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(12) **United States Patent**
**Hayamizu**

(10) **Patent No.: US 12,392,314 B2**
(45) **Date of Patent: Aug. 19, 2025**

(54) **POWER GENERATION SYSTEM**


(71) Applicants: **Global Energy Harvest Co.**, Mitaka (JP); **Kohei Hayamizu**, Mitaka (JP); **Hayamizu Urban Environmental Development Corporation**, Mitaka (JP); **Hayamizu Energy Harvesting Project Corporation**, Mitaka (JP)

(72) Inventor: **Kohei Hayamizu**, Mitaka (JP)


( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.


(21) Appl. No.: **18/640,173**

(22) Filed: **Apr. 19, 2024**

(65) **Prior Publication Data**

US 2024/0263607 A1 Aug. 8, 2024

**Related U.S. Application Data**

(63) Continuation-in-part of application No. PCT/JP2021/038539, filed on Oct. 19, 2021.

(51) **Int. Cl.**
***F03B 13/16*** (2006.01)
***F03B 13/22*** (2006.01)

(52) **U.S. Cl.**
CPC .............. ***F03B 13/16*** (2013.01); ***F03B 13/22*** (2013.01); *F05B 2220/706* (2013.01); *F05B 2240/93* (2013.01)

(58) **Field of Classification Search**
CPC .... F03B 13/16; F03B 13/22; F05B 2220/706; F05B 2240/93
See application file for complete search history.


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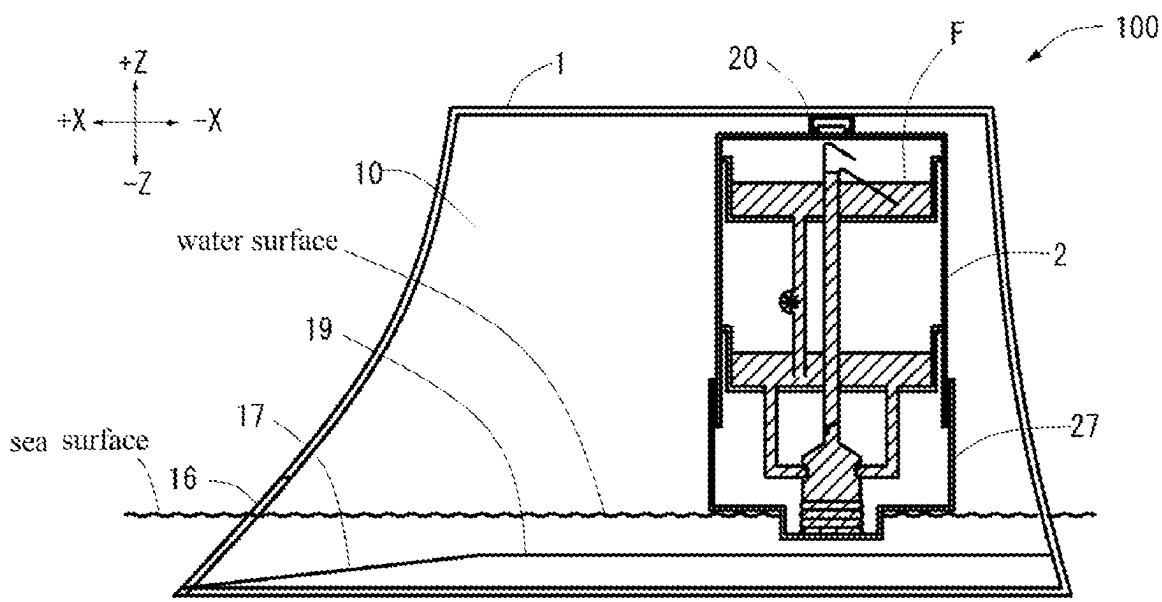
*Primary Examiner* — Viet P Nguyen
(74) *Attorney, Agent, or Firm* — Brian J. Colandreo; Jeffrey T. Placker; Holland & Knight LLP

(57) **ABSTRACT**


There is provided a power generation device that generates electricity using a potential energy of a fluid raised to a predetermined height position by a wave force, the device including: a housing (**1**) that floats, the housing (**1**) including a front side opening portion (**16**) for taking a wave into an inside of the housing (**1**) on a front side of the housing (**1**); a float accommodated in the housing (**1**); a feeding device that feeds the circulation fluid toward the predetermined height position based on a wave force received by the float due to the wave taken into the inside of the housing (**1**) through the front side opening portion (**16**); a power generation unit that generates the electricity; and a suppressing member that suppresses a swing of the housing (**1**).


**15 Claims, 29 Drawing Sheets**



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| WO | WO-2020170194 | A1 * | 8/2020 | F03B 13/22 |

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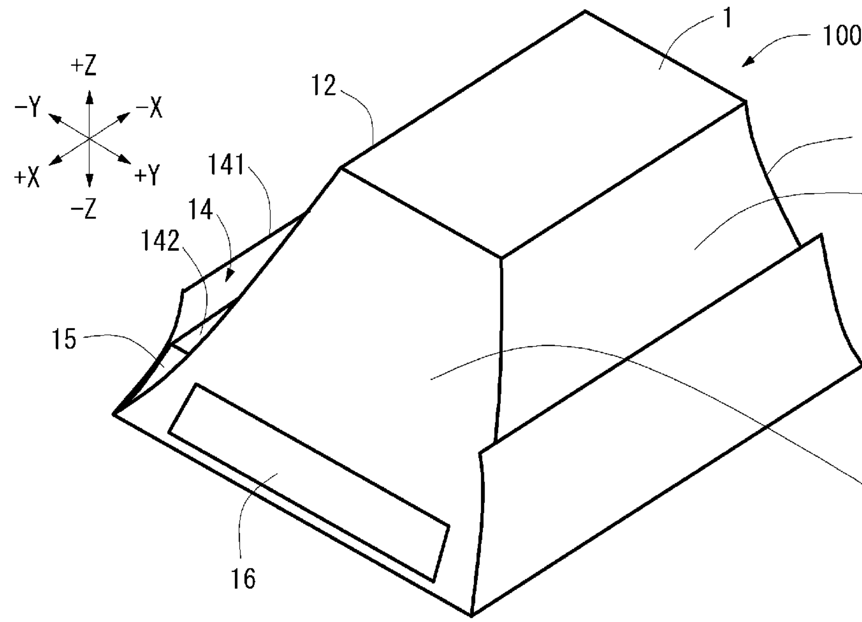
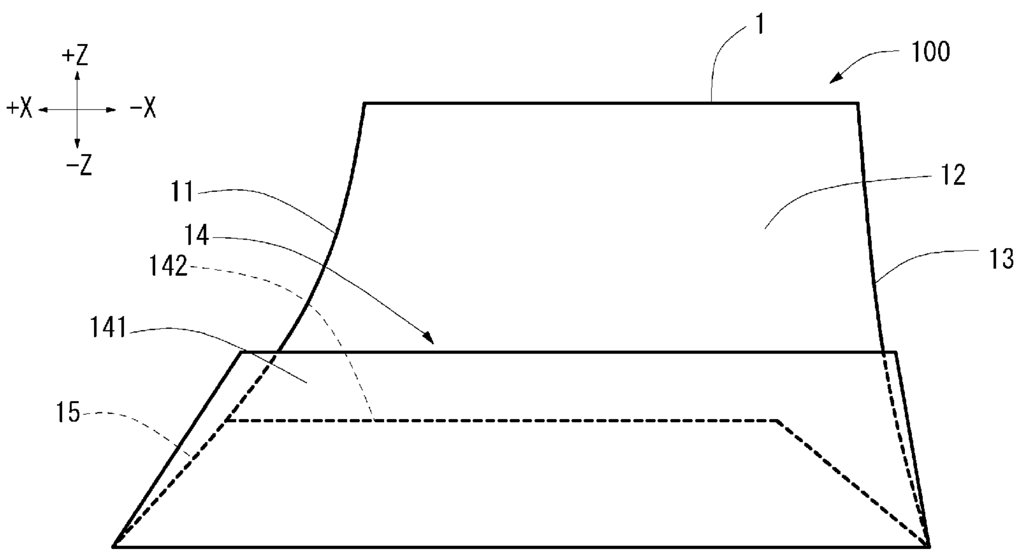
[Fig.1]


+Z
−Y
−X
+X
+Y
−Z
1
100
12
13
12
141
14
142
15
11
16

[Fig.2]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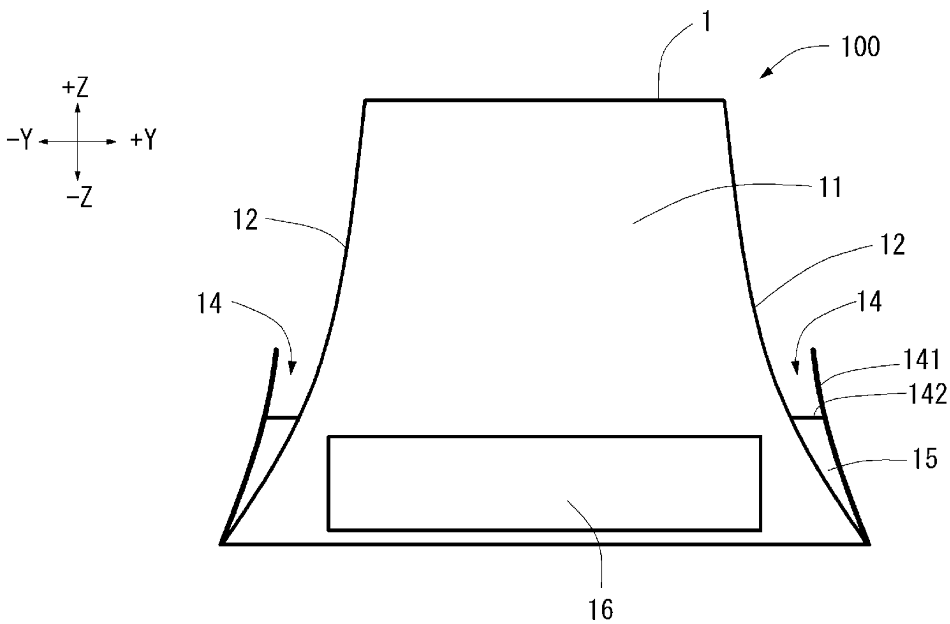
+X
−X
−Z
1
100
12
11
14
142
13
141
15

[Fig.3]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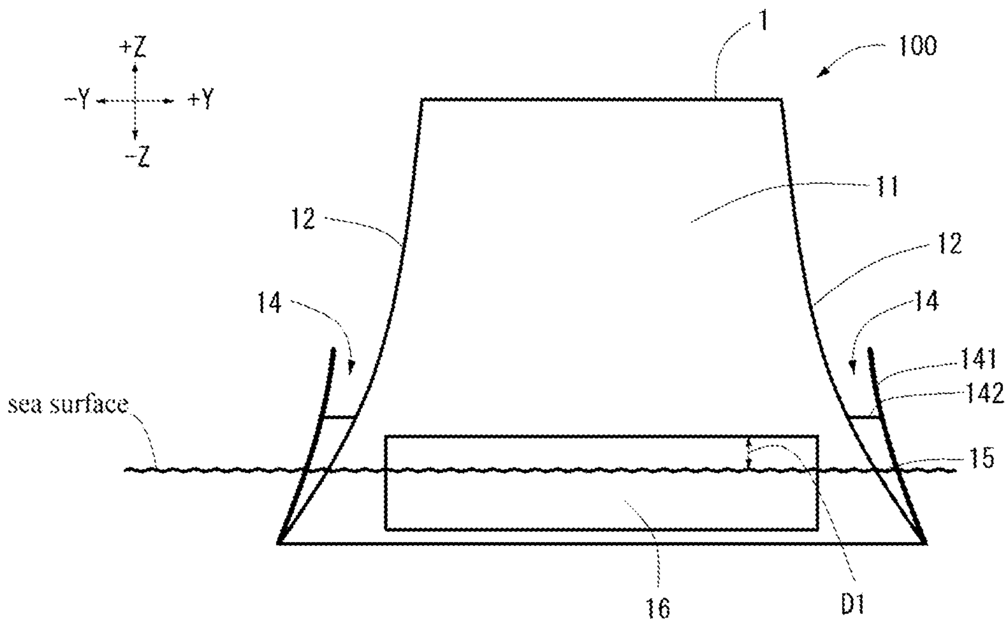
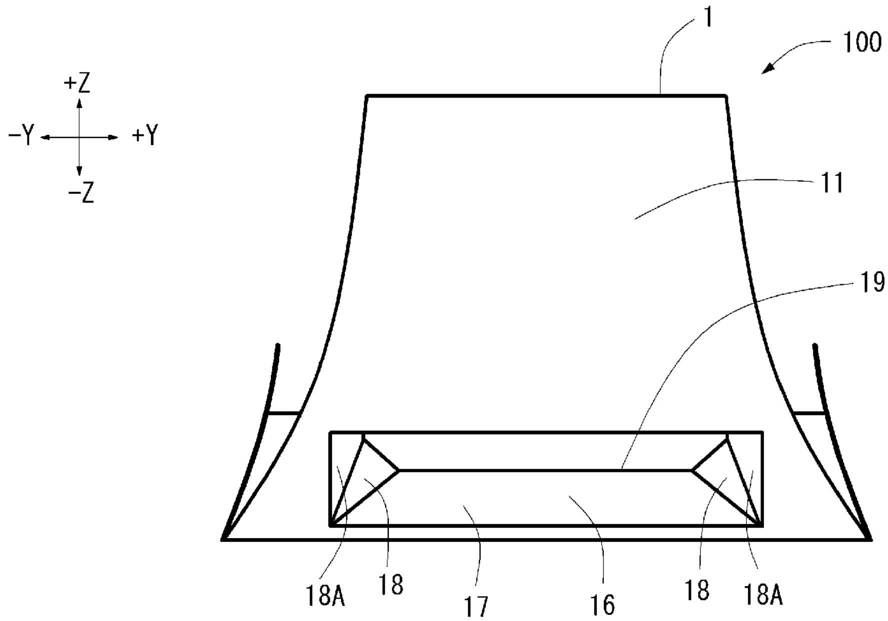
100
+Z
−Y
+Y
−Z
11
12
12
14
14
141
142
15
16

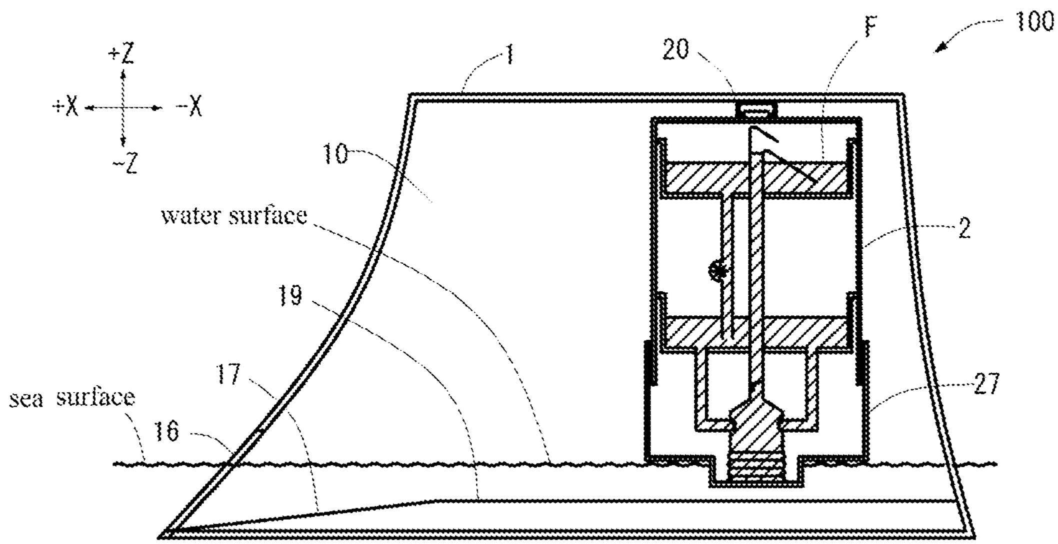
[Fig.4]


1
100
+Z
−Y
+Y
−Z
11
12
12
14
14
141
142
sea surface
15
16
D1

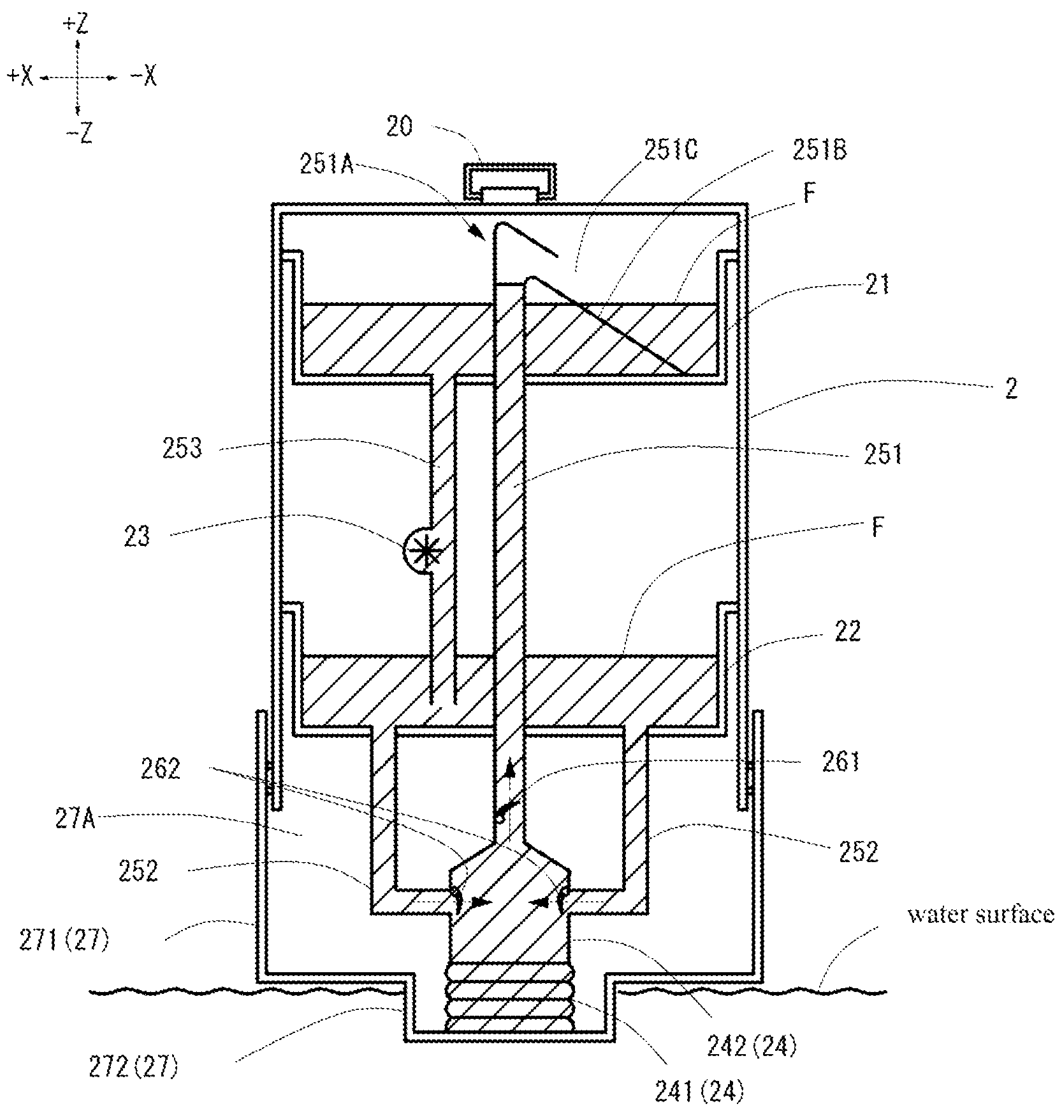
[Fig.5]


+Z
−Y
+Y
−Z
1
100
11
19
18A
18
17
16
18
18A

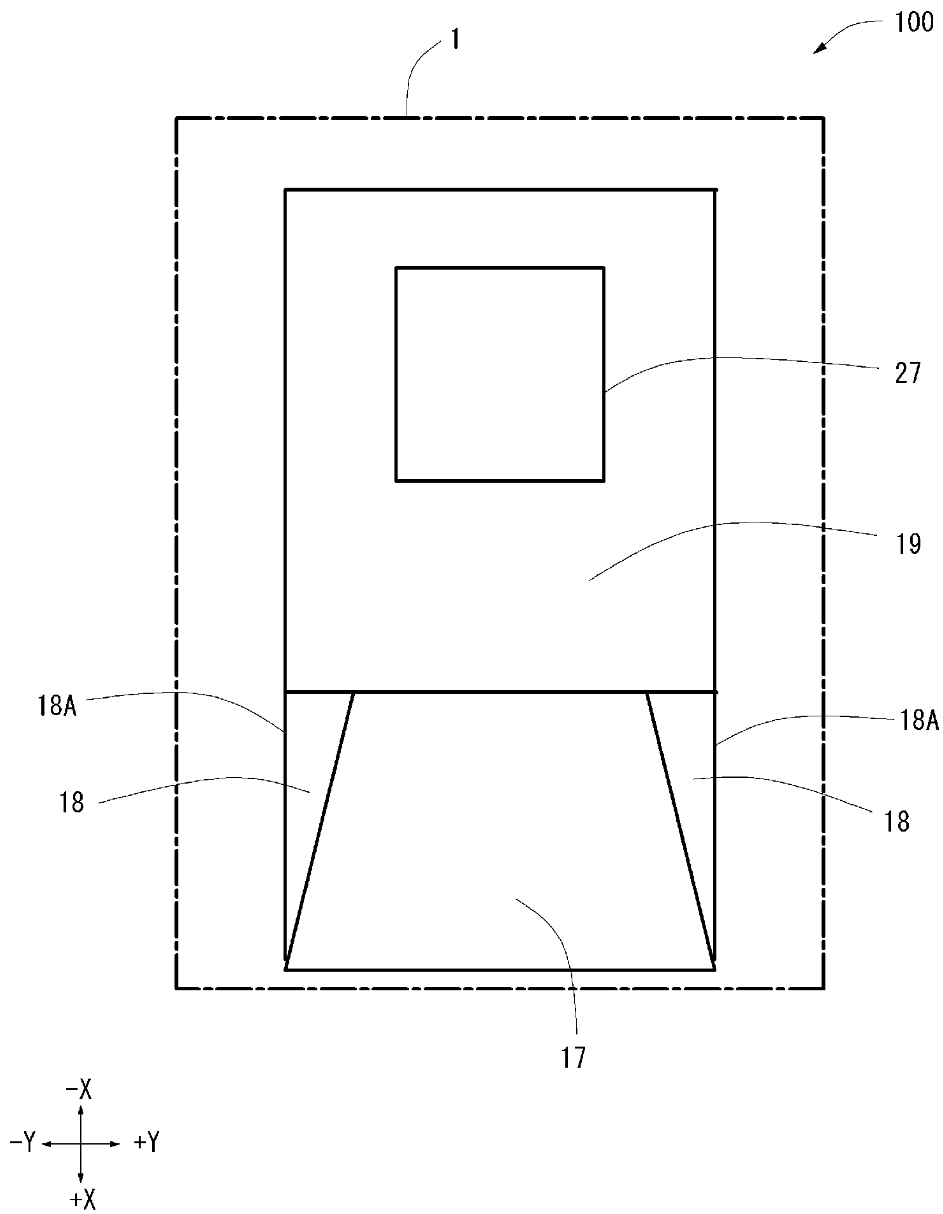
[Fig.6]


+Z
+X
−X
−Z
1
20
F
100
10
water surface
2
19
17
sea surface
16
27

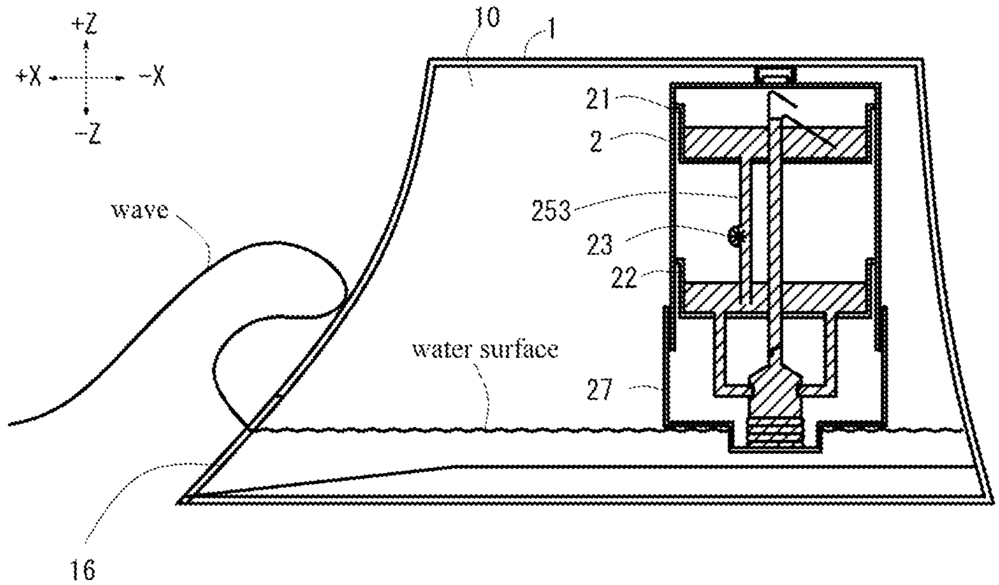
[Fig.7]


+Z
+X
-X
-Z
20
251A
251C
251B
F
21
2
253
251
23
F
22
262
261
27A
252
252
water surface
271 (27)
242 (24)
272 (27)
241 (24)

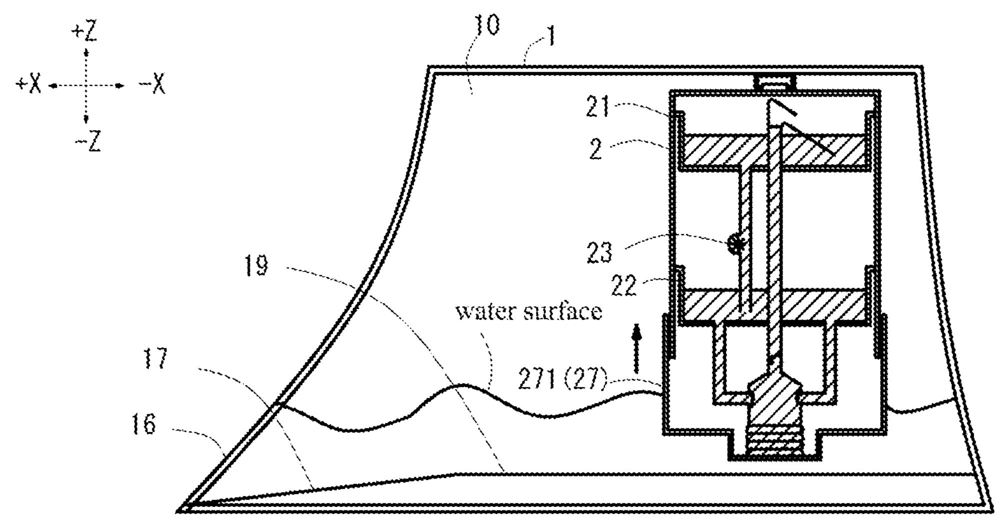
[Fig.8]



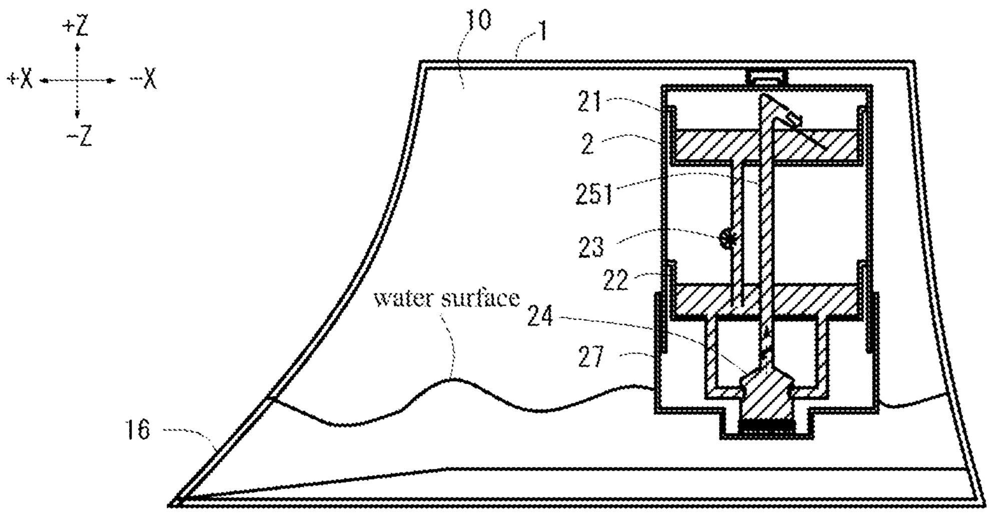
[Fig.9]


+Z
+X
-X
-Z
10
1
21
2
253
23
22
27
wave
water surface
16

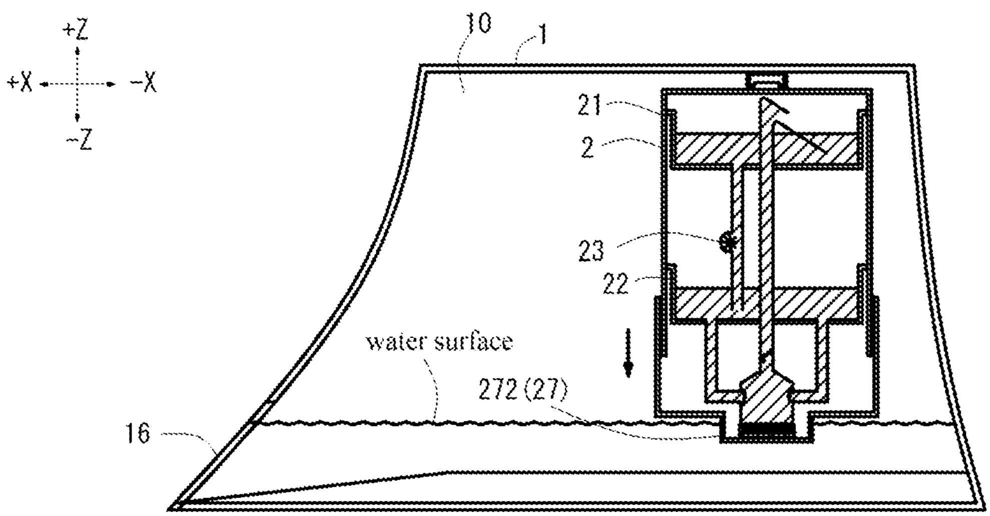
[Fig.10]


+Z
+X
-X
-Z
10
1
21
2
23
22
19
water surface
271 (27)
17
16

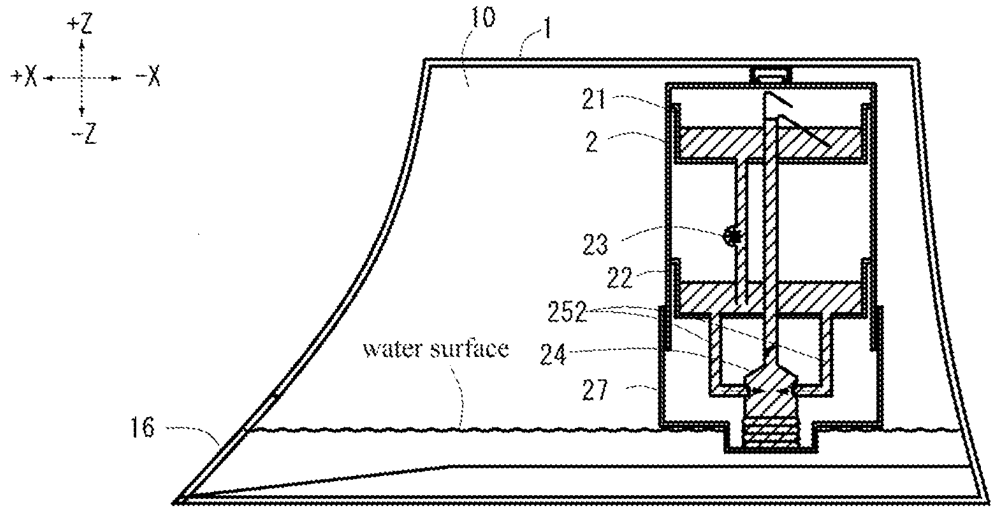
[Fig.11]


+Z
+X
-X
-Z
10
1
21
2
251
23
22
water surface
24
27
16

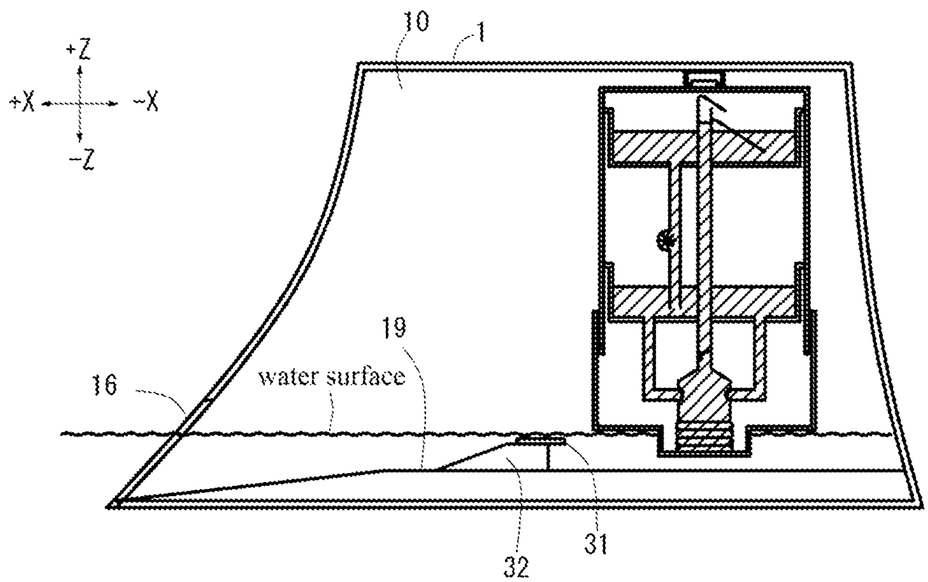
[Fig.12]


+Z
+X
-X
-Z
10
1
21
2
23
22
water surface
272 (27)
16

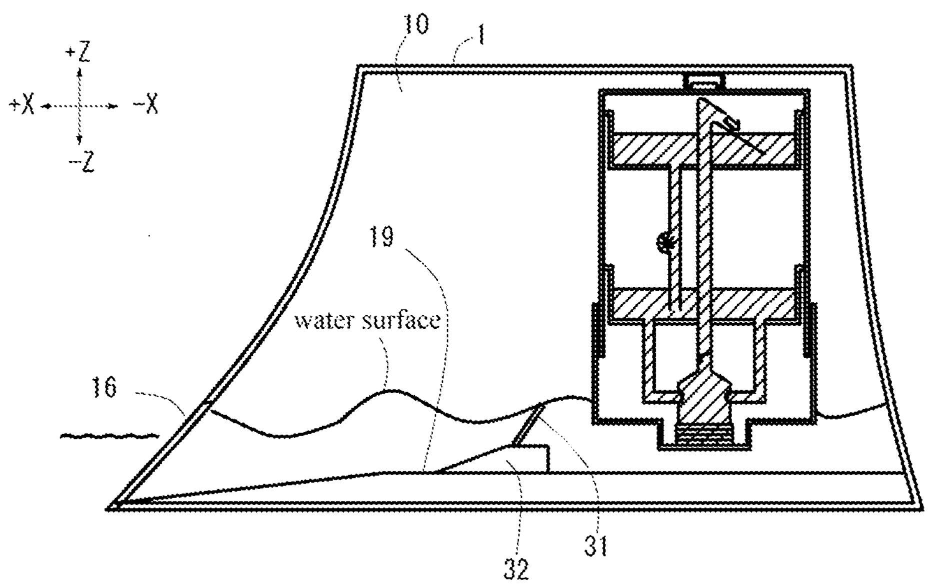
[Fig.13]


+Z
+X
-X
-Z
10
1
21
2
23
22
252
water surface
24
27
16

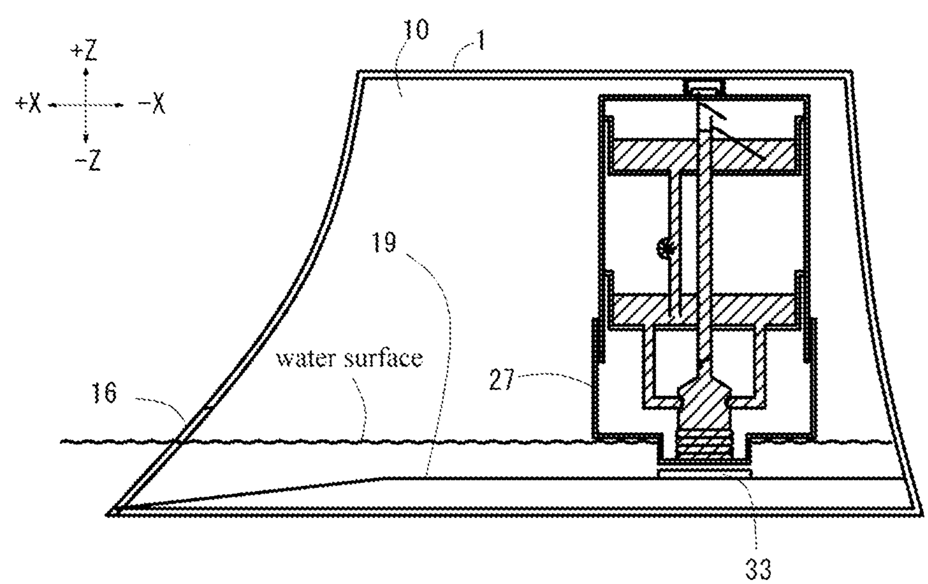
[Fig.14]


+Z
+X
-X
-Z
10
1
19
water surface
16
32
31

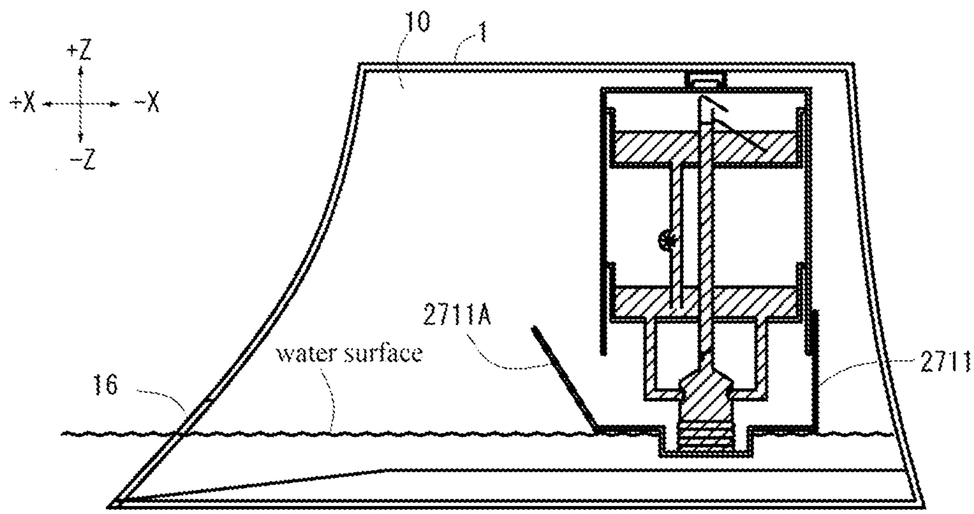
[Fig.15]


10
1
+Z
+X
-X
-Z
19
water surface
16
32
31

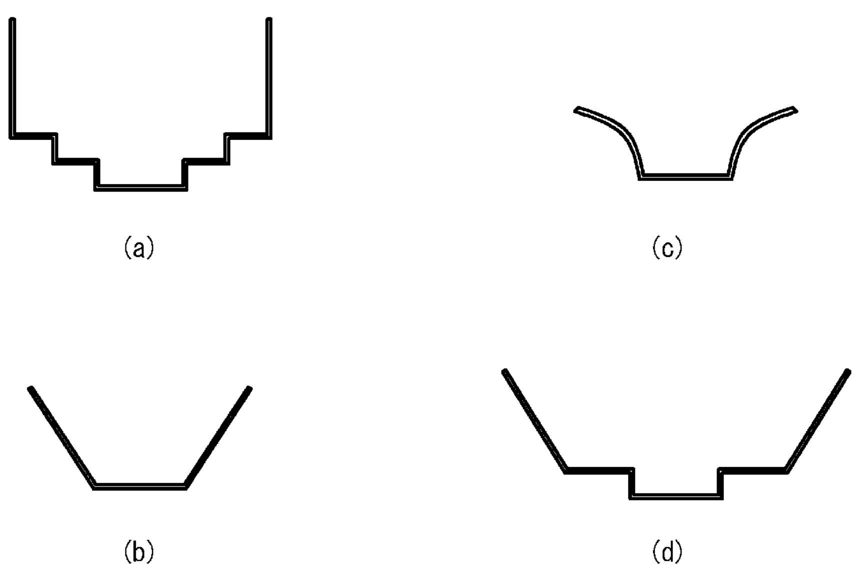
[Fig.16]


10
1
+Z
+X
-X
-Z
19
water surface
27
16
33

[Fig.17]




[Fig.18]



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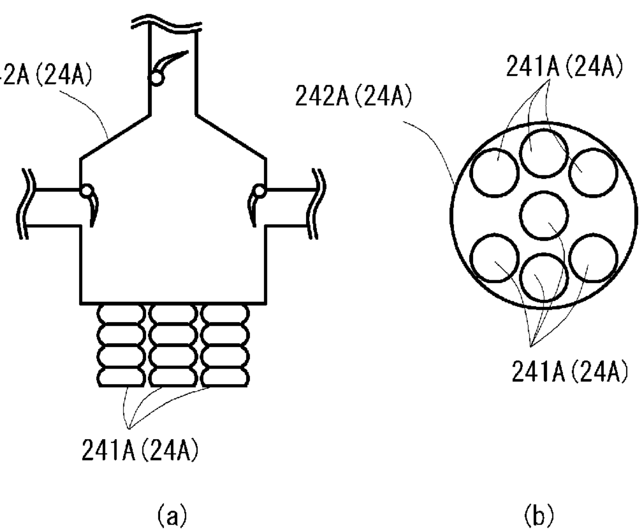
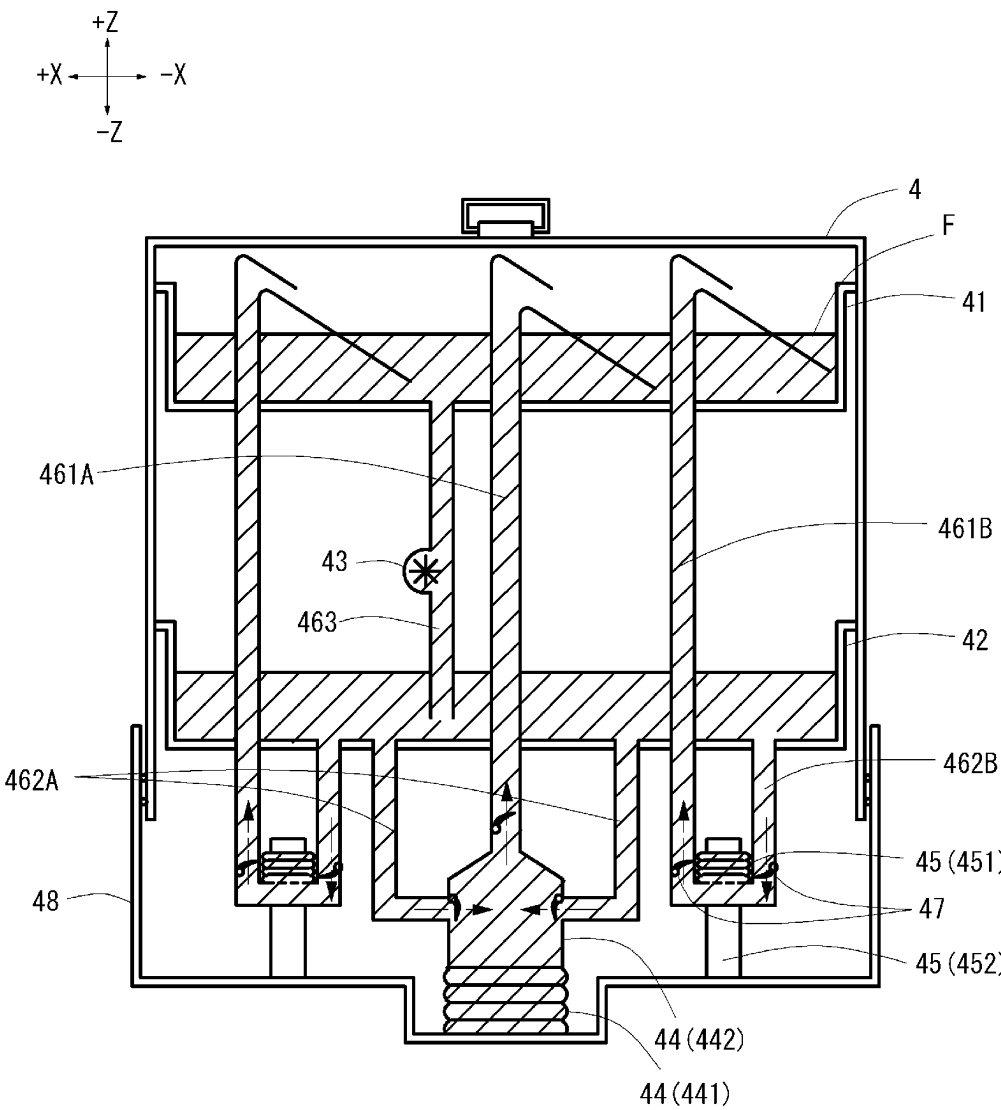
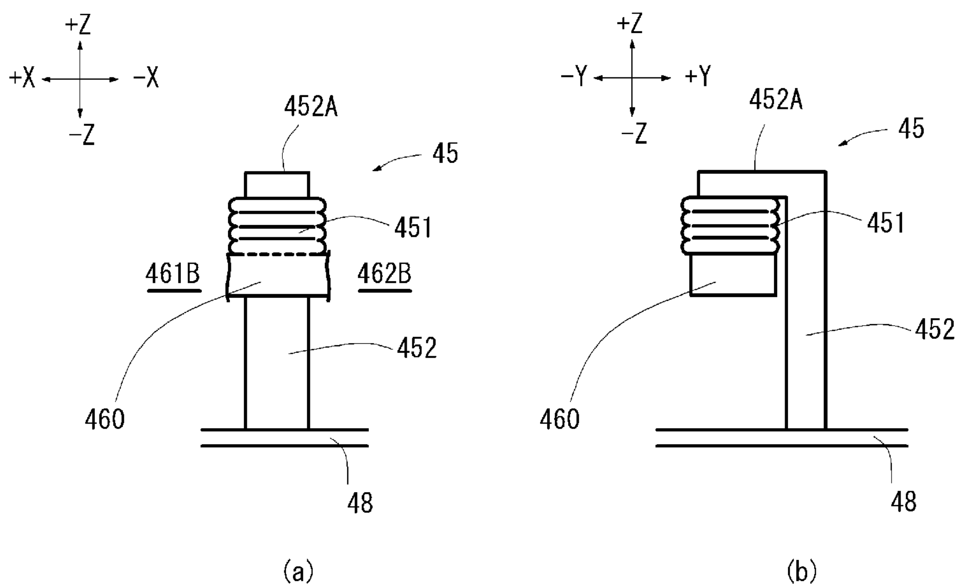


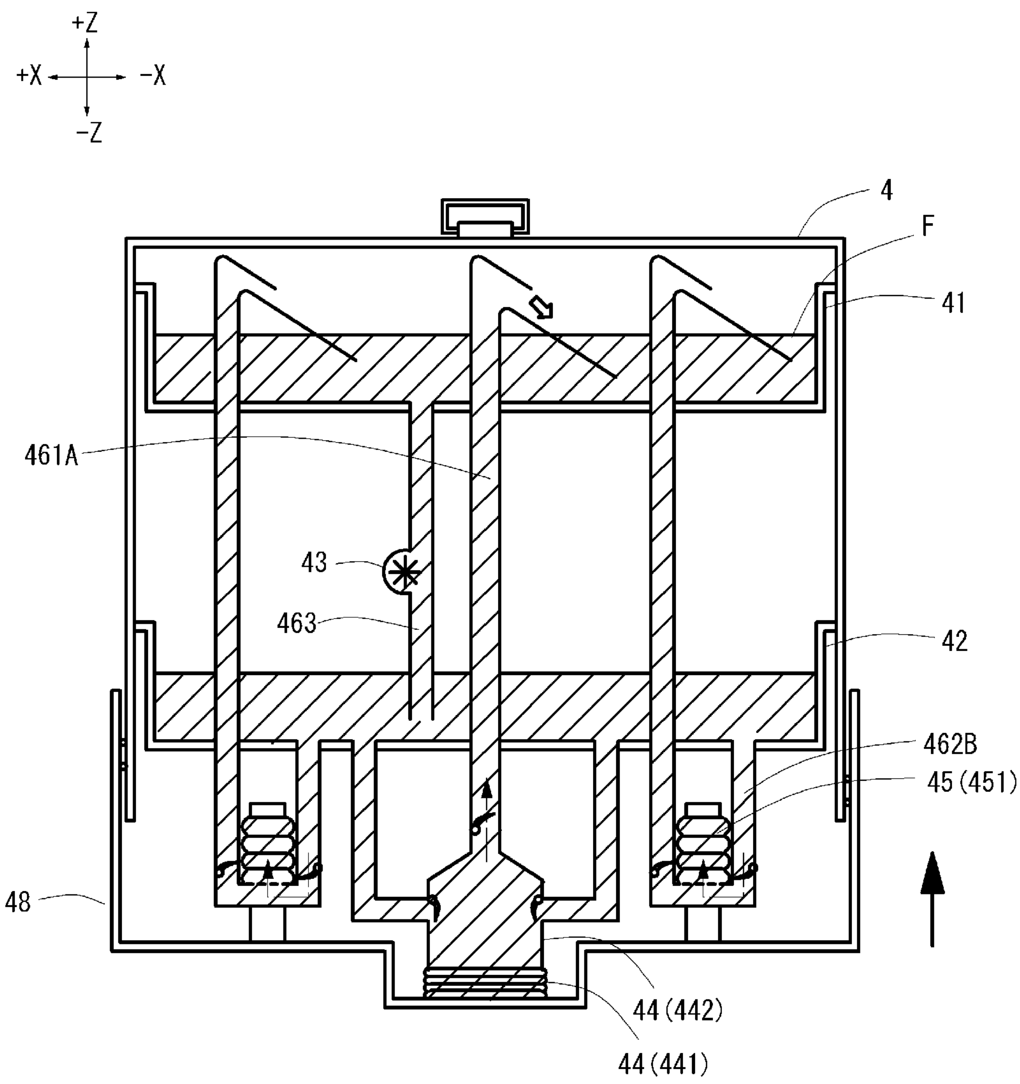
[Fig.20]


+Z
+X
-X
-Z
4
F
41
461A
461B
43
463
42
462A
462B
45 (451)
48
47
45 (452)
44 (442)
44 (441)

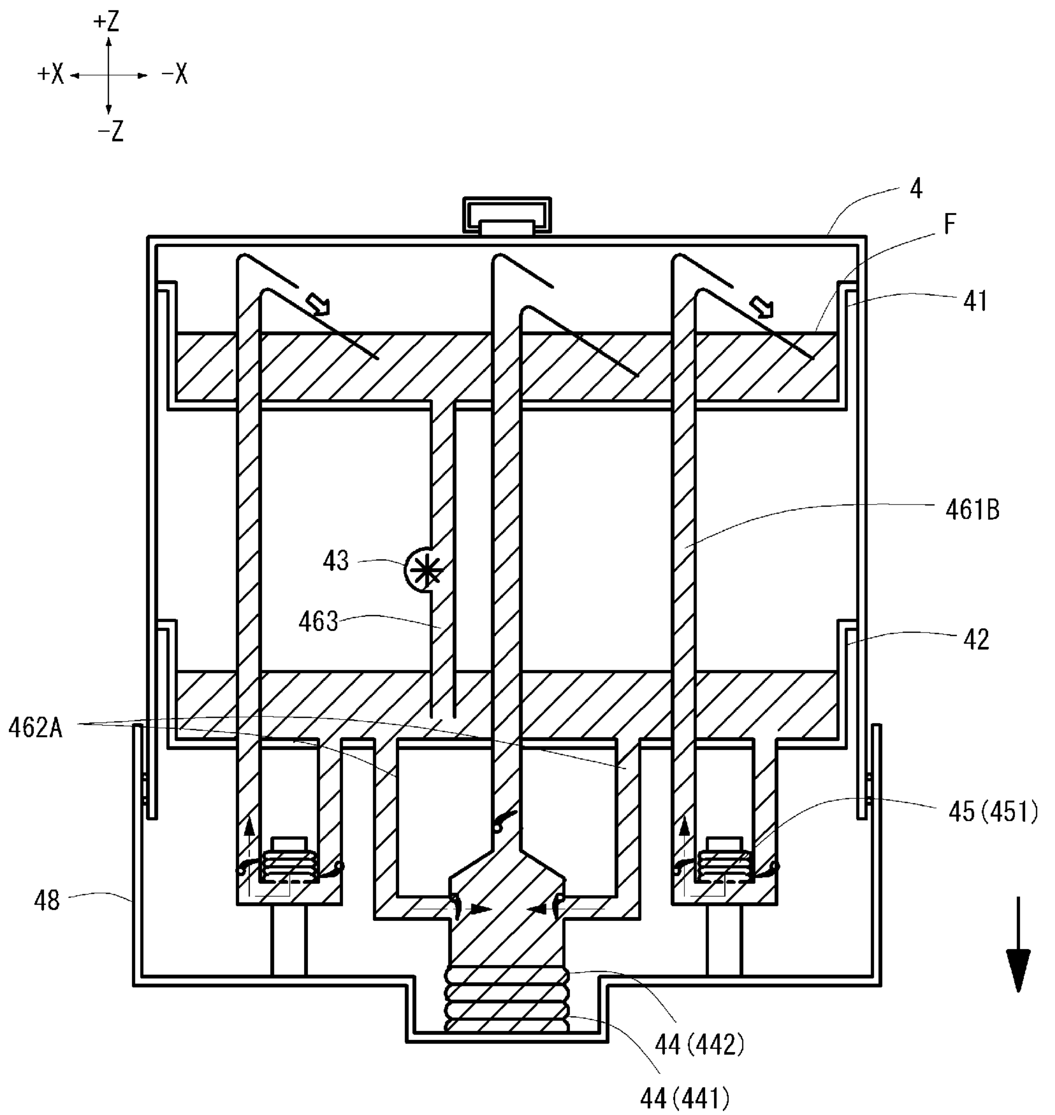
[Fig.21]


+Z
+X
-X
-Z
452A
45
451
461B
462B
460
452
48
(a)
+Z
-Y
+Y
-Z
452A
45
451
452
460
48
(b)

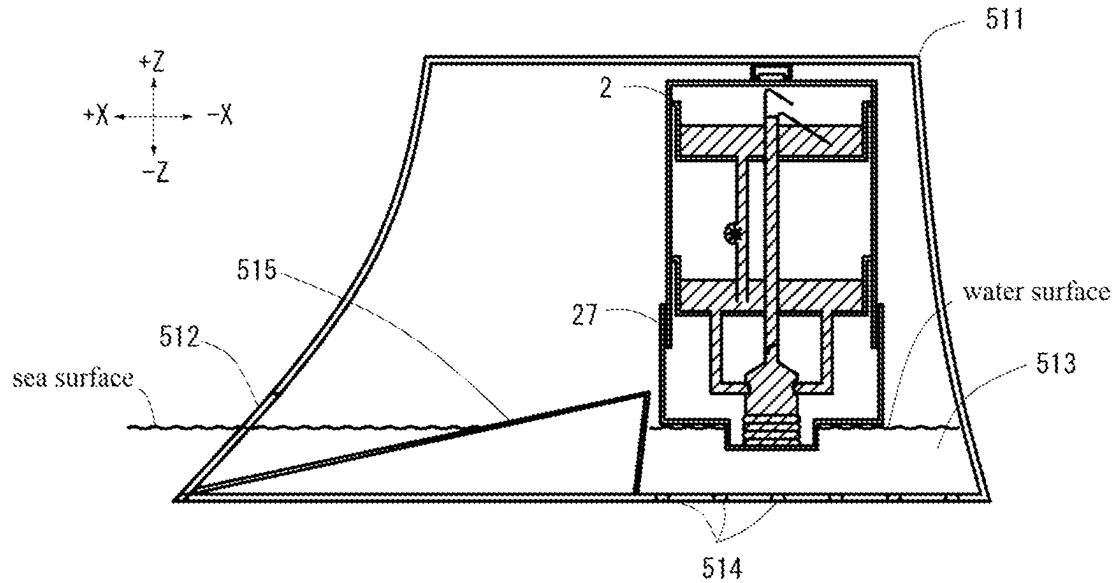
[Fig.22]



[Fig.23]

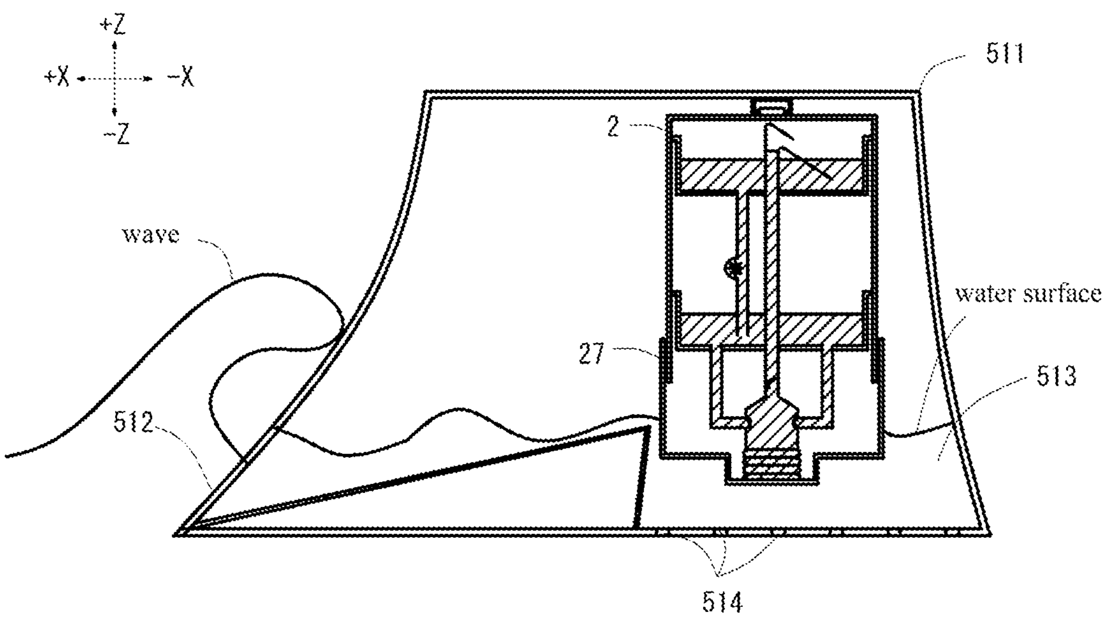


[Fig.24]



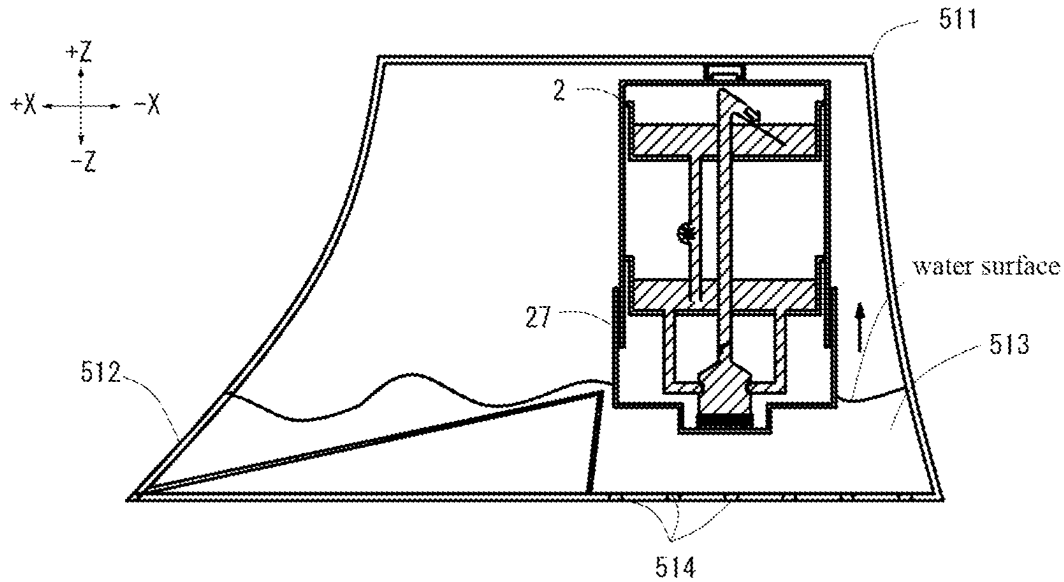
511
+Z
+X
-X
-Z
2
515
27
water surface
512
513
sea surface
514


[Fig.25]

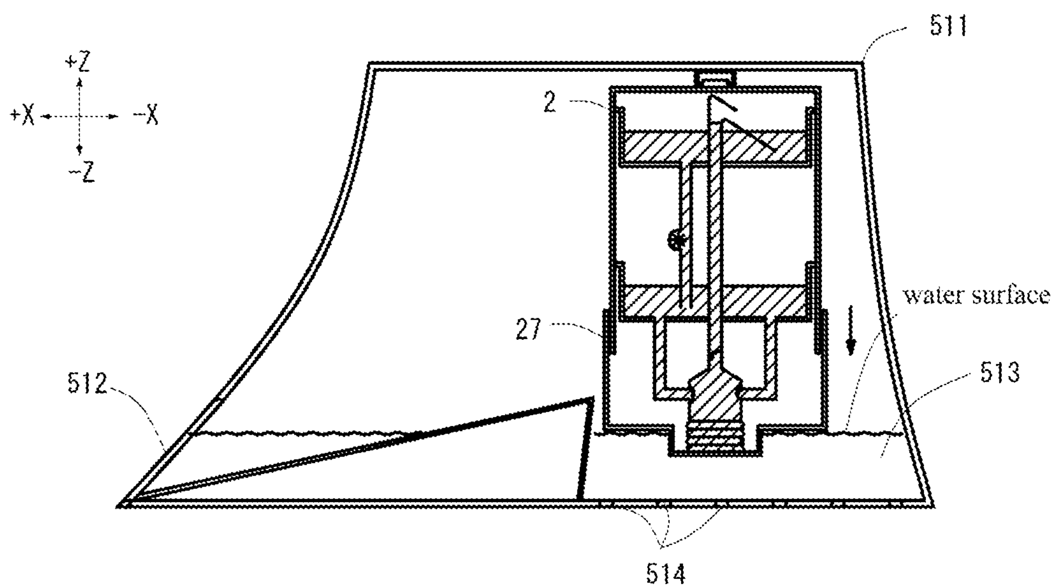


511
+Z
+X
-X
-Z
2
wave
water surface
27
513
512
514

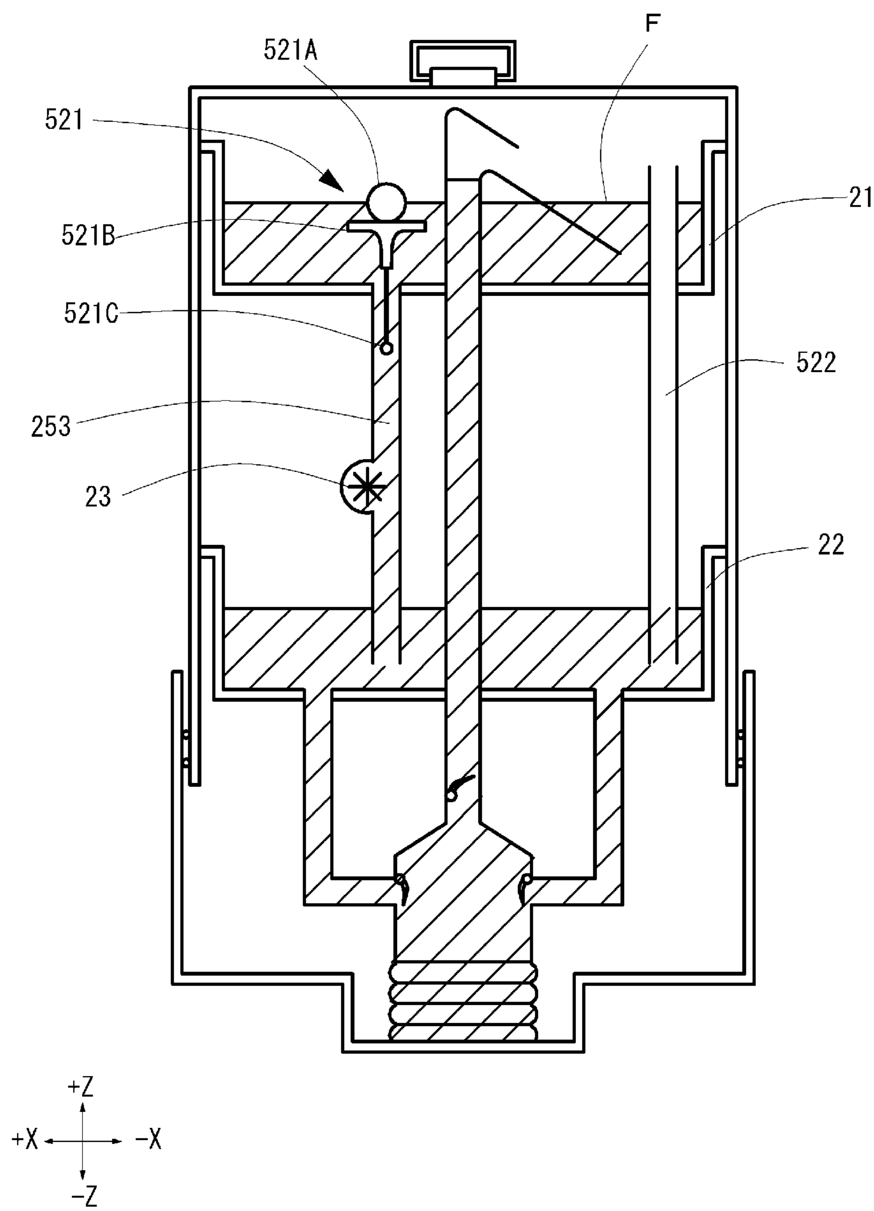
[Fig.26]


511
+Z
+X
-X
-Z
2
water surface
27
513
512
514

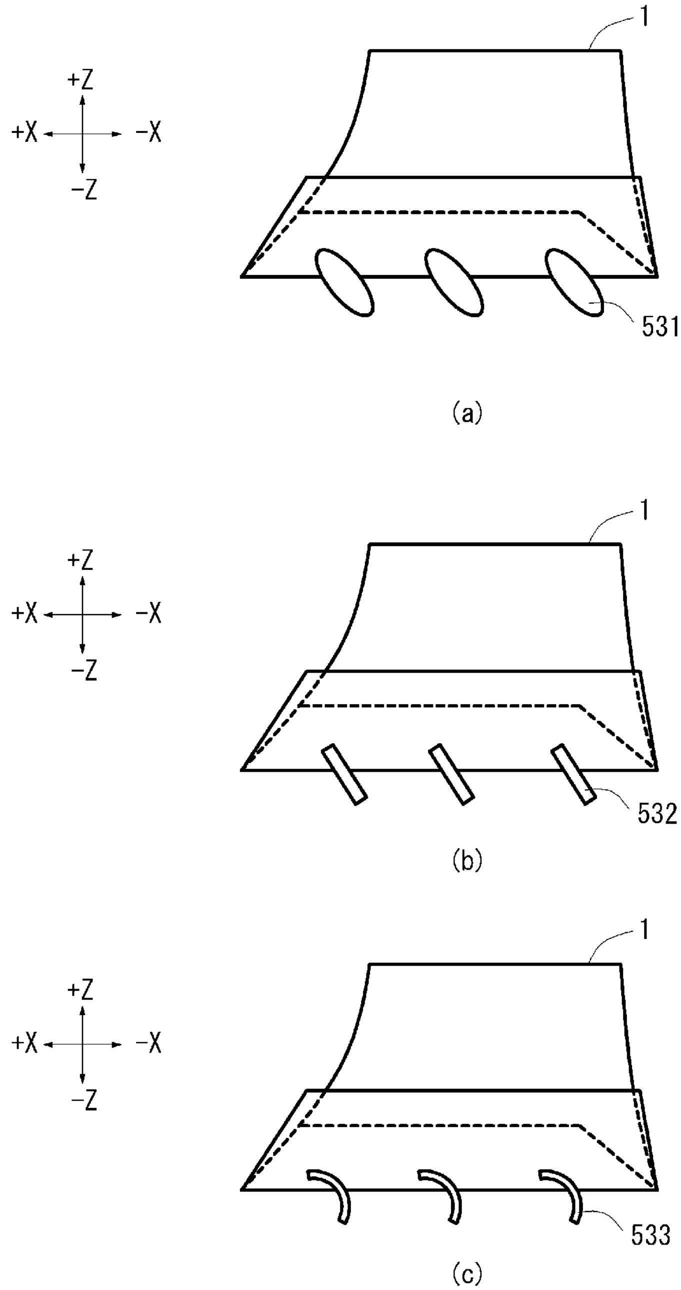
[Fig.27]


511
+Z
+X
-X
-Z
2
water surface
27
513
512
514

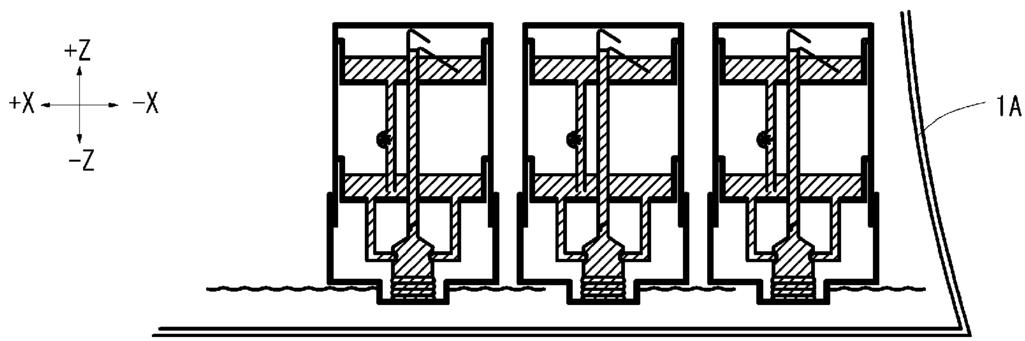
[Fig.28]



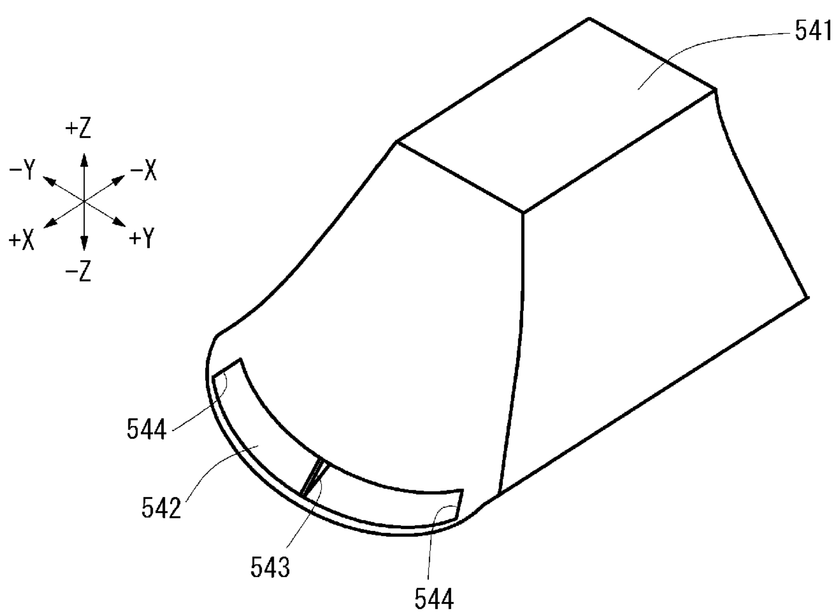
[Fig.29]



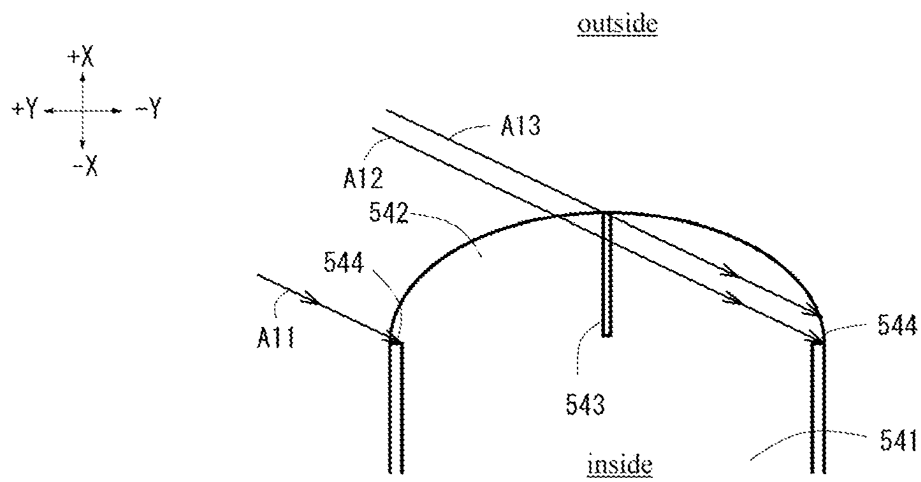
[Fig.30]



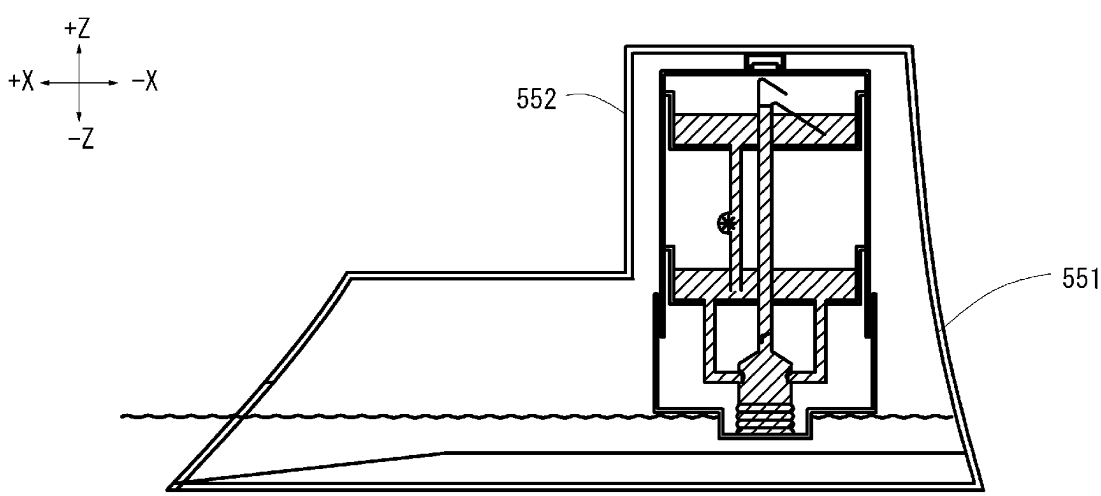

[Fig.31]



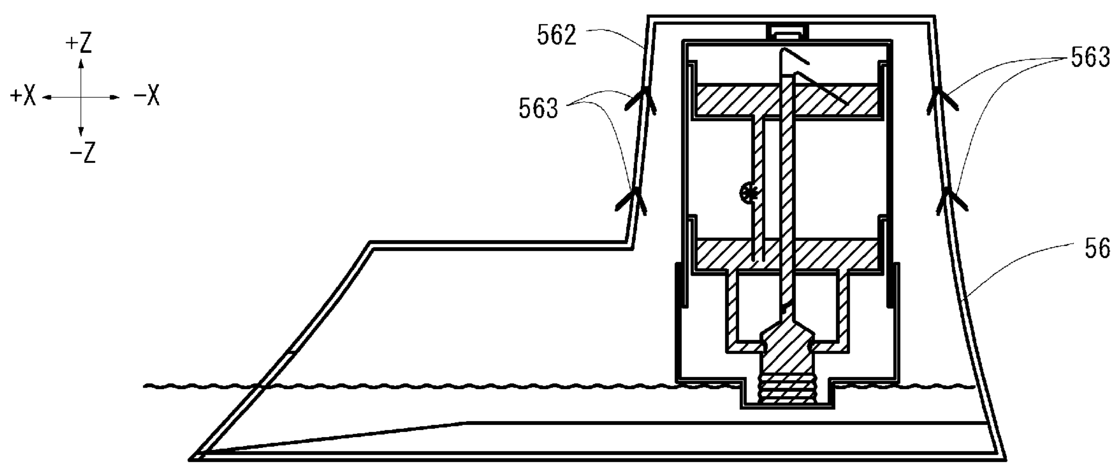
[Fig.32]


outside
+X
+Y
-Y
-X
A13
A12
542
544
A11
544
543
541
inside

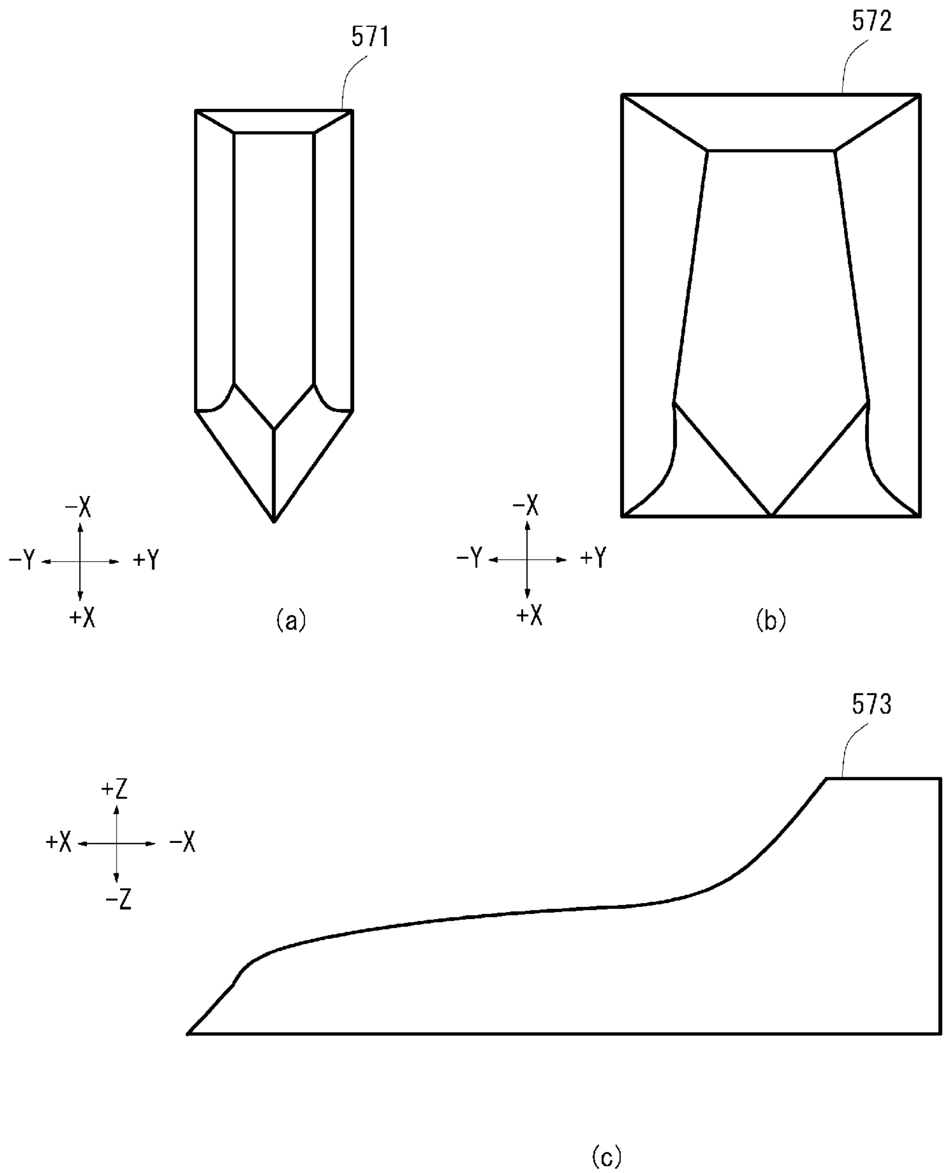
[Fig.33]


+Z
+X
-X
-Z
552
551

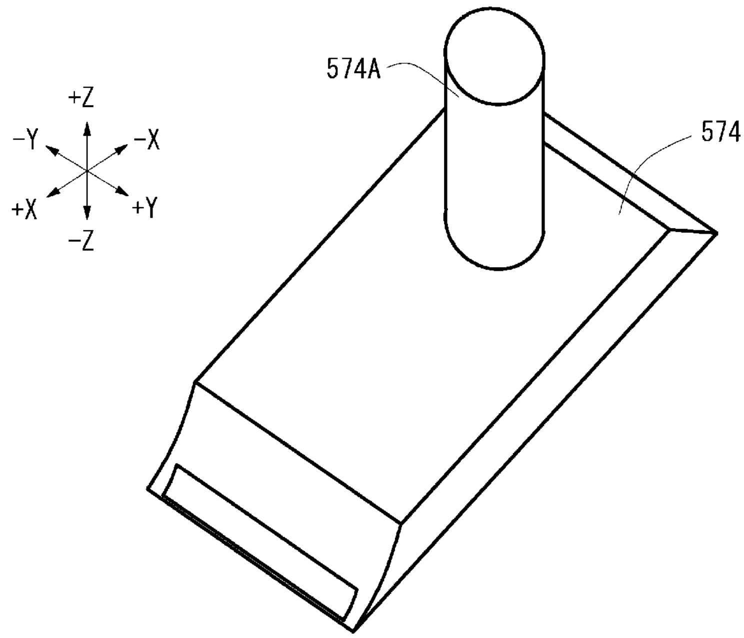
[Fig.34]



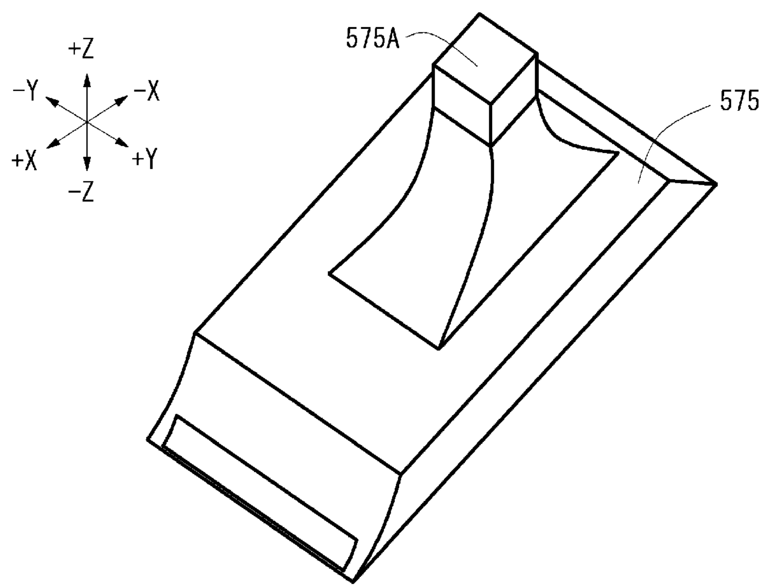
[Fig.35]



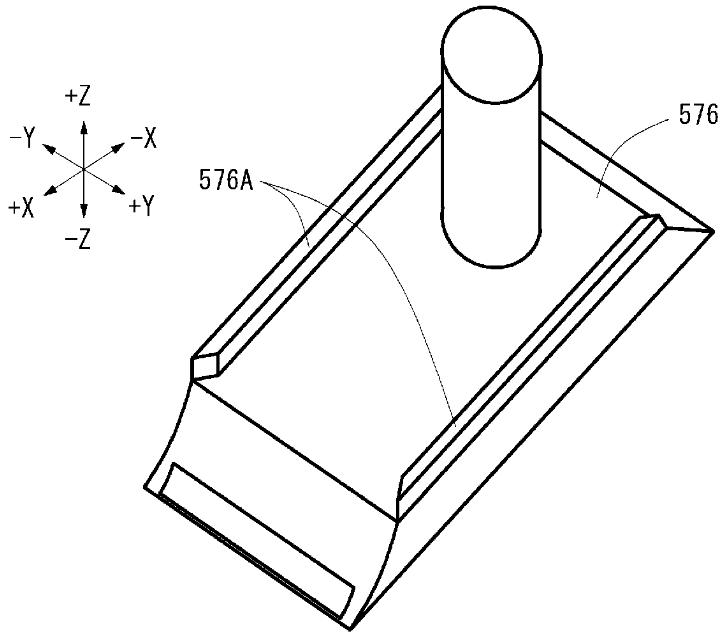
[Fig.36]



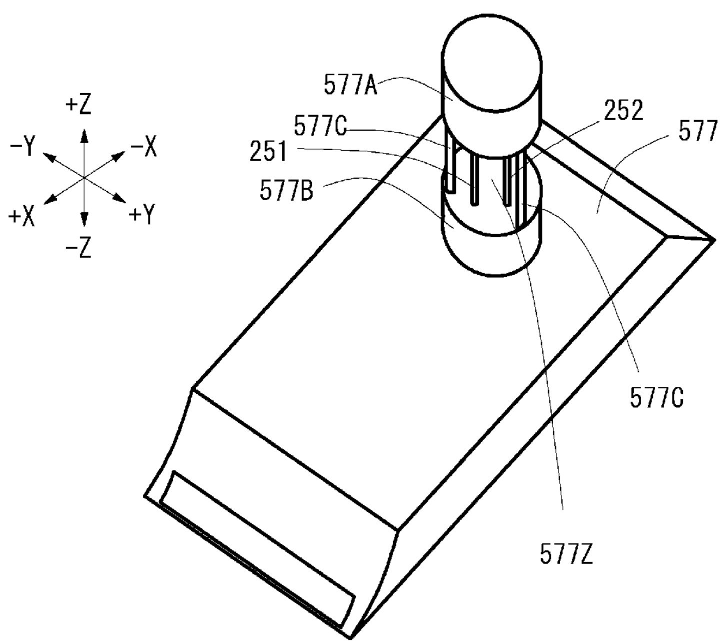

[Fig.37]



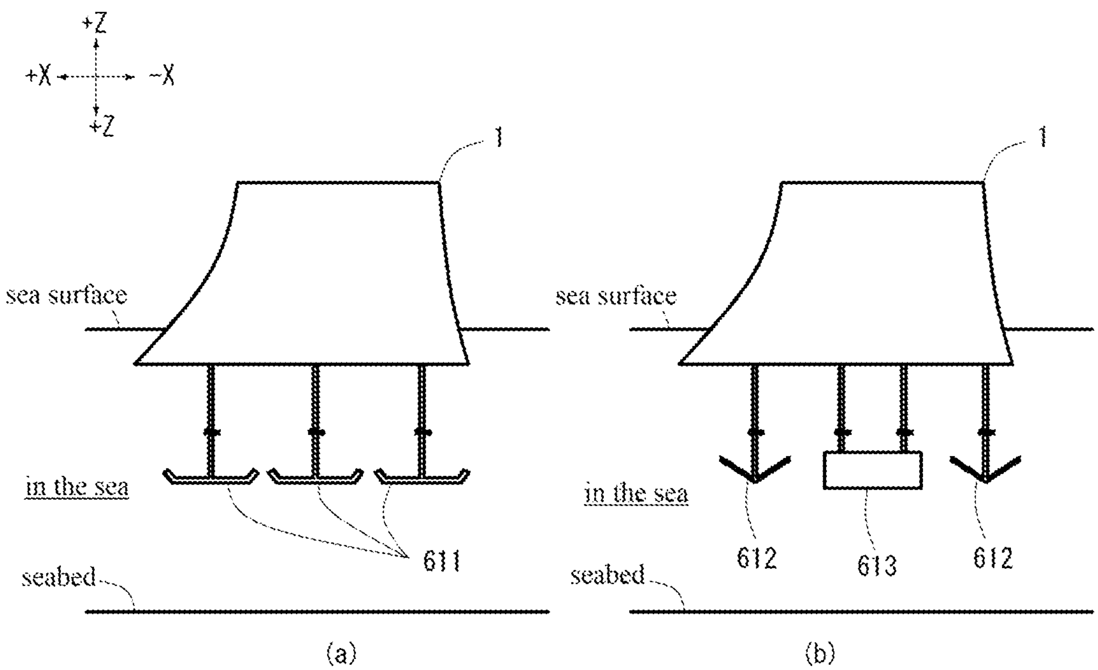
[Fig.38]



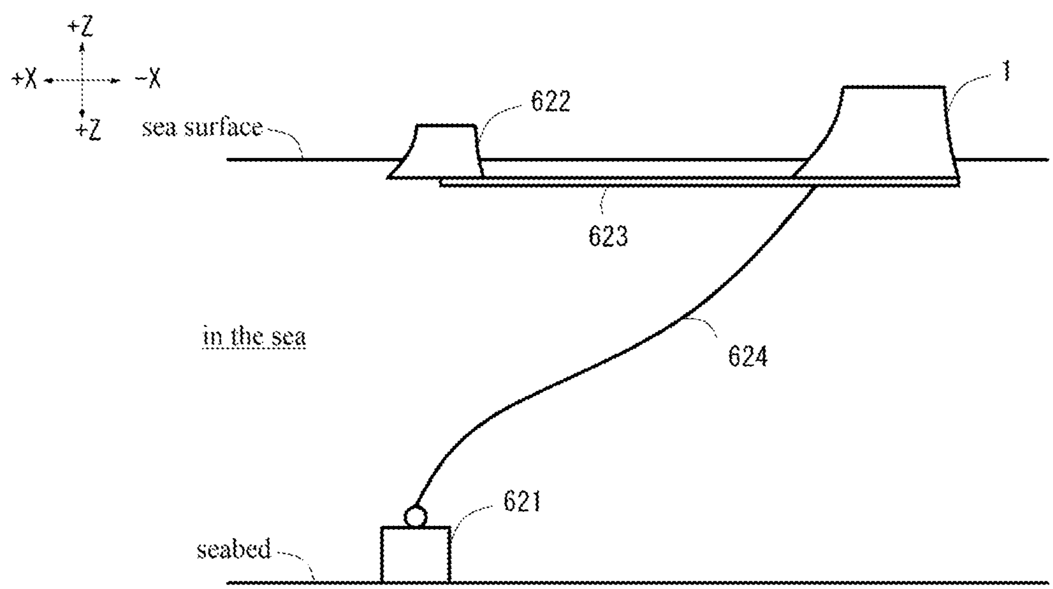

[Fig.39]



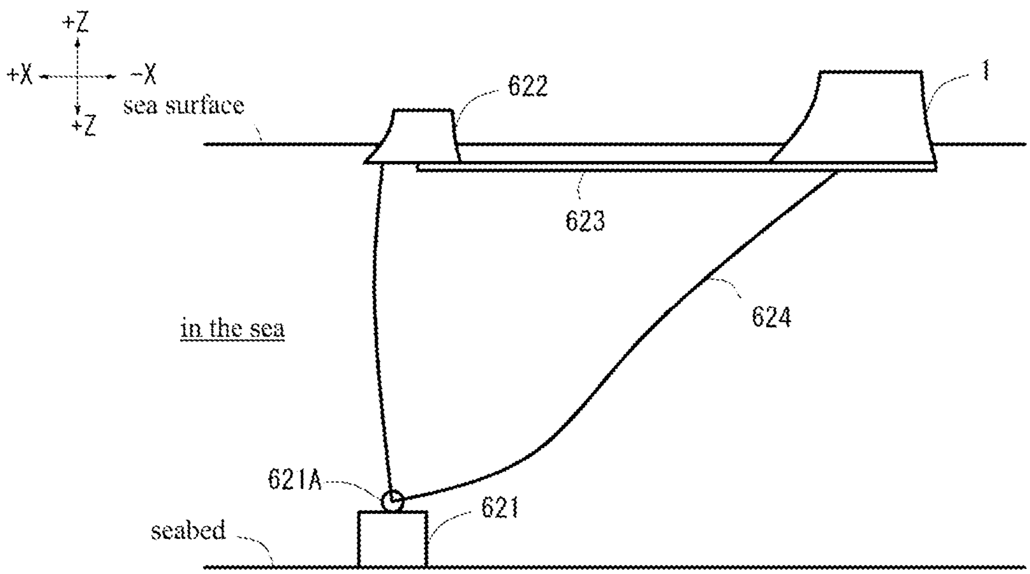
[Fig.40]


+Z
+X
-X
+Z
1
sea surface
in the sea
611
seabed
(a)
1
sea surface
in the sea
612
613
612
seabed
(b)

[Fig.41]

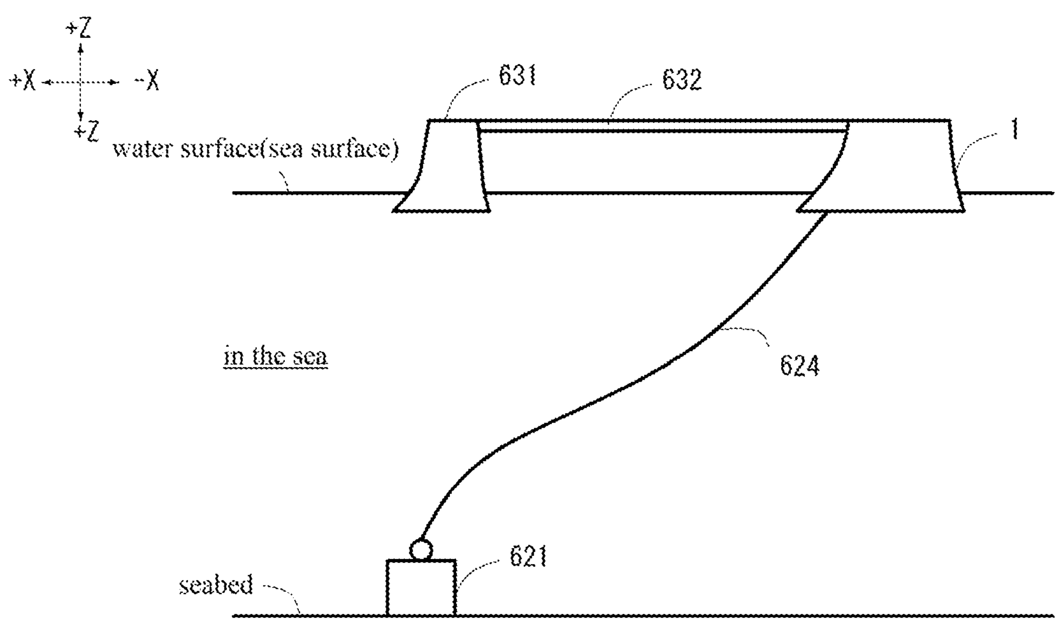

+Z
+X
-X
+Z
622
1
sea surface
623
in the sea
624
621
seabed

[Fig.42]



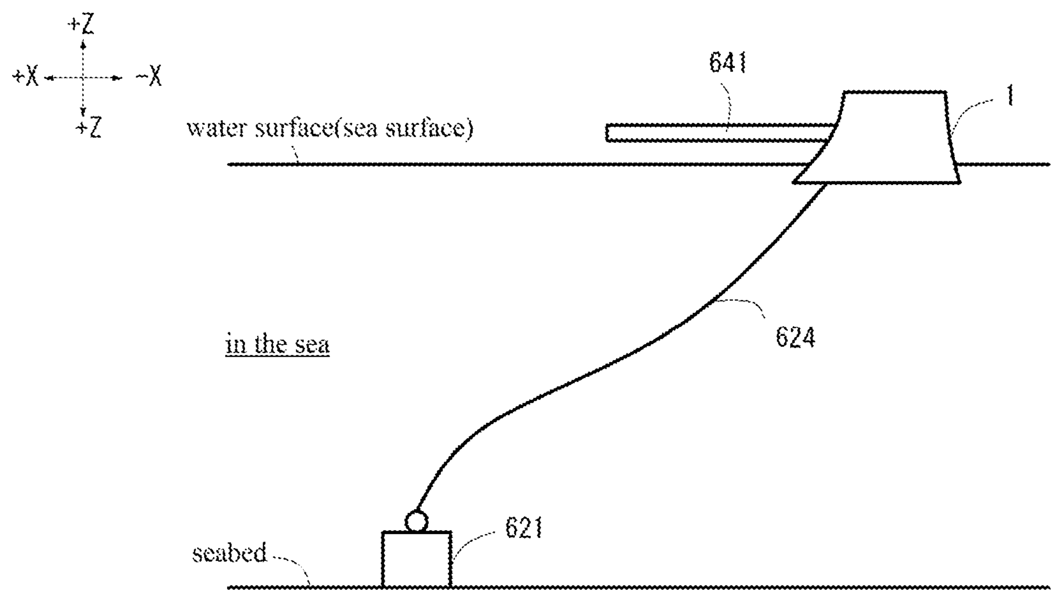
+Z
+X
-X
+Z
sea surface
622
1
623
in the sea
624
621A
621
seabed


[Fig.43]

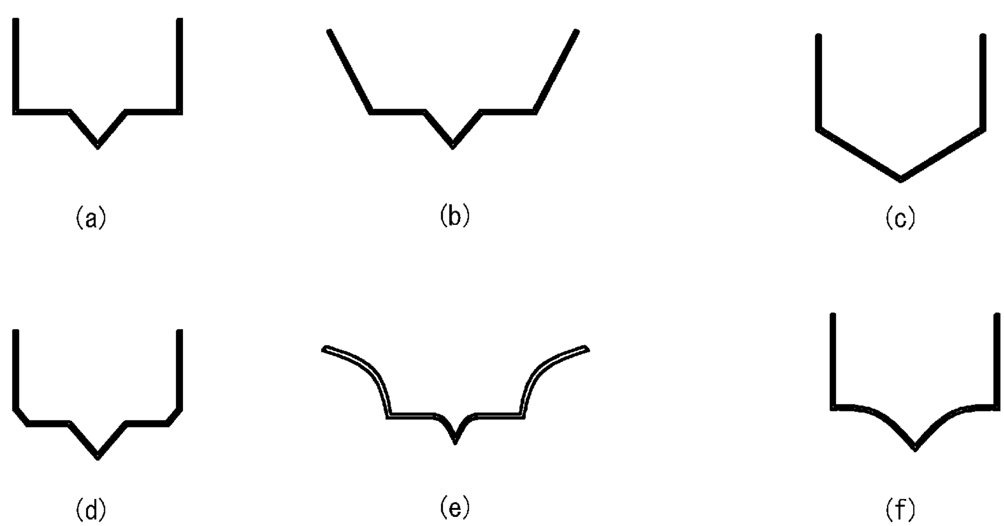


+Z
+X
-X
+Z
631
632
1
water surface(sea surface)
in the sea
624
621
seabed

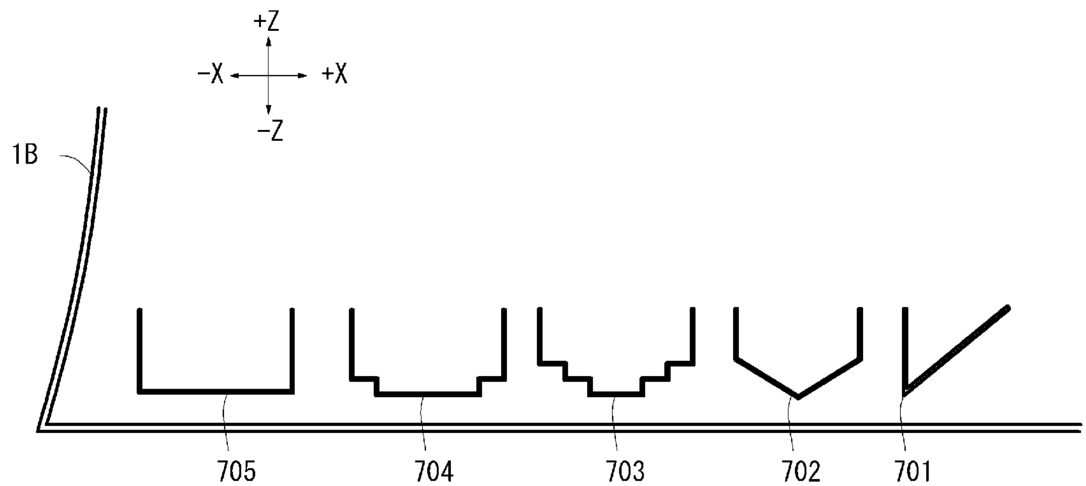
[Fig.44]


+Z
+X
-X
+Z
641
1
water surface(sea surface)
in the sea
624
621
seabed

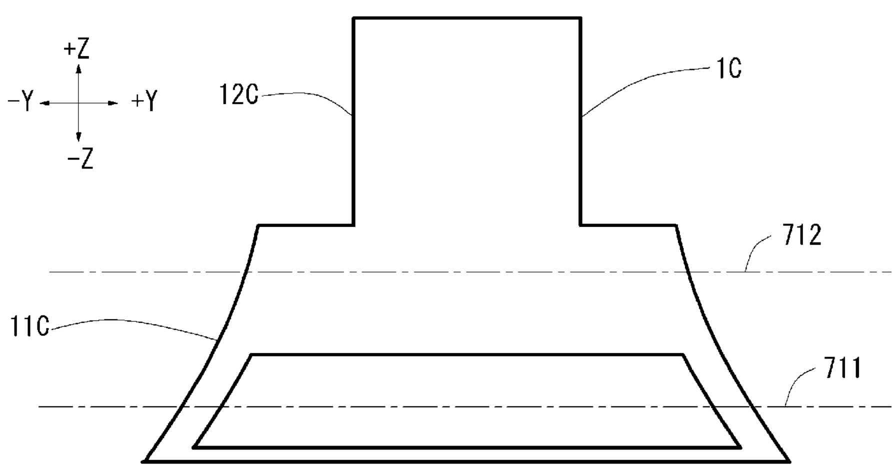
[Fig.45]


(a)
(b)
(c)
(d)
(e)
(f)

[Fig.46]




[Fig.47]



# POWER GENERATION SYSTEM

## CROSS REFERENCE TO RELATED APPLICATIONS

The present application is a continuation-in-part of PCT application No. PCT/JP2021/038539 filed on Oct. 19, 2021, the disclosure of which is incorporated by reference its entirety.

## INCORPORATION BY REFERENCE

All publications and patent applications mentioned in this specification are herein incorporated by reference in their entirety to the same extent as if each individual publication or patent application was specifically and individually indicated to be incorporated by reference.

## TECHNICAL FIELD

The present invention relates to a power generation system.

## BACKGROUND ART

In the related art, there has been proposed a power generation device that generates electricity using water pumped up to a predetermined height position. Such a power generation device includes a generator motor driven as a generator during an electricity generation operation and driven as an electric motor during a pumping operation, and a pump turbine coupled to a drive shaft of the generator motor. The power generation device drives the electric motor to generate electricity by rotating the pump turbine using water flowing from an upper reservoir to a lower reservoir in the daytime where the amount of electric power consumption is large, and pumps water in the lower reservoir to the upper reservoir by receiving electric power supplied from the outside at night where the amount of electric power consumption is small, to drive the generator motor to rotate the water turbine.

## CITATION LIST

### Patent Literature

Patent Document 1: Japanese Unexamined Patent Application Publication No. 2003-166461

## SUMMARY OF INVENTION

### Technical Problem

However, in the power generation device of the related art, as described above, since the pumping operation is performed by receiving electric power supplied from the outside, there is a possibility that the expense required for the electric power increases, and there has been a desire for a reduction in the cost for generating electricity.

The invention has been made in view of the above-described circumstances, and an object of the invention is to provide a power generation system capable of generating electricity at low cost.

### Solution to Problem

One aspect of the present invention provides a power generation system for generating electricity using a potential



energy of a fluid raised to a predetermined height position by a wave force, the system comprising: a system-side accommodation member that floats, the system-side accommodation member including an intake opening portion for taking a wave into an inside of the system-side accommodation member on a front side of the system-side accommodation member; a floating body accommodated in the system-side accommodation member; a feeding device that feeds the fluid toward the predetermined height position based on a wave force received by the floating body due to the wave taken into the inside of the system-side accommodation member through the intake opening portion; and a power generation unit that generates the electricity using the potential energy of the fluid raised to the predetermined height position.

## BRIEF DESCRIPTION OF DRAWINGS

FIG. **1** is a perspective view of a power generation device.

FIG. **2** is a side view of the power generation device.

FIG. **3** is a front view of the power generation device.

FIG. **4** is a front view of the power generation device.

FIG. **5** is a front view of the power generation device.

FIG. **6** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **7** is an enlarged view of a part of FIG. **6**.

FIG. **8** is a plan view illustrating the inside of the power generation device.

FIG. **9** is a view illustrating a circulation of a circulation fluid.

FIG. **10** is a view illustrating a circulation of the circulation fluid.

FIG. **11** is a view illustrating a circulation of the circulation fluid.

FIG. **12** is a view illustrating a circulation of the circulation fluid.

FIG. **13** is a view illustrating a circulation of the circulation fluid.

FIG. **14** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **15** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **16** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **17** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **18** is a view illustrating various shapes of floats.

FIG. **19** is a view illustrating a feeding device.

FIG. **20** is a cross-sectional view illustrating the inside of another power generation device.

FIG. **21** is a view illustrating an auxiliary feeding device.

FIG. **22** is a view illustrating a circulation of the circulation fluid.

FIG. **23** is a view illustrating a circulation of the circulation fluid.

FIG. **24** is a cross-sectional view illustrating the inside of a power generation device.

FIG. **25** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **26** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **27** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **28** is a cross-sectional view illustrating the inside of a power generation device.

FIG. **29** is a side view of a power generation device.

FIG. **30** is a cross-sectional view illustrating a part of the inside of a power generation device.

FIG. **31** is a perspective view of a housing.

FIG. **32** is a plan view illustrating the inside of the housing.

FIG. **33** is a cross-sectional view illustrating the inside of a power generation device.

FIG. **34** is a cross-sectional view illustrating the inside of the power generation device.

FIG. **35** is a view illustrating housings.

FIG. **36** is a perspective view of a housing.

FIG. **37** is a perspective view of a housing.

FIG. **38** is a perspective view of a housing.

FIG. **39** is a perspective view of a housing.

FIG. **40** is a side view of the housing in a floated state.

FIG. **41** is a side view of the housing and the like in a floated state.

FIG. **42** is a side view of the housing and the like in a floated state.

FIG. **43** is a side view of the housing and the like in a floated state.

FIG. **44** is a side view of the housing and the like in a floated state.

FIG. **45** is a view illustrating various shapes of floats.

FIG. **46** is a cross-sectional view illustrating a part of the inside of a power generation device.

FIG. **47** is a front view of a housing.

## DESCRIPTION OF EMBODIMENTS

An embodiment of a power generation system according to the invention will be described below in detail with reference to the accompanying drawings.

### [I] Basic Concept of Embodiment

First, a basic concept of an embodiment will be described. The embodiment relates to a power generation system. The power generation system according to the invention is a system for generating electricity using the potential energy of a fluid raised to a predetermined height position by a wave force, and is, for example, a circulation-type pumped storage power generation system for generating electricity by circulating the fluid.

The "fluid" has fluidity. The "fluid" is a concept including, for example, liquids such as water and oil and semi-solids or solids such as a polymer gel; however, in the embodiment, the fluid will be described as a fluid formed of mixed water containing a chain polymer. In more detail, in the embodiment, a case where the "fluid" is a string-shaped micelle aqueous solution will be described.

### [II] Specific Contents of Embodiment

Next, specific contents of the embodiment will be described.

(Configuration)

First, a configuration of a power generation device according to an embodiment will be described. FIG. **1** is a perspective view of the power generation device, FIG. **2** is a side view of the power generation device, FIGS. **3** to **5** are front views of the power generation device, FIG. **6** is a cross-sectional view illustrating the inside of the power generation device, FIG. **7** is an enlarged view of a part of FIG. **6**, and FIG. **8** is a plan view illustrating the inside of the power generation device.

It should be noted that a description will be given based on the assumption that in each drawing, X, Y, and Z axes are orthogonal to each other, the Z axis indicates a vertical direction, a +Z direction is referred to as an upper side or upward (plane surface), and a −Z direction is referred to as a lower side or downward (bottom surface). In addition, a description will be given based on the assumption that the X axis indicates a horizontal direction (front-rear direction), and a +X direction is referred to as the front or front side, and a −X direction is referred to as the back or back side. In addition, a description will be given based on the assumption that the Y axis indicates a horizontal direction (left-right direction or side direction), a +Y direction is referred to as the right side surface, and a −Y direction is referred to as the left side surface.

In addition, in FIGS. **4** and **6**, a power generation device **100** floated in the sea is illustrated, and a sea surface or a water surface is illustrated. It should be noted that in each drawing, the sea surface or the water surface is not illustrated as appropriate. It should be noted that the surface of seawater that has entered the inside of a housing **1** is referred to as the water surface. In addition, in FIG. **5**, an internal structure of the power generation device **100** which can be seen through a front side opening portion **16** is also partially illustrated, and the internal structure is not illustrated in other drawings as appropriate. FIGS. **6** and **7** are illustrated for convenience of description. In addition, in each cross-sectional view, a circulation fluid F is illustrated by hatching. In addition, in FIG. **8**, the outer shape of the housing **1** is illustrated by a one-dot chain line, a storage tank-side accommodation portion **2** and the like in FIG. **7** are not illustrated, and the outer shape of a float **27** and the like are illustrated. In addition, in each drawing, in order to describe each configuration of the power generation device **100**, some elements other than objects to be described are not illustrated as appropriate.

The power generation device **100** in FIG. **1** is a power generation system that generates electricity using the potential energy of the circulation fluid F (FIG. **7**) raised to a predetermined height position by a wave force. It should be noted that the shape of the power generation device **100** is, unless otherwise specified, left-right symmetrical with respect to an X-Z plane passing through the center of the power generation device **100**, with the left and right sides having the same shape and size, and in the following description, only one side is denoted by a reference sign as appropriate, and will be described.

The power generation device **100** in FIG. **1** is a device that is used in the sea in a floating manner and that generates electricity, and for example, is used in a floating manner while maintaining a state where waves come toward the front side of the power generation device **100** with the front side (side on which the front side opening portion **16** is provided) of the power generation device **100** facing an offshore direction (namely, a direction in which waves surge).

The power generation device **100** includes, for example, the housing **1** in FIG. **1**, the storage tank-side accommodation portion **2** in FIG. **7**, an upper storage tank **21**, a lower storage tank **22**, a power generation unit **23**, a feeding device **24**, a first pipe **251**, a second pipe **252**, a third pipe **253**, a first pipe-side check valve **261**, a second pipe-side check valve **262**, and the float **27**.

It should be noted that the circulation fluid F is the above-described fluid, specifically, a fluid that is circulated in the power generation device **100** to be used for the generation of electricity in the power generation unit **23**, and is, for example, a liquid formed of mixed water containing a chain polymer (in detail, a string-shaped micelle aqueous solution).

(Configuration—Housing)

The housing **1** in FIGS. **1** to **6** is a system-side accommodation member that accommodates elements of the power generation device **100**. Specifically, the housing **1** is floated in the sea (namely, floats in the sea), and has, for example, a box shape including a hollow portion **10** in FIG. **6**. The material of the housing **1** is optional, and may be a metal, a resin, a combination thereof, or any other material. In addition, since the housing **1** is floated in the sea, elements for increasing buoyancy, such as known floats, may be provided at any positions or the housing **1** may be made of a material that increases buoyancy.

The housing **1** includes, for example, a housing-side front portion **11**, housing-side side portions **12**, a housing-side back portion **13**, outer flow paths **14**, a front side inclined portion **15**, and the front side opening portion **16** that are illustrated in FIG. **1**, and an internal front side inclined portion **17**, internal side inclined portions **18**, and an internal bottom portion **19** that are illustrated in FIGS. **5** and **8**.

(Configuration—Housing—Housing-Side Front Portion)

The housing-side front portion **11** in FIG. **1** is a suppressing member, and is a first outer inclined portion. For example, the housing-side front portion **11** is a partition wall that forms a front side (+X direction) of the housing **1** and that partitions the inside and the outside of the housing **1**. The “suppressing member” is a member that suppresses swing of the housing **1** caused by a wave of a predetermined wave height or more by causing at least a part of the housing **1** to submerge in water (namely, in the sea) when receiving the wave.

For example, as illustrated in FIG. **2**, the housing-side front portion **11** is curved and inclined toward the back side (−X direction) as the housing-side front portion **11** extends toward the upper side (+Z direction), namely, the housing-side front portion **11** is inclined such that a wave of a predetermined wave height or more (as one example, a wave height that reaches a position higher than an upper end portion of the front side opening portion **16** in FIG. **4**, 2 m to 3 m or more or the like) rises up the housing-side front portion **11** when receiving the wave.

It should be noted that, here, the case where the housing-side front portion **11** is curved and inclined has been described; however, for example, the housing-side front portion **11** may be inclined in a straight state without being curved (the same applies to the housing-side side portions **12**). In addition, “a wave rising up” may be interpreted as, for example, a concept including seawater rising up due to a force of the wave.

(Configuration—Housing—Housing-Side Side Portion)

The housing-side side portions **12** in FIG. **1** are the suppressing member, and are first outer inclined portions. For example, the housing-side side portions **12** are partition walls that form both side surface sides (+Y direction and −Y direction) of the housing **1** and that partition the inside and the outside of the housing **1**. For example, as illustrated in FIG. **4**, the housing-side side portions **12** on both sides are curved and inclined to approach each other as the housing-side side portions **12** extend toward the upper side (+Z direction), namely, the housing-side side portions **12** are inclined such that a wave of a predetermined wave height or more (as one example, a wave height that reaches a position higher than upper end portions of flow path side wall portions **141** in FIG. **4**, 2 m to 3 m or more or the like) rises up the housing-side side portions **12** when receiving the wave.

(Configuration—Housing—Housing-Side Back Portion)

The housing-side back portion **13** in FIG. **1** is, for example, a partition wall that forms the back side (−X direction) of the housing **1** and that partitions the inside and the outside of the housing **1**. The shape of the housing-side back portion **13** is optional, and for example, may be a shape inclined similarly to the housing-side front portion **11**, or may be other shapes. In the present embodiment, the housing-side back portion **13** configured to have a slightly inclined shape is illustrated.

(Configuration—Housing—Outer Flow Path)

The outer flow paths **14** in FIG. **1** are the suppressing member. For example, as illustrated in FIG. **4**, the outer flow paths **14** are provided on both side surfaces of the housing **1**, as illustrated in FIG. **2**, extend between the front side (+X direction) and the back side (−X direction) of the housing **1**, and are configured such that a wave of a predetermined wave height or more (as one example, a wave height higher than the height of flow path bottom portions **142** or the upper end portions (+Z direction) of the flow path side wall portions **141**, 2 m to 3 m or more or the like) rises up the outer flow paths **14** when receiving the wave. For example, as illustrated in FIGS. **2** to **4**, each of the outer flow paths **14** is a flow path surrounded by the flow path side wall portion **141** having a predetermined height, the flow path bottom portion **142**, and a part of the housing-side side portion **12**.

(Configuration—Housing—Front Side Inclined Portion)

The front side inclined portion **15** in FIG. **1** is the suppressing member and is a second outer inclined portion, and for example, as illustrated in FIGS. **1** to **4**, is provided on the front side (+X direction) of the housing **1**. The front side inclined portion **15** is continuous with the outer flow paths **14**, and is configured to guide a wave of a predetermined wave height or more to the outer flow paths **14** when receiving the wave. It should be noted that the front side inclined portion **15** may be continuously formed on the same surface as a front side (+X direction) surface of the housing-side front portion **11**, or may be formed as a surface other than the front side surface by providing a step with respect to the front side surface. It should be noted that “guiding a wave” may be interpreted as, for example, a concept including guiding seawater supplied by the wave and guiding the wave itself.

(Configuration—Housing—Front Side Opening Portion)

The front side opening portion **16** in FIG. **1** is an intake opening portion for taking a wave into the inside of the housing **1**. The front side opening portion **16** is, for example, an opening provided in the housing-side front portion **11**, and is an opening communicating with the hollow portion **10** (FIG. **6**). For example, as illustrated in FIG. **4**, the front side opening portion **16** has a substantially rectangular shape in a front view. The front side opening portion **16** is formed, for example, such that a distance D**1** (FIG. **4**) from the sea surface to the upper end portion (+Z direction) of the front side opening portion **16** when there are no waves in a state where the housing **1** is floated in the sea is a predetermined distance.

A specific value of the distance D**1** is optional, and for example, an experiment, a simulation, or the like for confirming a relationship between the up-down movement of the float **27** of the power generation device **100** illustrated in FIG. **7** and the wave height of a wave to be taken in may be performed, and the distance D**1** may be set such that a wave of a wave height which appropriately moves the float **27** up and down to generate electricity is taken in, and as one example, may be set to approximately 50 cm to 100 cm. It should be noted that "taking in a wave" may be interpreted as, for example, a concept including taking in seawater supplied by the wave and taking in the wave itself.

(Configuration—Housing—Internal Front Side Inclined Portion)

The internal front side inclined portion **17** in FIGS. **5**, **6**, and **8** is a first inner inclined portion extending from the front side opening portion **16** toward the float **27** inside the housing **1**, and is a first inner inclined portion inclined to be located upward (+Z direction) as the first inner inclined portion extends away from the front side opening portion **16**.

Since the internal front side inclined portion **17** is provided, in the hollow portion **10**, the water depth becomes gradually shallower from the front side opening portion **16** toward the float **27** (FIG. **6**). As a result, the wave height of a wave taken into the hollow portion **10** of the housing **1** from the outside through the front side opening portion **16** gradually increases as the wave moves toward the float **27**, and a wave of a wave height that appropriately moves the float **27** up and down is supplied to the float **27**.

(Configuration—Housing—Internal Side Inclined Portion)

The internal side inclined portions **18** in FIGS. **5** and **8** are second inner inclined portions that are provided on both sides of the internal front side inclined portion **17** inside the housing **1**, and are second inner inclined portions inclined more steeply than the internal front side inclined portion **17**. For example, the internal side inclined portions **18** are inclined more gently than inner wall portions **18**A. It should be noted that the inner wall portions **18**A are vertically erected walls provided on opposite sides of the respective internal side inclined portions **18** from the internal front side inclined portion **17** with respect to the left-right direction (Y direction).

By providing the internal side inclined portions **18**, waves taken into the hollow portion **10** of the housing **1** from the outside through the front side opening portion **16** can be prevented from directly hitting the inner wall portions **18**A and being reflected, and the waves can be supplied to the back of the housing **1** (namely, a float **27** side).

(Configuration—Housing—Internal Bottom Portion)

The internal bottom portion **19** in FIGS. **5**, **6**, and **8** is a bottom of the hollow portion **10** of the housing **1**, and is, for example, flat.

(Configuration—Storage Tank-Side Accommodation Portion)

The storage tank-side accommodation portion **2** in FIGS. **6** and **7** is a storage member-side accommodation member that accommodates the upper storage tank **21**, the lower storage tank **22**, and the like, and for example, as illustrated in FIG. **6**, is provided in a state where the storage tank-side accommodation portion **2** is suspended from an upper portion (+Z side) of the housing **1** inside the housing **1** so as to be swingable with respect to the housing **1** via a suspension portion **20**. Since the storage tank-side accommodation portion **2** is suspended from the housing **1**, even when the housing **1** swings upon receiving a wave, the storage tank-side accommodation portion **2** swings independently of the housing **1**, so that the magnitude of the swing of the housing **1** can be prevented from being directly transmitted to the storage tank-side accommodation portion **2**, and the magnitude of the swing of the storage tank-side accommodation portion **2** (in detail, the swing of the upper storage tank **21**, the lower storage tank **22**, and the like that are accommodated therein) can be reduced.

It should be noted that a method for attaching the storage tank-side accommodation portion **2** is not limited to the suspension method, and for example, the storage tank-side accommodation portion **2** may be fixedly provided with respect to the upper portion of the housing **1** using any method (welding, a method that uses a metal fitting for fixing, or the like).

The storage tank-side accommodation portion **2** has, for example, a roughly box shape including a hollow portion, has a shape covering objects to be accommodated (the upper storage tank **21**, the lower storage tank **22**, and the like) from the upper side (+Z direction) and the sides, and has a shape of which the lower side (−Z direction) is open.

(Configuration—Upper Storage Tank)

The upper storage tank **21** in FIG. **7** is a storage member that stores the circulation fluid F. Specifically, the upper storage tank **21** is an upper storage member provided at a predetermined height position, and is an upper storage member that stores the circulation fluid F fed by the feeding device **24**. The position where the upper storage tank **21** is provided is optional as long as the position is higher than the power generation unit **23**, and may be determined, for example, by performing various experiments, simulations, or the like related to the generation of electricity in the power generation unit **23**. The upper storage tank **21** is fixed to, for example, a storage tank-side accommodation portion **2** side.

(Configuration—Lower Storage Tank)

The lower storage tank **22** in FIG. **7** is a storage member that stores the circulation fluid F. Specifically, the lower storage tank **22** is a lower storage member provided below the upper storage tank **21**, and is a lower storage member that stores the circulation fluid F supplied from the upper storage tank **21**. The position where the lower storage tank **22** is provided is optional as long as the position is lower than the power generation unit **23** and the upper storage tank **21**, and may be determined, for example, by performing various experiments, simulations, or the like related to the generation of electricity. The lower storage tank **22** is fixed to, for example, the storage tank-side accommodation portion **2** side.

(Configuration—Power Generation Unit)

The power generation unit **23** in FIG. **7** is a power generation unit that generates electricity using the potential energy of the circulation fluid F raised to the predetermined height position, and specifically, is a power generation unit that generates electricity using the circulation fluid F supplied from the upper storage tank **21** to the lower storage tank **22**. The power generation unit **23** is, for example, a device that generates electricity using the energy of the circulation fluid F flowing (descending) through the third pipe **253** due to its own weight, and can be configured using a known generator. The power generation unit **23** is provided, for example, at a predetermined position in the third pipe **253**.

(Configuration—Feeding Device)

The feeding device **24** in FIG. **7** is a feeding device that feeds the circulation fluid F toward the predetermined height position based on a wave force received by the float **27**, and is a feeding device accommodated in a hollow portion **27**A of the float **27**. The feeding device **24** is, for example, a first feeding device that feeds the circulation fluid F to the predetermined height position when the float **27** moves upward based on the wave force. For example, the feeding device **24** is a device which supplies the circulation fluid F to the upper storage tank **21** by raising the circulation fluid F through the first pipe **251**, and to which the circulation fluid F is supplied through the second pipe **252**. The feeding device **24** includes, for example, a bellows tube **241** and a duct tube **242**.

(Configuration—Feeding Device—Bellows Tube)

The bellows tube **241** in FIG. **7** is a bellows tube in which the circulation fluid F is stored, and is a bellows tube of which the internal volume (namely, the volume of a hollow portion of the bellows tube **241**) increases or decreases according to the up-down movement of the float **27** based on the wave force. The bellows tube **241** includes a hollow portion communicating with a hollow portion of the duct tube **242**, and the circulation fluid F is movable between the hollow portion of the bellows tube **241** and the hollow portion of the duct tube **242** inside the feeding device **24**.

An upper end portion (+Z direction) of the bellows tube **241** is fixedly connected to a lower end (−Z direction) of the duct tube **242**, and a lower end portion (−Z direction) of the bellows tube **241** is fixed to a bottom of the float **27**. When the float **27** moves to the upper side (+Z direction), the bellows tube **241** is pushed by the float **27** to contract, and the volume of the bellows tube **241** decreases. On the other hand, when the float **27** moves to the lower side (−Z direction), the bellows tube **241** is pulled by the float **27** to expand, and the volume of the bellows tube **241** increases.

(Configuration—Feeding Device—Duct Tube)

The duct tube **242** in FIG. **7** is a feeding flow path that communicates with the bellows tube **241**, and is a feeding flow path that feeds the circulation fluid F based on an increase or decrease in the volume of the bellows tube **241**. For example, the first pipe **251** and the second pipe **252** are connected to the duct tube **242**. The duct tube **242** includes, for example, a portion (lower portion in the drawing) having the same flow path diameter in a height direction (Z-axis direction), and a portion that is reduced in flow path diameter as the portion extends toward the upper side (+Z direction). For example, the duct tube **242** is fixedly provided on the storage tank-side accommodation portion **2** side, and may be made of metal or resin.

(Configuration—First Pipe)

The first pipe **251** in FIG. **7** is a first supply flow path that supplies the circulation fluid F fed by the feeding device **24** to the predetermined height position. For example, the first pipe **251** is fixedly provided on the storage tank-side accommodation portion **2** side (the same applies to the second pipe **252** and the third pipe **253**). A lower end portion of the first pipe **251** is connected to the feeding device **24**, and an upper end portion **251**A of the first pipe **251** is provided on an upper storage tank **21** side.

The upper end portion **251**A is configured to reduce frictional resistance between the circulation fluid F supplied to the predetermined height position (namely, the upper storage tank **21**) and the first pipe **251**, and to suppress foaming of the circulation fluid F when the circulation fluid F is supplied to the predetermined height position. The upper end portion **251**A includes, for example, a guide plate **251**B and an open portion **251**C.

The guide plate **251**B is used to suppress foaming of the circulation fluid F, and is a portion that guides the circulation fluid F to a bottom portion side of the upper storage tank **21**. The circulation fluid F gently flows on the guide plate **251**B and is supplied to the upper storage tank **21**, thereby suppressing foaming.

The open portion **251**C is a portion for reducing frictional resistance between the circulation fluid F and the first pipe **251**, and is a portion that is open on the upper side (+Z direction) of the guide plate **251**B. By providing the open portion **251**C, the contact area between the circulation fluid F and the upper end portion **251**A can be reduced, and the frictional resistance is reduced.

(Configuration—Second Pipe)

The second pipe **252** in FIG. **7** is a second supply flow path that returns the circulation fluid F at the predetermined height position to the feeding device **24**, and specifically, is a flow path that returns the circulation fluid F in the upper storage tank **21** to the feeding device **24** via the lower storage tank **22**. A lower end portion of the second pipe **252** is connected to the feeding device **24**, and an upper end portion of the second pipe **252** is connected to a bottom of the lower storage tank **22**.

For example, a total of two second pipes **252** are provided on both sides of the first pipe **251**. The flow path diameter of the second pipes **252** is optional, and for example, from the viewpoint of appropriately circulating the circulation fluid F, it is preferable that a total flow path diameter of the second pipes **252** is larger than a total flow path diameter of the first pipe **251**. In the present embodiment, it is assumed that one first pipe **251** and two second pipes **252** are provided for one feeding device **24** and a total flow path diameter of the two second pipes **252** is configured to be larger than a flow path diameter of the one first pipe **251**.

(Configuration—Third Pipe)

The third pipe **253** in FIG. **7** is a flow path for supplying the circulation fluid F to the power generation unit **23**. A lower end portion of the third pipe **253** is provided on a lower storage tank **22** side, and an upper end portion of the third pipe **253** is connected to a bottom of the upper storage tank **21**.

(Configuration—Check Valve)

The first pipe-side check valve **261** in FIG. **7** allows the circulation fluid F to flow in a direction indicated by an arrow in FIG. **7** (direction from the feeding device **24** toward the upper storage tank **21**), and prevents a backflow. The second pipe-side check valves **262** allow the circulation fluid F to flow in a direction indicated by arrows in FIG. **7** (direction from the lower storage tank **22** toward the feeding device **24**), and prevent a backflow.

(Configuration—Float)

The float **27** in FIGS. **6** and **7** is a floating body that is floated (floats) in seawater, which is taken into the hollow portion **10** through the front side opening portion **16**, inside the housing **1**, and specifically, moves up and down based on the force of a wave (wave force) taken into the hollow portion **10** through the front side opening portion **16**. The float **27** includes the hollow portion **27**A in which the feeding device **24** and the like are accommodated.

The float **27** has, for example, a box shape of which the upper side (+Z direction) is open. For example, as illustrated in FIG. **8**, the float **27** has a rectangular outer shape in a plan view, and includes a first portion **271** and a second portion **272** in FIG. **7**.

The first portion **271** in FIG. **7** is connected to a lower end portion (−Z direction) of the storage tank-side accommodation portion **2** such that the float **27** can move (namely, move up and down) toward the upper side (+Z direction) or the lower side (−Z direction) with respect to the storage tank-side accommodation portion **2**. The connection method is optional, and for example, as illustrated in FIG. **7**, after configuring an upper end portion (+Z direction) of the first portion **271** so as to have a slightly larger diameter than the lower end portion of the storage tank-side accommodation portion **2**, a method for connecting the first portion **271** and the storage tank-side accommodation portion **2** with a member (for example, a spherical sliding member or the like) for reducing the friction force between the end portions facing each other interposed therebetween may be applied. It should be noted that the float **27** may be configured to move up and down with respect to the storage tank-side accommodation portion **2**, and the first portion **271** may not be connected to the storage tank-side accommodation portion **2**.

The second portion **272** in FIG. **7** is a portion protruding from a lower portion (−Z direction) of the first portion **271**. A cross-sectional area of the second portion **272** is smaller than a cross-sectional area of the first portion **271** with respect to the horizontal direction. Since the second portion **272** is provided, a lower portion (−Z direction) of the float **27** protrudes such that the cross-sectional area in the horizontal direction decreases as the float **27** extends downward (−Z direction).

By providing the second portion **272**, the buoyancy of the float **27** can be increased or decreased in a stepwise manner. For example, when the water surface in FIG. **7** rises from a position corresponding to the second portion **272** to a position corresponding to the first portion **271** due to a wave, the volume of the float **27** provided under the water surface significantly increases in a short time, and the buoyancy that the float **27** receives from seawater significantly increases in a short time (namely, increases in a stepwise manner). On the other hand, for example, when the water surface in FIG. **7** descends from the position corresponding to the first portion **271** to the position corresponding to the second portion **272** due to a wave, the volume of the float **27** provided under the water surface significantly decreases in a short time, and the buoyancy that the float **27** receives from seawater significantly decreases in a short time (namely, decreases in a stepwise manner). The float **27** can be appropriately moved up and down using such a significant increase and decrease in buoyancy, and the circulation fluid F can be reliably supplied from the feeding device **24** to the upper storage tank **21**.

(Circulation)

Next, a circulation of the circulation fluid F in the power generation device **100** will be described. FIGS. **9** to **13** are views illustrating a circulation of the circulation fluid F.

First, as illustrated in FIG. **9**, when a wave hits the front side (+X direction) of the housing **1**, the wave is taken into the hollow portion **10** of the housing **1** through the front side opening portion **16**, and the water surface inside the housing **1** rises as illustrated in FIG. **10**. For example, the water surface rises in a comparatively short time to the vicinity of the first portion **271** (FIG. **7**) of the float **27**, the buoyancy received by the float **27** from seawater increases, and the float **27** moves upward (+Z direction) due to the buoyancy.

In this case, the float **27** approaches the storage tank-side accommodation portion **2**, and since the duct tube **242** of the feeding device **24** in FIG. **7** is fixed to the storage tank-side accommodation portion **2**, the distance between the bottom of the float **27** and the duct tube **242** in the height direction (Z-axis direction) is reduced, and the bellows tube **241** is pushed by the float **27** to contract. Then, the volume of the bellows tube **241** decreases, the circulation fluid F in the bellows tube **241** is pushed out to a duct tube **242** side, and as illustrated in FIG. **11**, the circulation fluid F is pushed out and supplied from the feeding device **24** to the upper storage tank **21** through the first pipe **251**.

Then, the circulation fluid F stored in the upper storage tank **21** descends due to the own weight of the circulation fluid F, and is supplied to the lower storage tank **22** through the third pipe **253**.

Thereafter, some of seawater in the hollow portion **10** of the housing **1** in FIG. **11** is drained to the outside of the housing **1** through the front side opening portion **16**, and as illustrated in FIG. **12**, the water surface inside the housing **1** descends. For example, the water surface descends to the vicinity of the second portion **272** (FIG. **7**) of the float **27** in a comparatively short time, the buoyancy that the float **27** receives from seawater decreases, and as illustrated in FIG. **13**, the float **27** moves to the lower side (−Z direction) due to its own weight.

In this case, the float **27** moves away from the storage tank-side accommodation portion **2**, and since the duct tube **242** of the feeding device **24** in FIG. **7** is fixed to the storage tank-side accommodation portion **2** side, the distance between the bottom of the float **27** and the duct tube **242** in the height direction (Z-axis direction) is increased, and since the lower end portion of the bellows tube **241** is fixed to the bottom of the float **27**, the bellows tube **241** is pulled by the float **27** to expand. Then, since the volume of the bellows tube **241** increases and the circulation fluid F in the duct tube **242** is taken into the bellows tube **241**, the circulation fluid F is drawn and supplied from the lower storage tank **22** to the feeding device **24** through the second pipes **252**.

In such a manner, the circulation fluid F can be raised to the upper storage tank **21** by the up-down movement of the float **27** based on the wave force, and can be circulated.

(Generation of Electricity)

Next, the generation of electricity in the power generation device **100** will be described. The power generation unit **23** generates electricity using the circulation fluid F supplied to flow from the upper storage tank **21** in FIG. **7** to the lower storage tank **22** through the third pipe **253**. In particular, since the circulation fluid F is stored in the upper storage tank **21** by the wave force even while the power generation unit **23** generates electricity, for example, a state where the circulation fluid F is stored in the upper storage tank **21** can be maintained, and the power generation unit **23** can constantly generate power, so that the amount of electricity generated can be improved. In addition, by raising the circulation fluid F to the upper storage tank **21** using the wave force, the need for electric power for operating a device that raises the circulation fluid F is eliminated, and the cost (expense) of the electric power can be omitted, so that electricity can be generated at low cost. A method for using the generated electric power is optional, and for example, the generated electric power may be used by connecting an electric wire for distribution to the power generation device **100** and distributing the generated electric power via the electric wire.

(High Wave)

Next, a case where the power generation device **100** receives a high wave due to the influence of typhoon or the like will be described.

For example, in the power generation device **100** illustrated in FIG. **1**, when a high wave (for example, a wave of a predetermined wave height or more, as one example, a wave of a wave height of 2 m to 3 m or more or the like) surges from the front side (+X direction), the high wave rises up the housing-side front portion **11**, or the wave rises on the outer flow paths **14** via the front side inclined portion **15**. In this case, a part or the entirety of the housing **1** of the power generation device **100** is temporarily submerged in the sea (namely, sunk in the sea) by the rising wave (in detail, the force of the wave, the weight of seawater due to the wave, or the like). As a result, since a part or the entirety of the housing **1** can avoid (or reduce) the wave force received from the high wave in the sea, the wave force that the housing **1** receives from the high wave decreases, and the swing of the housing **1** is suppressed. It should be noted that, here, the power generation device **100** floats up after sinking for a certain time.

It should be noted that in this case, as illustrated in FIG. **1**, since the width of the front side opening portion **16** in the height direction (Z-axis direction) is determined to be a predetermined width, a wave of a wave height suitable for circulating the circulation fluid F is taken into the hollow portion **10** of the housing **1**, so that the circulation of the circulation fluid F is appropriately continued.

In addition, for example, in the power generation device **100** illustrated in FIG. **1**, when a high wave surges from the side surface sides (+Y direction and −Y direction), the high wave rises up the housing-side side portions **12**, or the wave passes over the flow path side wall portions **141** and rises on the outer flow paths **14**. In this case, similarly to the above-described case, the swing of the housing **1** is suppressed.

(Strong Wind)

Next, a case where the power generation device **100** receives strong wind due to the influence of typhoon or the like will be described.

For example, the housing **1** of the power generation device **100** in FIG. **6** may swing due to the influence of strong wind, and in this case, since the storage tank-side accommodation portion **2** is suspended via the suspension portion **20**, the degree of swing of the storage tank-side accommodation portion **2** is reduced, and the degree of swing of the upper storage tank **21**, the lower storage tank **22**, and the like accommodated in the storage tank-side accommodation portion **2** is reduced.

(Advantageous Effects of the Present Embodiment)

According to the present embodiment, for example, electricity can be generated at low cost by feeding the circulation fluid F toward the upper storage tank **21** at the predetermined height position based on the wave force received by the float **27** and by generating electricity using the potential energy of the circulation fluid F raised to the upper storage tank **21** at the predetermined height position.

In addition, since the lower portion of the float **27** protrudes such that the cross-sectional area in the horizontal direction decreases as the float **27** extends downward, for example, when the position of the water surface with respect to the float **27** changes upon receiving a wave, the buoyancy can be increased or decreased in a stepwise manner, and the circulation fluid F can be reliably raised to the predetermined height position, so that electricity can be appropriately generated.

In addition, since the circulation fluid F can be appropriately raised to the predetermined height position, for example, by configuring the upper end portion **251**A of the first pipe **251** so as to reduce frictional resistance between the circulation fluid F supplied to the predetermined height position and the first pipe **251**, and to suppress foaming of the circulation fluid F when the circulation fluid F is supplied to the predetermined height position, electricity can be appropriately generated.

In addition, for example, electricity can be appropriately generated by generating electricity using the circulation fluid F supplied from the upper storage tank **21** to the lower storage tank **22**.

In addition, since the circulation fluid F can be reliably taken into a feeding device **24** side, for example, by setting the total flow path diameter of the second pipes **252** to be larger than the total flow path diameter of the first pipe **251**, the circulation fluid F can be reliably raised to the predetermined height position, and electricity can be appropriately generated.

In addition, since the circulation fluid F can be reliably raised to the predetermined height position, for example, by feeding the circulation fluid F based on an increase or decrease in the volume of the bellows tube **241**, electricity can be appropriately generated.

In addition, since the circulation fluid F is a fluid formed of mixed water containing a chain polymer, for example, the circulation fluid F can be efficiently raised to the predetermined height position, so that the electricity generation efficiency can be improved.

In addition, for example, by providing the suppressing member (the housing-side front portion **11**, the housing-side side portions **12**, the outer flow paths **14**, and the front side inclined portion **15**), the swing of the housing **1** due to a high wave can be suppressed, thereby appropriately generating electricity.

In addition, when the front side inclined portion **15** receives a high wave, the wave can be guided onto the outer flow paths **14**, for example, by guiding the wave to the outer flow paths **14**, so that at least a part of the housing **1** can be reliably submerged in the water, and the swing of the housing **1** due to the high wave can be suppressed, thereby appropriately generating electricity.

In addition, since the magnitude of swing of the housing **1** due to a high wave can be prevented from being directly transmitted to the storage tank-side accommodation portion **2**, for example, by suspending the storage tank-side accommodation portion **2** from the housing **1** inside the housing **1**, the magnitude of the swing of the storage tank-side accommodation portion **2** can be reduced.

In addition, since the internal front side inclined portion **17** is provided, for example, the water depth inside the housing **1** becomes shallower as the distance from the front side opening portion **16** increases, so that the wave height inside the housing **1** can be increased, and the wave force can be increased, thereby appropriately generating electricity.

In addition, since the amount of reflection of a wave inside the housing **1** can be suppressed, for example, by providing the internal side inclined portions **18**, the usage efficiency of the wave can be improved, and the electricity generation efficiency can be improved.

## [III] Modification to Embodiment

The embodiment according to the invention has been described above; however, the specific configurations, members, paths, unit, and device of the invention can be optionally modified and improved within the scope of each technical concept of the invention stated in the claims.

## Regarding Problems to be Solved and Advantageous Effects of the Invention

First, the problems to be solved by the invention and the effects of the invention are not limited to the contents described above, and may differ depending on the details of the implementation environment or the configurations of the invention, and only some of the above-described problems may be solved or only some of the above-described effects may be achieved. In addition, problems derived from the items stated in the present application other than the explicitly stated problems may be interpreted as problems of the present application.

(Regarding Distribution and Integration)

In addition, the configurations described above are functional concepts, and do not necessarily need to be physically configured as illustrated. Namely, the specific forms of the distribution and integration of the parts are not limited to those illustrated, and all or some of the parts can be functionally or physically distributed or integrated in any units.

(Regarding Drainage Adjustment Member)

FIGS. **14** and **15** are cross-sectional views illustrating the inside of the power generation device. A drainage adjustment member may be provided for the power generation device **100** of the embodiment. The "drainage adjustment member" is a member that adjusts a drainage time related to a wave taken into the system-side accommodation member, and is a member provided inside the system-side accommodation member.

For example, as illustrated in FIG. **14**, a drainage adjustment portion **31** and an installation base **32** may be provided on the internal bottom portion **19**.

The drainage adjustment portion **31** is a drainage adjustment member, and can be configured using, for example, a rectangular elastic rubber plate. The width of the drainage adjustment portion **31** is optional, and may be set to, for example, a width slightly shorter than a distance between the inner wall portions **18**A on both sides in the left-right direction (Y-axis direction) of FIG. **8**, may be set to the same width as the width of the internal front side inclined portion **17**, or may be set to a width narrower than the width of the internal front side inclined portion **17**.

For example, the drainage adjustment portion **31** in FIG. **14** is fixed to the installation base **32** at an end portion on the front side (+X direction) thereof, and as illustrated in FIG. **14**, is biased to be disposed along an upper surface of the installation base **32**. Namely, the drainage adjustment portion **31** is biased such that an end portion (hereinafter, a "non-fixed-side end portion") on an opposite side of the drainage adjustment portion **31** from a side fixed to the installation base **32** faces the back side (−X direction).

The installation base **32** in FIG. **14** is a base on which the drainage adjustment portion **31** is to be installed.

When a wave hits the housing **1** and the amount of seawater in the hollow portion **10** increases, and then the seawater in the hollow portion **10** is drained through the front side opening portion **16**, as illustrated in FIG. **15**, the seawater flows from the back side (−X direction) toward the front side (+X direction), but the flow of the seawater lifts up the drainage adjustment portion **31** such that the "non-fixed-side end portion" faces the upper side (+Z direction). Then, since the drainage of the seawater in the hollow portion **10** (in detail, the seawater located on the back side (−X direction) with respect to the drainage adjustment portion **31**) is delayed by the drainage adjustment portion **31** that is lifted up, the time for the float **27** in FIG. **7** to move to the lower side (−Z direction) can be delayed, and the circulation fluid F can be reliably supplied from the feeding device **24** to the upper storage tank **21** side.

With such a configuration, since seawater can be retained inside the housing **1** for a time sufficient for sufficiently feeding the circulation fluid F toward the predetermined height position, for example, by providing the drainage adjustment portion **31**, the circulation fluid F can be appropriately raised to the predetermined height position, and electricity can be appropriately generated.

(Regarding Buffer Material) FIG. **16** is a cross-sectional view illustrating the inside of the power generation device. A buffer material **33** may be provided for the power generation device **100** of the embodiment. The buffer material **33** is a member that reduces an impact on the float **27**. By providing the buffer material **33** on the lower side (−Z direction) of the float **27**, the float **27** can be prevented from directly hitting the internal bottom portion **19** when the float **27** significantly moves to the lower side (−Z direction).

(Regarding Float) FIG. **17** is a cross-sectional view illustrating the inside of the power generation device, and FIG. **18** is a view illustrating various shapes of floats. A float **2711** in FIG. **18** may be used instead of the float **27** of the power generation device **100** of the embodiment. The float **2711** is, unless otherwise specified, the same as the float **27**. As illustrated in FIG. **17**, a front portion **2711**A of the float **2711** (namely, a part of the front side of the float **2711**) is inclined toward a front side opening portion **16** side. With such a configuration, regarding a wave taken in from the front side opening portion **16**, the amount of reflection at the front portion **2711**A can be suppressed, so that the float **2711** can be appropriately moved up and down.

With such a configuration, the front portion **2711**A that is a part on the front side opening portion **16** side of the float **2711** is inclined toward the front side opening portion **16** side, so that for example, the amount of reflection of a wave by the float **2711** can be suppressed. Therefore, the usage efficiency of the wave can be improved, and the electricity generation efficiency can be improved.

It should be noted that as illustrated in FIG. **17**, the front portion **2711**A of the float **2711** may have a linear shape extending straight or a curved shape in a side view. It should be noted that in the case of a curved shape, in particular, the front portion **2711**A may be configured to face the upper side (+Z direction) as the front portion **2711**A extends from the float **2711** toward the front side opening portion **16** side.

In addition, as the shape of the float **27** of the embodiment, the shapes illustrated in FIG. **18**(*a*) to **18**(*d*) or other shapes may be adopted. It should be noted that each drawing illustrates the outer shape of the float when viewed from the front side (namely, the front side opening portion **16** side).

(Regarding Feeding Device) FIG. **19** is a view illustrating a feeding device. FIG. **19**(*a*) is a side view of a feeding device **24**A, in which each check valve inside a duct tube **242**A is illustrated for convenience, and FIG. **19**(*b*) is a rear view. In the power generation device **100** of the embodiment, the feeding device **24**A may be used instead of the feeding device **24**. In the feeding device **24**A, a plurality of bellows tubes **241**A are provided for one duct tube **242**A.

(Another Power Generation Device) FIG. **20** is a cross-sectional view illustrating the inside of another power generation device, FIG. **21** is a view illustrating an auxiliary feeding device, and FIGS. **22** and **23** are views illustrating a circulation of the circulation fluid. The elements of the power generation device **100** of the embodiment illustrated in FIG. **7** may be replaced with elements in FIG. **20** to constitute another power generation device. It should be noted that it is assumed that the other power generation device is, unless otherwise specified, configured similarly to the power generation device **100**. Schematically, the other power generation device is configured to supply the circulation fluid F from a feeding device to an upper storage tank **41** both when a float **48** moves to the upper side (+Z direction) and when the float **48** moves to the lower side (−Z direction).

The other power generation device includes a storage tank-side accommodation portion **4**, the upper storage tank **41**, a lower storage tank **42**, a power generation unit **43**, a main feeding device **44**, auxiliary feeding devices **45**, a main first pipe **461**A (first supply flow path), auxiliary first pipes

**461**B (first supply flow path), a main second pipe **462**A (second supply flow path), auxiliary second pipes **462**B (second supply flow path), a third pipe **463**, and check valves **47** in FIG. **20**. It should be noted that a total of two sets of the auxiliary feeding devices **45** are provided on both sides of the main feeding device **44**, but only one of the sets is denoted by reference signs and will be described.

(Regarding Other Power Generation Device—Storage Tank-Side Accommodation Portion, Each Storage Tank, Power Generation Unit, and Third Pipe)

The storage tank-side accommodation portion **4**, the upper storage tank **41**, the lower storage tank **42**, the power generation unit **43**, the third pipe **463**, and the float **48** in FIG. **20** have the same configurations as those with the same names in the embodiment.

(Regarding Other Power Generation Device—Main Feeding Device)

The main feeding device **44** in FIG. **20** is a feeding device that feeds the circulation fluid F toward the predetermined height position based on the wave force received by the float **48**, and is a feeding device accommodated in a hollow portion of the float **48**. The main feeding device **44** is, for example, a first feeding device that feeds the circulation fluid F to the predetermined height position when the float **48** moves upward based on the wave force received by the float **48**.

The main feeding device **44** includes, for example, a bellows tube **441** and a duct tube **442**, and is configured similarly to the feeding device **24** of the embodiment.

(Regarding Other Power Generation Device—Auxiliary Feeding Device)

The auxiliary feeding device **45** in FIG. **20** is a feeding device that feeds the circulation fluid F toward the predetermined height position based on the wave force received by the float **48**, and is a feeding device accommodated in the hollow portion of the float **48**. The auxiliary feeding device **45** is, for example, a second feeding device that feeds the circulation fluid F to the predetermined height position when the float **48** moves downward based on a wave force received by the float **48**. For example, the auxiliary feeding device **45** is a device which supplies the circulation fluid F to the upper storage tank **41** by raising the circulation fluid F through the auxiliary first pipe **461**B, and to which the circulation fluid F is supplied through the auxiliary second pipe **462**B. The auxiliary feeding device **45** includes, for example, a bellows tube **451** and a connection member **452**.

(Regarding Other Power Generation Device—Auxiliary Feeding Device—Bellows Tube) The bellows tube **451** in FIG. **20** is a bellows tube in which the circulation fluid is stored, and is a bellows tube of which the volume (namely, the volume of a hollow portion of the bellows tube **451**) increases or decreases according to the up-down movement of the float **48** based on the wave force.

An upper end portion (+Z direction) of the bellows tube **451** is fixed to an upper portion **452**A of the connection member **452** in FIG. **21**, and a lower end portion (−Z direction) of the bellows tube **451** is connected and fixed to a communication portion **460** in FIG. **21**.

The communication portion **460** is a portion communicating with the inside (namely, the hollow portion) of the bellows tube **451**, the auxiliary first pipe **461**B, and the auxiliary second pipe **462**B, and is a portion fixed to a storage tank-side accommodation portion **4** side. Namely, the circulation fluid F is movable between the inside of the bellows tube **451**, the auxiliary first pipe **461**B, and the auxiliary second pipe **462**B via the communication portion **460**. It should be noted that the communication portion **460** may be interpreted as an element of the auxiliary feeding device **45**.

(Regarding Other Power Generation Device—Auxiliary Feeding Device—Connection Member) The connection member **452** in FIG. **20** is a member connecting the upper end portion (+Z direction) of the bellows tube **451** to the float **48**, and as illustrated in FIG. **21**(*b*), is an L-shaped member. A lower end portion (−Z direction) of the connection member **452** is fixed to a bottom of the float **48**. Since the bellows tube **451** is connected to the bottom of the float **48** via the connection member **452**, when the float **48** moves to the upper side (+Z direction), the bellows tube **451** is pulled by the upper portion **452**A of the connection member **452** to expand, and the volume of the bellows tube **451** increases. On the other hand, when the float **48** moves to the lower side (−Z direction), the bellows tube **451** contracts by being pushed by the upper portion **452**A of the connection member **452**, and the volume of the bellows tube **451** increases.

(Regarding Other Power Generation Device—First Pipe) The main first pipe **461**A in FIG. **20** is configured similarly to the first pipe **251** in FIG. **7**. The auxiliary first pipe **461**B in FIG. **20** is a first supply flow path that supplies the circulation fluid F fed by the auxiliary feeding device **45** to the predetermined height position, and for example, is fixedly provided on the storage tank-side accommodation portion **4** side. A lower end portion of the auxiliary first pipe **461**B is connected to the bellows tube **451** of the auxiliary feeding device **45** via the communication portion **460**, and an upper end portion of the auxiliary first pipe **461**B is provided on a lower storage tank **42** side.

(Regarding Other Power Generation Device—Second Pipe) The main second pipe **462**A in FIG. **20** is configured similarly to the second pipe **252** in FIG. **7**. The auxiliary second pipe **462**B in FIG. **20** is a second supply flow path that returns the circulation fluid F at the predetermined height position to the auxiliary feeding device **45**, and specifically, is a flow path that returns the circulation fluid F in the upper storage tank **41** to the auxiliary feeding device **45** via the lower storage tank **42**. A lower end portion of the auxiliary second pipe **462**B is connected to the bellows tube **451** of the auxiliary feeding device **45** via the communication portion **460**, and an upper end portion of the auxiliary second pipe **462**B is connected to a bottom of the lower storage tank **42**. For example, a flow path diameter of the auxiliary second pipe **462**B may be configured to be larger than a flow path diameter of the auxiliary first pipe **461**B.

(Configuration—Check Valve)

The check valves **47** in FIG. **20** allow the circulation fluid F to flow in directions indicated by arrows in FIG. **20** (a direction from the lower storage tank **42** toward the auxiliary feeding device **45** and a direction from the auxiliary feeding device **45** toward the upper storage tank **41**), and prevent a backflow.

(Circulation)

Next, a circulation of the circulation fluid F in the other power generation device will be described.

First, when the float **48** moves to the upper side (+Z direction) as illustrated in FIG. **22**, similarly to the case described in the embodiment, the circulation fluid F is supplied from the main feeding device **44** to the upper storage tank **41** through the main first pipe **461**A. Then, the circulation fluid F stored in the upper storage tank **41** is supplied to the lower storage tank **42** through the third pipe **463** due to the own weight of the circulation fluid F. It should be noted that the power generation unit **43** generates electricity using the energy of the circulation fluid F.

In this case, the float **48** approaches the storage tank-side accommodation portion **4**, the distance between the upper portion **452**A of the connection member **452** and the communication portion **460** in FIG. **21** in the height direction (Z-axis direction) is increased, and the bellows tube **451** is pulled by the upper portion **452**A of the connection member **452** to expand. Then, since the volume of the bellows tube **451** increases and the circulation fluid F in the communication portion **460** is taken into the bellows tube **451**, the circulation fluid F is supplied from the lower storage tank **42** to the auxiliary feeding device **45** through the auxiliary second pipe **462**B.

Next, when the float **48** moves to the lower side (−Z direction) as illustrated in FIG. **23**, similarly to the case described in the embodiment, the annular fluid F is supplied from the lower storage tank **42** to the main feeding device **44** through the main second pipe **462**A.

In this case, the float **48** moves away from the storage tank-side accommodation portion **4**, the distance between the upper portion **452**A of the connection member **452** and the communication portion **460** in FIG. **21** in the height direction (Z-axis direction) is reduced, and the bellows tube **451** is pushed by the upper portion **452**A of the connection member **452** to contract. Then, the volume of the bellows tube **451** decreases, the circulation fluid F in the bellows tube **451** is pushed out to a communication portion **460** side, and the circulation fluid F is supplied from the auxiliary feeding device **45** to the upper storage tank **41** through the auxiliary first pipe **461**B.

With such a configuration, for example, by providing the main feeding device **44** and the auxiliary feeding devices **45**, the circulation fluid F can be fed to the predetermined height position both when the float **48** moves upward and when the float **48** moves downward, so that the usage efficiency of a wave can be improved, and the electricity generation efficiency can be improved.

(Regarding Seawater Storage Portion)

FIGS. **24** to **27** are cross-sectional views illustrating the inside of a power generation device. A housing **511** in FIG. **24** may be used instead of the housing **1** of the power generation device **100** of the embodiment. The housing **511** includes a front side opening portion **512**, a seawater storage portion **513**, a drainage opening portion **514**, and an internal front side inclined portion **515**.

The front side opening portion **512** has the same configuration as that with the same name in the embodiment. The seawater storage portion **513** is a portion that stores seawater inside the housing **511**. The drainage opening portion **514** includes a plurality of opening portions for draining at least some of the seawater stored in the seawater storage portion **513** to the outside of the housing **511**. The internal front side inclined portion **515** is a first inner inclined portion extending from the front side opening portion **512** toward the float **27** inside the housing **511**, and is a first inner inclined portion inclined to be located upward (+Z direction) as the first inner inclined portion extends away from the front side opening portion **512**.

First, as illustrated in FIG. **25**, when a wave hits the front side (+X direction) of the housing **511**, the wave is taken into a hollow portion of the housing **511** through the front side opening portion **512**, and the water surface inside the housing **511** rises. In this case, as illustrated in FIG. **26**, the float **27** moves to the upper side (+Z direction) due to buoyancy.

Thereafter, some of the seawater in the seawater storage portion **513** is drained through the drainage opening portion **514**, and as illustrated in FIG. **27**, the water surface inside the housing **511** descends. In this case, the float **27** moves to the lower side (−Z direction) due to its own weight.

(Regarding Maintaining Member)

FIG. **28** is a cross-sectional view illustrating the inside of a power generation device. A maintaining member may be provided for the power generation device **100** of the embodiment. The "maintaining member" is a member that maintains the storage amount of the fluid in the upper storage member within a predetermined range.

For example, as illustrated in FIG. **28**, a first maintaining portion **521** and a second maintaining portion **522** may be provided.

The first maintaining portion **521** is a maintaining member, specifically, a first maintaining portion that maintains the amount of the circulation fluid F in the upper storage tank **21** at a lower limit storage amount or more. For example, when the amount of the circulation fluid F reaches the lower limit storage amount, the first maintaining portion **521** closes an end portion on the upper storage tank **21** side of the third pipe **253**. The configuration of the first maintaining portion **521** is optional, and may include, for example, a float **521**A, a plug **521**B, and a weight **521**C.

Since the inside of the third pipe **253** can be constantly filled with the circulation fluid F by providing the first maintaining portion **521** in such a manner, air can be prevented from being supplied to the power generation unit **23** and causing a malfunction of the power generation unit **23**.

The second maintaining portion **522** is a maintaining member, specifically, a second maintaining portion that maintains the amount of the circulation fluid F in the upper storage tank **21** at an upper limit storage amount or less. For example, when the amount of the circulation fluid F exceeds the upper limit storage amount, the second maintaining portion **522** supplies the circulation fluid F in excess of the upper limit storage amount in the upper storage tank **21** to the lower storage tank **22**. The configuration of the second maintaining portion **522** is optional, and may be configured using, for example, a pipe or the like of which an upper end portion (+Z direction) and a lower end portion (−Z direction) are open. It should be noted that FIG. **28** illustrates a case where a lower end portion (−Z direction) of the second maintaining portion **522** is provided underwater in the circulation fluid F in the lower storage tank **22**, but the lower end portion may be provided on the upper side (+Z direction) with respect to the water surface.

With such a configuration, the power generation system can be appropriately operated, for example, by maintaining the storage amount of the circulation fluid F at a storage amount within the predetermined range.

(Regarding Guide Member)

FIG. **29** is a side view of a power generation device. A guide member may be provided for the power generation device **100** of the embodiment. The "guide member" is a member that guides the system-side accommodation member to the front side of the system-side accommodation member when the system-side accommodation member floats up after submerging.

For example, as illustrated in FIG. **29**(*a*), a total of six floats **531** may be provided, specifically, three floats **531** may be provided on each of both side surfaces (the +Y direction and the −Y direction) of the housing **1** in FIG. **1**. The float **531** is a guide member, and has, for example, an elliptical shape in a side view, and is inclined such that long sides of the ellipse are aligned with an oblique direction.

When a high wave surges toward the front side (+X direction) of the housing **1**, as described in the embodiment, the housing **1** submerges under the sea surface. In this case, it is assumed that the housing **1** moves toward the back side (−X direction) in the sea based on the wave force of the high wave. In such a case, since the floats **531** are provided in a state where the floats **531** are obliquely directed, when the housing **1** floats up from the sea, the housing **1** is guided (namely, moved) to the front side (+Z direction), so that the power generation device can be prevented from being swept away by the high wave.

In addition, for example, instead of the floats **531** in FIG. **29**(*a*), fins **532** or **533** (guide members) illustrated in FIG. **29**(*b*) or **29**(*c*) may be provided for the housing **1**, or the guide members illustrated in the drawings may be optionally combined and provided. It should be noted that the number and installation positions of the guide members provided on the housing **1** may be optionally changed.

(Regarding Plurality of Sets of Feeding Devices and the Like)

FIG. **30** is a cross-sectional view illustrating a part of the inside of a power generation device. Instead of the housing **1** of the power generation device **100** of the embodiment, a housing **1**A having a comparatively large size in FIG. **30** may be used, and a plurality of sets (for example, three sets or the like) of the elements in FIG. **7** may be provided for the housing **1**A.

(Regarding Intake Plate)

FIG. **31** is a perspective view of a housing, and FIG. **32** is a plan view illustrating the inside of the housing. A housing **541** in FIG. **31** may be used instead of the housing **1** of the power generation device **100** of the embodiment.

For example, as illustrated in FIG. **32**, the front side (+X direction) of the housing **541** has an arc shape in a plan view, and as one example, includes a front side opening portion **542** and an intake plate **543**.

The front side opening portion **542** has the same configuration as that with the same name in the embodiment. The intake plate **543** in FIGS. **31** and **32** is an intake plate provided in the front side opening portion **542**, and is a plate member that takes waves into the inside of the housing **541** upon being hit by the waves. The intake plate **543** is provided, for example, along the X-axis direction in the vicinity of the center of the front side opening portion **542** with respect to the left-right direction (Y-axis direction). A length of the intake plate **543** in the height direction (Z-axis direction) may be set to be the same as or slightly shorter than a length of the front side opening portion **542** in the height direction.

With such a configuration, for example, when waves surge in directions indicated by arrows A**11** to A**13** in FIG. **32**, more waves can be taken into the inside of the housing **541**. Specifically, in a case where the intake plate **543** is not present, waves between the arrow A**11** and the arrow A**12** (namely, waves supplied between end portions **544** on both sides of the front side opening portion **542** in the left-right direction (Y-axis direction)) can be taken in. On the other hand, in a case where the intake plate **543** is provided, waves between the arrow A**11** and the arrow A**13** (namely, waves supplied between the end portion **544** on one side of the front side opening portion **542** in the left-right direction (Y-axis direction) and the intake plate **543**), namely, as many waves as there are between the arrow A**12** and the arrow A**13** can be taken in.

With such a configuration, since waves can be sufficiently taken into the inside of the housing **541**, for example, by providing the intake plate **543** that takes waves into the inside of the housing **541** upon being hit by the waves, electricity can be appropriately generated.

(Regarding Housing)

FIGS. **33** and **34** are cross-sectional views illustrating the inside of a power generation device, FIG. **35** is a view of a housing, and FIGS. **36** to **39** are perspective views of the housing. The housing in each drawing may be used instead of the housing **1** of the power generation device **100** of the embodiment. Regarding each housing, it is assumed that only feature portions will be described below, and portions of which description is omitted are configured similarly to the housing **1**.

A housing **551** in FIG. **33** includes a protruding portion **552**. The protruding portion **552** is a portion that accommodates the elements in FIG. **7**, and for example, is a portion protruding toward the upper side (+Z direction).

A housing **561** in FIG. **34** is a housing having a vibration control structure that absorbs swing of the housing **561** caused by waves. Specifically, by configuring a protruding portion **562** of the housing **561** such that a plurality of portions divided in the height direction (Z-axis direction) are stacked on each other, the stacked portions are configured to swing independently of each other in the horizontal direction. In FIG. **34**, a connection portion **563** is a boundary between the portions, and portions above and below the boundary are configured to swing independently of each other in the horizontal direction. Then, each portion is connected using a vibration damper for absorbing each swing of each portion. In such a manner, the vibration control structure may be achieved. It should be noted that the vibration control structure of the housing **561** may be achieved using any technique used for vibration control structures of buildings. Namely, the vibration control structure may be achieved by providing a vibration control device on the housing **561** instead of the stacked structure. It should be noted that, as described above, in the case of the stacked structure, after omitting the storage tank-side accommodation portion **2** in FIG. **7**, the upper storage tank **21** (refer to FIG. **7**) may be fixed to one of the plurality of divided portions of the protruding portion **562** in FIG. **34**, and the lower storage tank **22** (refer to FIG. **7**) may be fixed to another one of the plurality of divided portions of the protruding portion **562** (namely, a portion other than the portion to which the upper storage tank **21** is fixed).

Housings **571** and **572** in FIGS. **35**(*a*) and **35**(*b*) are housings that adopt a shape corresponding to the shape of a bottom of a general ship, and a housing **573** in FIG. **35**(*c*) is a housing that adopts a shape corresponding to a so-called streamlined shape.

Housings **574** and **575** in FIGS. **36** and **37** are housings that adopt main bodies having a comparatively low height and protruding portions **574**A and **575**A protruding from the main bodies. It should be noted that the protruding portions **574**A and **575**A are portions that accommodate the elements in FIG. **7**.

A housing **576** in FIG. **38** is a housing formed by providing wall portions **576**A in FIG. **38** on the housing **574** in FIG. **36**. The wall portions **576**A are, for example, members that form a flow path of seawater that rises up an upper surface (+Z direction) of a main body (portion on which the wall portions **576**A are provided) of the housing **576** due to a high wave. Since the wall portions **576**A are provided in such a manner, a high wave rises up the flow path, and the housing **576** sinks in the sea, so that the swing of the housing **576** due to the high wave can be suppressed.

A housing **577** in FIG. **39** is a housing formed by providing a cavity **577**Z in FIG. **39** in the vicinity of the center of the protruding portion **574**A with respect to the height direction (Z-axis direction) on the housing **574** in FIG. **36**, and by dividing the protruding portion **574**A into a first portion **577**A and a second portion **577**B with the cavity **577**Z interposed therebetween. The first portion **577**A is a portion that accommodates the upper storage tank **21** in FIG. **7**. The second portion **577**B is a portion that accommodates the lower storage tank **22** and the like in FIG. **7**. Then, the first portion **577**A may be supported using a plurality of pillar members **577**C. Then, as illustrated in FIG. **39**, the first pipe **251** and the second pipe **252** may be exposed. With such a configuration, when strong wind blows against the housing **577**, some of the strong wind blows through the cavity **577**Z, so that the swing of the housing **577** due to the strong wind can be reduced.

(Regarding Retention Member)

FIG. **40** is a side view of the housing in a floated state. It should be noted that in FIG. **40**, the detailed shape (elements related to the outer flow paths **14** and the like) of the housing **1** is not illustrated (the same applies to FIGS. **41** to **44** to be described later). A retention member may be provided for the housing **1** of the power generation device **100** of the embodiment. The "retention member" is a member that retains the system-side accommodation member at a predetermined position.

For example, retention portions **611** in FIG. **40**(*a*) may be provided for the housing **1**. The retention portions **611** are retention members, and for example, are suspended from the housing **1** using any wire-shaped body such as a rope or a chain. The retention portions **611** can be configured using a flat plate member or the like with a shape having a certain extent (for example, a circular shape having a diameter of approximately 3 m to 5 m or the like). Since resistance due to seawater during the movement of the housing **1** is increased by the retention portions **611**, so that the housing **1** can be retained.

It should be noted that the installation positions of the retention portions **611** are optional, and for example, as illustrated in FIG. **40**(*a*), the retention portions **611** may be provided at positions not reaching the seabed, or may be placed and provided on the seabed.

For example, retention portions **612** and **613** in FIG. **40**(*b*) may be provided for the housing **1**. The retention portions **612** are retention members, and for example, are basically the same as the retention portions **611** described above, but are partially different in shape. The retention portion **613** is a retention member, and is, for example, a weight. It should be noted that the retention portions **611** to **613** in the drawings may be optionally combined and provided for the housing **1**, or the number of the retention portions that are provided may be optionally changed. It should be noted that since the retention portions **611** to **613** become resistances when the housing **1** moves, the retention portions **611** to **613** also exhibit a function of preventing swing of the housing **1**.

(Regarding Suppressing Floating Body)

FIGS. **41** to **43** are side views of the housing and the like in a floated state. A suppressing floating body may be used by being coupled to the housing **1** of the power generation device **100** of the embodiment. The "suppressing floating body" is used to suppress swing of the system-side accommodation member caused by waves, and the suppressing floating body floats at a position away from the system-side accommodation member, and for example, is coupled to the system-side accommodation member above or under the water.

For example, a floating object **622** in FIG. **41** may be used. The floating object **622** is a suppressing floating body, for example, any floating object floating on the sea surface, and for example, a floating object having a smaller size than the housing **1** and having an outer shape similar to that of the housing **1** (it should be noted that it is assumed that a front side opening portion is not provided) or a floating object having another shape may be used.

Then, the floating object **622** and the housing **1** are coupled to each other using a coupling member **623** provided in the sea. It should be noted that it is preferable that as the coupling member **623**, for example, a member having comparatively high rigidity, such as a wood or metal member, is used from the viewpoint of forming floating objects including the floating object **622**, the housing **1**, and the coupling member **623** as one unit. It should be noted that from the viewpoint of suppressing swing caused by a wave, it is preferable that a total length from the floating object **622** to the housing **1** is configured to be equal to or more than a half (for example, approximately 30 m) of the wavelength (for example, approximately 60 m) of the wave.

In the case of such a configuration, since the floating object **622**, the housing **1**, and the coupling member **623** float as one unit, the swing of the housing **1** due to a wave can be suppressed. In addition, since the coupling member **623** is provided in the sea, the coupling member **623** is difficult to see from a side above the sea, and the scenery can be maintained.

It should be noted that the floating object **622** and the coupling member **623** may also be interpreted as configurations of the power generation device **100** (namely, elements of the power generation system) of the embodiment (the same applies to a retention portion **621**, a floating object **631**, and a coupling member **632** to be described later).

In addition, the retention portion **621** may be optionally provided for the housing **1** in FIG. **1**. The retention portion **621** is the retention member described above, and is, for example, a weight placed on the seabed. For example, the retention portion **621** may be fixed to the housing **1** using any wire-shaped body **624** such as a rope or a chain.

The retention portion **621** may be connected and fixed to the floating object **622**. Alternatively, as illustrated in FIG. **42**, the retention portion **621** may be connected to and fixed to both the housing **1** and the floating object **622**. For example, a comparatively long wire-shaped body may be used as the wire-shaped body **624**. The wire-shaped body **624** may be passed through a connection portion **621**A having a ring shape and provided on the retention portion **621**, and both ends of the wire-shaped body **624** may be connected and fixed to the housing **1** and the floating object **622**. It should be noted that it is assumed that the wire-shaped body **624** is inserted into a hole of the ring of the connection portion **621**A, and is movable toward a housing **1** side or a floating object **622** side.

With such a configuration, for example, when the housing **1** is lifted to a comparatively high position by a high wave, the floating object **622** is pulled via the wire-shaped body **624**, so that the housing **1** and the floating object **622** swing in synchronization with each other. Therefore, swing can be cancelled out, and the degree of the swing can be suppressed.

For example, the floating object **631** in FIG. **43** may be used. The floating object **631** is a suppressing floating body, and has, for example, the same configuration as the floating object **622** in FIG. **41**.

The floating object **631** and the housing **1** are coupled to each other using the coupling member **632** provided above the sea. It should be noted that the coupling member **632** has, for example, the same configuration as the coupling member **623** in FIG. **41**.

In the case of such a configuration, since the floating object **631**, the housing **1**, and the coupling member **632** float as one unit, the swing of the housing **1** due to a wave can be suppressed. In addition, since the coupling member **632** is provided above the sea, maintenance of the coupling member **632** itself is facilitated, and since the coupling member **632** can be used as a scaffold, a worker easily comes and goes between the housing **1** and the floating object **631**, and maintainability of the power generation system can be improved.

(Regarding Suppressing Extension)

FIG. **44** is a side view of the housing and the like in a floated state. A suppressing extension may be provided for the housing **1** of the power generation device **100** of the embodiment. The "suppressing extension" is used to suppress swing of the system-side accommodation member caused by waves, and extends from the system-side accommodation member along the water surface in the vicinity of the water surface.

For example, a suppressing object **641** in FIG. **44** may be provided for the housing **1**. The suppressing object **641** is a suppressing extension, and has, for example, a flat plate shape extending from an outer surface (a front surface, a side surface, or a back surface) of the housing **1** to the sea surface (namely, along the water surface) and has, for example, a flat plate shape. The width (width in a direction from a front side toward a back side of the drawing sheet of FIG. **44**) of the suppressing object **641** may be equal to or slightly narrower than the width of the housing **1** in the left-right direction (Y-axis direction in FIG. **1**). From the viewpoint of suppressing swing caused by a wave, it is preferable that the length (X-axis direction) of the suppressing object **641** is configured such that a total length of the housing **1** and the suppressing object **641** is equal to or more than a half (for example, approximately 30 m) of the wavelength (for example, approximately 60 m) of the wave.

In addition, the shape of the suppressing object **641** is not limited to a flat plate shape, and the suppressing object **641** may be configured by arranging a plurality of rod-shaped objects in the direction from the front side toward the back side of the drawing sheet of FIG. **44**. In addition, the suppressing object **641** may be made of a material having a comparatively large buoyancy with respect to its own weight when the suppressing object **641** sinks in the sea.

In the case of such a configuration, when at least a part of the suppressing object **641** sinks due to a high wave, the suppressing object **641** and the housing **1** float as one unit, so that the swing of the housing **1** due to the wave can be suppressed.

(Regarding Shape)

In addition, the shape of each element may be optionally changed as long as the function of each element can be exhibited. For example, the outer shape of the storage tank-side accommodation portion **2** and the float **27** in FIG. **7** may be a circular shape or a polygonal shape in a plan view.

(Regarding Other Features)

In addition, an entry prevention member that prevents entry of an object such as fish or dust may be provided for the front side opening portion **16** of the housing **1**. For example, a net or the like may be used as the entry prevention member.

In addition, a lid may be provided for each storage tank in FIG. **7** to prevent the circulation fluid F from spilling. In addition, as illustrated, a lower end portion (−Z direction) of the third pipe **253** in FIG. **7** may be provided in the circulation fluid F in the lower storage tank **22**, or may be provided on the upper side (+Z direction) with respect to the water surface of the circulation fluid F.

(Regarding Interpretation of Terms)

In addition, the power generation device **100**, the other power generation device, or a configuration having features related to the power generation device **100** or the other power generation device may be interpreted as a "power generation system".

(Application Example)

For example, the place where the power generation system is used is optional as long as waves occur at the place, and for example, the power generation system may be used in the sea or a lake where waves naturally occur, an artificial pond where artificial waves occur, a pool, or the like.

(Other Features)

In addition, for example, a plurality of sets of the third pipes **253** and the power generation units **23** may be provided between the upper storage tank **21** and the lower storage tank **22** in FIG. **7**.

In addition, for example, the number of the second pipes **252** in FIG. **7** is optional, and for example, only one second pipe **252** or three or more second pipes **252** may be provided for the feeding device **24**.

In addition, after the size of the upper storage tank **21** and the lower storage tank **22** in FIG. **7** is increased, the storage tank-side accommodation portion **2** may be omitted, and the upper storage tank **21** and the lower storage tank **22** may be directly fixed to the housing **1**. It should be noted that in this case, a plurality of combinations in each of which one or more (for example, two or the like) feeding devices **24** are provided for one float **27** (hereinafter, referred to as "sets of the floats and the feeding devices") may be provided inside the housing **1**. For example, a specific method for providing the "sets of the floats and the feeding devices" is optional, and for example, a plurality of sets of the floats and the feeding devices may be arranged from the front side (+X direction) toward the back side (−X direction), a plurality of sets of the floats and the feeding devices may be arranged along the side direction (Y-axis direction), or a combination thereof may be arranged. Namely, for example, by arranging four sets from the front side (+X direction) toward the back side (−X direction) and arranging two sets along the side direction (Y-axis direction), eight (=4 (sets)×2 (sets)) "sets of the floats and the feeding devices" may be provided in one housing **1**. It should be noted that the shape and size of the housing **1** referred to here may be optionally determined according to the number of the "sets of the floats and the feeding devices".

(Regarding Combination and Omission of Features)

In addition, each feature described in the embodiment or each feature described in the modification examples may be optionally selected and combined, or may be omitted. For example, the outer flow paths **14** may be omitted from the housing **1** in FIG. **1**. In addition, the internal front side inclined portion **17** or the internal side inclined portions **18** in FIGS. **5** and **8** may be omitted. In addition, for example, the storage tank-side accommodation portion **2** in FIG. **7** may be omitted, and the upper storage tank **21** and the like may be directly provided inside the housing **1**. In addition, for example, the configuration may be such that the lower storage tank **22** in FIG. **7** is omitted and the circulation fluid F in the upper storage tank **21** is directly supplied to the feeding device **24**.

(Regarding Variation of Shape of Float)

FIG. **45** is a view illustrating various shapes of floats. It should be noted that in FIGS. **45**(*a*) to **45**(*f*), variations of the shape of the float are illustrated, and specifically, the shapes of the floats when viewed from the side are illustrated. Namely, when a float in FIG. **45** is installed inside the housing of the power generation device, a front side opening portion is provided in one of a left direction and a right direction of the drawing of FIG. **45**. The float **27** and the like in FIG. **6** may be configured as a float having a shape illustrated in FIG. **45**.

(Regarding Installation of Plurality of Floats)

FIG. **46** is a cross-sectional view illustrating a part of the inside of a power generation device. Instead of the housing **1** of the power generation device **100** of the embodiment, a housing **1**B having a comparatively large size in FIG. **46** may be used, and a plurality of floats may be provided for the housing **1**B. In FIG. **46**, it is assumed that a front side opening portion (not illustrated) of the housing **1**B is provided on the right side of the drawing (namely, it is assumed that the right side of the drawing of FIG. **46** is the front side). In addition, although not illustrated in FIG. **46**, it is assumed that an internal front side inclined porti on having the same configuration as the internal front side inclined portion **17** in FIG. **6** is provided in the housing **1**B. The shape of each float may be determined based on the result of performing an experiment or a simulation for confirming that the float is appropriately moved up and down for the generation of electricity by receiving a wave force, and for example, floats **701** to **705** in FIG. **46** may be arranged from the front side toward the back side.

It should be noted that although the configurations of the feeding device and the like are not illustrated in FIG. **46**, in practice, for example, elements (elements other than the float **27** in FIG. **7**, such as the feeding device **24**) necessary for the generation of electricity illustrated in FIG. **7** are assumed to also be provided.

(Regarding Advantageous Effects of Housing being Partially Inclined)

FIG. **47** is a front view of a housing. A housing **1**C in FIG. **47** may be adopted instead of the housing **1** of the power generation device **100** of the embodiment. The housing **1**C includes a first portion **11**C and a second portion **12**C. The first portion **11**C is, for example, a portion of which the cross-sectional area in the horizontal direction decreases as the portion moves toward the upper side (+Z direction) due to side surfaces being inclined. The second portion **12**C is a portion provided on an upper portion of the first portion **11**C, and is, for example, a portion having the same cross-sectional area at each height position.

In the housing **1**C, when the sea surface rises from the position of a line **711** to the position of a line **712** in FIG. **47** due to a high wave, the amount of an increase in buoyancy becomes comparatively small, and the increase speed of buoyancy becomes comparatively slow, so that the swing of the housing **1**C due to the buoyancy can be suppressed. Namely, for example, compared to a case where the first portion **11**C of the housing **1**C is not inclined and has the same cross-sectional areas at each height position as in the second portion **12**C, the first portion **11**C of the housing **1**C in FIG. **47** can reduce the volume of a portion located in the sea in response to the rise of the sea surface, so that the amount of an increase in buoyancy becomes comparatively small, and the increase speed of buoyancy becomes comparatively slow. As a result, the swing of the housing **1**C due to the buoyancy can be suppressed.

It should be noted that the effects of the invention described here can also be achieved in a housing having the same features as the first portion **11**C in FIG. **47** among the housings described in the embodiment or the modification examples.

One embodiment of the present invention provides a power generation system for generating electricity using a potential energy of a fluid raised to a predetermined height position by a wave force, the system comprising: a system-side accommodation member that floats, the system-side accommodation member including an intake opening portion for taking a wave into an inside of the system-side accommodation member on a front side of the system-side accommodation member; a floating body accommodated in the system-side accommodation member; a feeding device that feeds the fluid toward the predetermined height position based on a wave force received by the floating body due to the wave taken into the inside of the system-side accommodation member through the intake opening portion; and a power generation unit that generates the electricity using the potential energy of the fluid raised to the predetermined height position.

According to this embodiment, by feeding the fluid toward the predetermined height position based on the wave force received by the floating body and by generating electricity using the potential energy of the fluid raised to the predetermined height position, for example, electricity can be generated at low cost.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: a suppressing member that suppresses a swing of the system-side accommodation member caused by a wave of a predetermined wave height or more by causing at least a part of the system-side accommodation member to submerge in water when the suppressing member receives the wave.

According to this embodiment, by providing the suppressing member, for example, the swing of the system-side accommodation member due to a high wave can be suppressed, thereby appropriately generating electricity.

Another embodiment of the present invention provides the power generation system according to the above embodiment, wherein the suppressing member includes a first outer inclined portion provided on the front side of the system-side accommodation member, and the first outer inclined portion is inclined such that a wave of a predetermined wave height or more rises up the first outer inclined portion when the first outer inclined portion receives the wave.

According to this embodiment, by including the first outer inclined portion, for example, the swing of the system-side accommodation member due to a high wave can be suppressed, thereby appropriately generating electricity.

Another embodiment of the present invention provides the power generation system according to the above embodiment, wherein the suppressing member includes an outer flow path provided on a side surface side of the system-side accommodation member, and the outer flow path extends between the front side and a back side of the system-side accommodation member, and is configured such that a wave of a predetermined wave height or more rises up the outer flow path when the outer flow path receives the wave.

According to this embodiment, by including the outer flow path, for example, the swing of the system-side accommodation member due to a high wave can be suppressed, thereby appropriately generating electricity.

Another embodiment of the present invention provides the power generation system according to the above embodiment, wherein the suppressing member includes a second outer inclined portion provided on the front side of the system-side accommodation member, and the second outer inclined portion is continuous with the outer flow path, and is configured to guide a wave of a predetermined wave height or more to the outer flow path when the second outer inclined portion receives the wave.

According to this embodiment, when the second outer inclined portion receives a high wave, the wave can be guided onto the outer flow paths, for example, by guiding the wave to the outer flow paths, so that at least a part of the system-side accommodation member can be reliably submerged in the water, and the swing of the system-side accommodation member due to the high wave can be suppressed, thereby appropriately generating electricity.

Another embodiment of the present invention provides the power generation system according to the above embodiment, wherein the system-side accommodation member has a vibration control structure that absorbs a swing of the system-side accommodation member caused by a wave.

According to this embodiment, since the system-side accommodation member has a vibration control structure, for example, the swing of the system-side accommodation member due to the high wave can be suppressed, thereby appropriately generating electricity.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: a suppressing floating body that suppresses a swing of the system-side accommodation member caused by a wave, wherein the suppressing floating body floats at a position away from the system-side accommodation member, and the system-side accommodation member and the suppressing floating body are coupled to each other above or under water.

According to this embodiment, since the total length of the power generation system can be made comparatively long, for example, by coupling the system-side accommodation member and the suppressing floating body to each other above or under the water, the swing of the system-side accommodation member due to a high wave can be suppressed, and electricity can be appropriately generated.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: a suppressing extension that suppresses a swing of the system-side accommodation member caused by a wave, wherein the suppressing extension extends from the system-side accommodation member along a water surface in the vicinity of the water surface.

According to this embodiment, since the total length of the power generation system can be made comparatively long, for example, by providing the suppressing extension, the swing of the system-side accommodation member due to a high wave can be suppressed, and electricity can be appropriately generated.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: an upper storage member provided at the predetermined height position, the upper storage member being configured to store the fluid fed by the feeding device; and a storage member-side accommodation member that accommodates the upper storage member, wherein the storage member-side accommodation member is suspended from the system-side accommodation member inside the system-side accommodation member.

According to this embodiment, since the magnitude of swing of the system-side accommodation member due to a high wave can be prevented from being directly transmitted to the storage member-side accommodation member, for example, by suspending the storage member-side accommodation member from the system-side accommodation member inside the system-side accommodation member, the magnitude of the swing of the storage member-side accommodation member can be reduced.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: a guide member that guides the system-side accommodation member to the front side of the system-side accommodation member when the system-side accommodation member floats up after submerging.

According to this embodiment, when the system-side accommodation member floats up after submerging, the system-side accommodation member is guided to the front side of the system-side accommodation member. Therefore, for example, even when the power generation system receives a high wave from the front side, the power generation system can be prevented from being swept away by the high wave.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: a first inner inclined portion extending from the intake opening portion toward a floating body side inside the system-side accommodation member, the first inner inclined portion being inclined to be located upward as the first inner inclined portion extends away from the intake opening portion.

According to this embodiment, since the first inner inclined portion is provided, for example, the water depth inside the system-side accommodation member becomes shallower as the distance from the intake opening portion increases, so that the wave height inside the system-side accommodation member can be increased, and the wave force can be increased, thereby appropriately generating electricity.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: second inner inclined portions provided on both sides of the first inner inclined portion inside the system-side accommodation member, the second inner inclined portions being inclined more steeply than the first inner inclined portion.

According to this embodiment, since the amount of reflection of a wave inside the system-side accommodation member can be suppressed, for example, by providing the second inner inclined portions, the usage efficiency of the wave can be improved, and the electricity generation efficiency can be improved.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: a drainage adjustment member that adjusts a drainage time related to the wave taken into the inside of the system-side accommodation member, the drainage adjustment member being provided inside the system-side accommodation member.

According to this embodiment, since water (for example, seawater) can be retained inside the system-side accommodation member for a time sufficient for sufficiently feeding the fluid toward the predetermined height position, for example, by providing the drainage adjustment member, the fluid can be appropriately raised to the predetermined height position, and electricity can be appropriately generated.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: an intake plate provided in the intake opening portion, the intake plate being configured to take a wave into the inside of the system-side accommodation member upon being hit by the wave.

According to this embodiment, since waves can be sufficiently taken into the inside of the system-side accommodation member, for example, by providing the intake plate that takes waves into the inside of the system-side accommodation member upon being hit by the waves, electricity can be appropriately generated.

Another embodiment of the present invention provides the power generation system according to the above embodiment, further comprising: a retention member that retains the system-side accommodation member at a predetermined position.

According to this embodiment, by providing retention member that retains the system-side accommodation member at a predetermined position, for example, the power generation system can be prevented from being swept away by the high wave.

Another embodiment of the present invention provides the power generation system according to the above embodiment, wherein the fluid is a fluid formed of mixed water containing a chain polymer, and the power generation system floats in the sea.

According to this embodiment, since the fluid is a fluid formed of mixed water containing a chain polymer, for example, the fluid can be efficiently raised to the predetermined height position, so that the electricity generation efficiency can be improved.

REFERENCE SIGNS LIST

**1**: housing
**1**A: housing
**1**B: housing
**1**C: housing
**2**: storage tank-side accommodation portion
**4**: storage tank-side accommodation portion
**10**: hollow portion
**11**: housing-side front portion
**11**C: first portion
**12**: housing-side side portion
**12**C: second portion
**13**: housing-side back portion
**14**: outer flow path
**15**: front side inclined portion
**16**: front side opening portion
**17**: internal front side inclined portion
**18**: internal side inclined portion
**18**A: inner wall portion
**19**: internal bottom portion
**20**: suspension portion
**21**: upper storage tank
**22**: lower storage tank
**23**: power generation unit
**24**: feeding device
**24**A: feeding device
**27**: float
**31**: drainage adjustment portion
**32**: installation base
**33**: buffer material
**41**: upper storage tank
**42**: lower storage tank
**43**: power generation unit
**44**: main feeding device
**45**: auxiliary feeding device
**47**: check valve
**48**: float
**100**: power generation device
**141**: flow path side wall portion
**142**: flow path bottom portion
**241**: bellows tube
**242**: duct tube
**251**: first pipe
**251**A: upper end portion
**251**B: guide plate
**251**C: open portion
**252**: second pipe
**253**: third pipe
**261**: first pipe-side check valve
**262**: second pipe-side check valve
**27**A: hollow portion
**271**: first portion
**272**: second portion
**241**A: bellows tube
**242**A: duct tube
**441**: bellows tube
**442**: duct tube
**451**: bellows tube
**452**: connection member
**452**A: upper portion
**460**: communication portion
**461**A: main first pipe
**462**A: main second pipe
**461**B: auxiliary first pipe
**462**B: auxiliary second pipe
**463**: third pipe
**511**: housing
**512**: front side opening portion
**513**: seawater storage portion
**514**: drainage opening portion
**515**: internal front side inclined portion
**521**: first maintaining portion
**521**A: float
**521**B: plug
**521**C: weight
**522**: second maintaining portion
**531**: float
**532**: fin
**533**: fin
**541**: housing
**542**: front side opening portion
**543**: intake plate
**544**: end portion
**551**: housing
**552**: protruding portion
**561**: housing
**562**: protruding portion
**563**: connection portion
**571**: housing
**572**: housing
**573**: housing
**574**: housing
**574**A: protruding portion
**575**: housing
**574**A: protruding portion
**576**: housing
**576**A: wall portion
**577**: housing

**577**A: first portion
**577**B: second portion
**577**C: pillar member
**577**Z: cavity
**611**: retention portion
**612**: retention portion
**613**: retention portion
**621**: retention portion
**622**: floating object
**623**: coupling member
**624**: wire-shaped body
**621**A: connection portion
**631**: floating object
**632**: coupling member
**641**: suppressing object
**701**: float
**702**: float
**703**: float
**704**: float
**705**: float
**711**: line
**712**: line
**2711**: float
**2711**A: front portion
A**11**: arrow
A**12**: arrow
A**13**: arrow
D**1**: distance
F: circulation fluid

The invention claimed is:

**1**. A power generation system for generating electricity using a potential energy of a fluid raised to a predetermined height position by a wave force, the system comprising:

- a system-side accommodation member that floats, the system-side accommodation member including an intake opening portion for taking a wave into an inside of the system-side accommodation member on a front side of the system-side accommodation member;
- a floating body accommodated in the system-side accommodation member;
- a feeding device that feeds the fluid toward the predetermined height position based on a wave force received by the floating body due to the wave taken into the inside of the system-side accommodation member through the intake opening portion;
- a power generation unit that generates the electricity using the potential energy of the fluid raised to the predetermined height position; and
- a suppressing member that suppresses a swing of the system-side accommodation member caused by a wave of a predetermined wave height or more by causing at least a part of the system-side accommodation member to submerge in water when the suppressing member receives the wave,
- wherein the suppressing member includes an outer flow path provided on a side surface side of the system-side accommodation member, and
- wherein the outer flow path extends between the front side and a back side of the system-side accommodation member, and is configured such that a wave of a predetermined wave height or more rises up the outer flow path when the outer flow path receives the wave.

**2**. The power generation system according to claim **1**, wherein

- the suppressing member includes a first outer inclined portion provided on the front side of the system-side accommodation member, and
- the first outer inclined portion is inclined such that a wave of a predetermined wave height or more rises up the first outer inclined portion when the first outer inclined portion receives the wave.

**3**. The power generation system according to claim **1**, wherein

- the suppressing member includes a second outer inclined portion provided on the front side of the system-side accommodation member, and
- the second outer inclined portion is continuous with the outer flow path, and is configured to guide a wave of a predetermined wave height or more to the outer flow path when the second outer inclined portion receives the wave.

**4**. The power generation system according to claim **1**, wherein the system-side accommodation member has a vibration control structure that absorbs a swing of the system-side accommodation member caused by a wave.

**5**. The power generation system according to claim **1**, further comprising:

- a suppressing floating body that suppresses a swing of the system-side accommodation member caused by a wave, wherein
- the suppressing floating body floats at a position away from the system-side accommodation member, and
- the system-side accommodation member and the suppressing floating body are coupled to each other above or under water.

**6**. The power generation system according to claim **1**, further comprising:

- a suppressing extension that suppresses a swing of the system-side accommodation member caused by a wave, wherein the suppressing extension extends from the system-side accommodation member along a water surface in the vicinity of the water surface.

**7**. The power generation system according to claim **1**, further comprising:

- an upper storage member provided at the predetermined height position, the upper storage member being configured to store the fluid fed by the feeding device; and
- a storage member-side accommodation member that accommodates the upper storage member, wherein
- the storage member-side accommodation member is suspended from the system-side accommodation member inside the system-side accommodation member.

**8**. The power generation system according to claim **1**, further comprising:

- a guide member that guides the system-side accommodation member to the front side of the system-side accommodation member when the system-side accommodation member floats up after submerging.

**9**. The power generation system according to claim **1**, further comprising:

- a first inner inclined portion extending from the intake opening portion toward a floating body side inside the system-side accommodation member, the first inner inclined portion being inclined to be located upward as the first inner inclined portion extends away from the intake opening portion.

**10**. The power generation system according to claim **9**, further comprising:

- second inner inclined portions provided on both sides of the first inner inclined portion inside the system-side accommodation member, the second inner inclined portions being inclined more steeply than the first inner inclined portion.

11. The power generation system according to claim 1, further comprising:

a drainage adjustment member that adjusts a drainage time related to the wave taken into the inside of the system-side accommodation member, the drainage adjustment member being provided inside the system-side accommodation member.

12. The power generation system according to claim 1, further comprising:

an intake plate provided in the intake opening portion, the intake plate being configured to take a wave into the inside of the system-side accommodation member upon being hit by the wave.

13. The power generation system according to claim 1, further comprising:

a retention member that retains the system-side accommodation member at a predetermined position.

14. The power generation system according to claim 1, wherein

the fluid is a fluid formed of mixed water containing a chain polymer, and

the power generation system floats in the sea.

15. A power generation system for generating electricity using a potential energy of a fluid raised to a predetermined height position by a wave force, the system comprising:

a system-side accommodation member that floats, the system-side accommodation member including an intake opening portion for taking a wave into an inside of the system-side accommodation member on a front side of the system-side accommodation member;

a floating body accommodated in the system-side accommodation member;

a feeding device that feeds the fluid toward the predetermined height position based on a wave force received by the floating body due to the wave taken into the inside of the system-side accommodation member through the intake opening portion; and

a power generation unit that generates the electricity using the potential energy of the fluid raised to the predetermined height position,

wherein the system-side accommodation member has a vibration control structure that absorbs a swing of the system-side accommodation member caused by a wave,

wherein the system-side accommodation member is configured such that a plurality of portions divided in the height direction are stacked on each other,

wherein each of the plurality of portions is configured to swing independently of each other in the horizontal direction.

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