2260/406, F05B2270/18, Y02E10/38, Y02E10/22, E02B9/08, F03B13/00, F03D11/04, H02K53/00, H02K1/27, H02K21/14

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)

See Search History Document

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

See Search History Document

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

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,731,676 A (Nakamats) 24 March 1998 (24.03.1998), entire document, especially Fig. 1; col 3, ln 54-56; col 3, ln 63-65; col 4, ln 14-27;	1-5, 15-16, 19
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Y		6, 12-14
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A		7-11, 17-18
Y	US 5,105,111 A (Luebke) 14 April 1992 (14.04.1992), entire document, especially Fig. 2, 9; col 5, ln 8-13;	6, 12-14
A	US 5,436,518 A (Kawai) 25 July 1995 (25.07.1995), entire document, especially Fig. 7; col 9, ln 9-21;	7-11, 17
A	US 2014/0152014 A1 (Fait) 05 June 2014 (05.06.2014), entire document, especially Fig. 1; para[0020];	18
A	US 6,013,963 A (Shelton, Jr.) 11 January 2000 (11.01.2000), entire document	1-19
A	US 2014/0368095 A1 (Kamibayashi) 18 December 2014 (18.12.2014), entire document	1-19
A	US 2009/0160391 A1 (Flynn) 25 June 2009 (25.06.2009), entire document	1-19
A	US 2016/0006304 A1 (Tojima et al.) 07 January 2016 (07.01.2016), entire document	1-19
X, P	US 2016/0186715 A1 (Fait) 30 June 2016 (30.06.2016), entire document	1-19

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"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)

"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

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

18 July 2017

Date of mailing of the international search report

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Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 17/19633

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:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-19 directed to an energy conversion device.

Group II: Claims 20-21 directed to a method for protecting animals in a region about a wave energy conversion device installation.

Group III: Claims 22-25 directed to a method for minimizing damage to a wave energy conversion device from a harmful surface condition.

--- continued in supplemental box ---

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 additional fees, this Authority did not invite payment of additional fees.
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.:
1-19

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.

--- continuation of Box No. III Observations where unity of invention is lacking ---

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical feature of an energy conversion device having a magnetic field production element, and a coil having a coil axis, not required by the claims of Group II and III.

The invention of Group II includes the special technical feature of a method for protecting animals in a region about a wave energy conversion device installation including providing a first sonic warning to a first level below, and providing a second sonic warning to a second level below, not required by the claims of Group I and III.

The invention of Group III includes the special technical feature of a method for minimizing damage to a wave energy conversion device from a harmful surface condition including detecting a harmful surface condition, submerging the wave energy conversion device below water, determining the harmful surface condition is ineffective, and surfacing the wave energy conversion device, not required by the claims of Group I and II.

COMMON TECHNICAL FEATURES

Groups I-III share the common technical features of an energy conversion device.

However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2014/0152014 A1 (Fait), which Fait discloses an energy conversion device (100, Fig. 1; para[0020], 'an array of buoys 100 for obtaining energy from a wave 101 in a body of water').

Groups II-III share the common technical features of a wave energy conversion device.

However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2014/0152014 A1 (Fait), which Fait discloses a wave energy conversion device (100, Fig. 1; para[0020], 'an array of buoys 100 for obtaining energy from a wave 101 in a body of water').

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-III lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.