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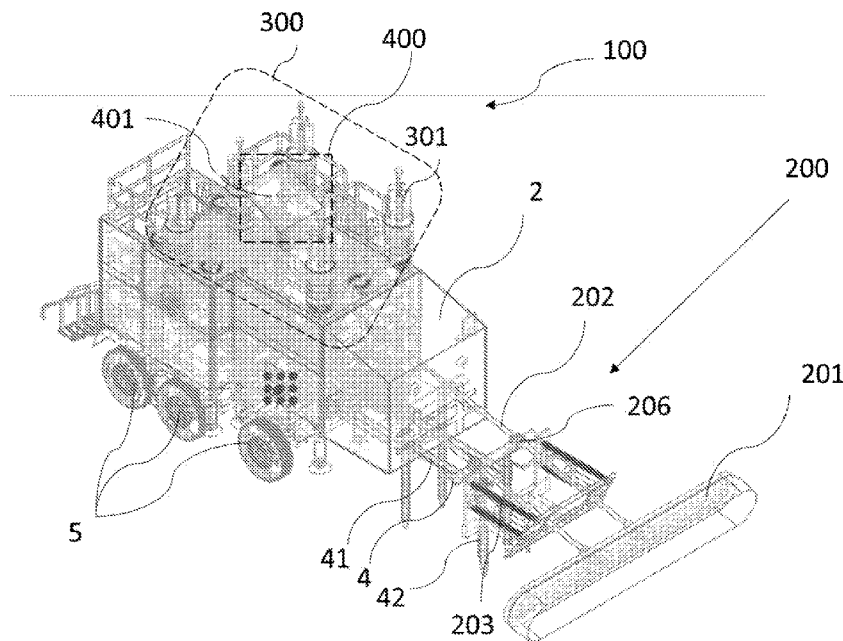


Figure 1a

(57) **Abstract:** The present disclosure discloses a vehicle (100) for power generation, transmission and storage is disclosed. The vehicle (100) comprises a frame (1), a body (2), a plurality of power conversion units, a gear mechanism (500), a generator unit (600) and a control unit (3). The body (2) is disposed with a plurality of conversion units comprising a first conversion unit (200), a second conversion unit (300) and a third conversion unit (400). The gear mechanism (500) is coupled to at least one of the first conversion unit (200) and the second conversion unit (300) and is configured to receive, convert and transmit motion from at least one of the first conversion unit (200) and the second conversion unit (300). With such configuration, the vehicle (100) may generate continuous power from tides and wind energy without substantial interruption in power generation.

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A VEHICLE FOR POWER GENERATION, TRANSMISSION AND STORAGE

TECHNICAL FIELD

Present disclosure, in general, relates to a field of electrical power generation. Particularly, but not exclusively, the present disclosure relates to renewable power generation, transmission, and storage. Further, embodiments of the present disclosure relate to a vehicle for continuous renewable power generation, transmission and storage.

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BACKGROUND OF THE DISCLOSURE

As greenhouse gas concentrations rise, climate change occurs, and the global impact of fossil fuel emissions increases, there is growing demand for generation and usage of zero carbon emission sources for power generation and consumption in order to meet market requirement.

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Currently, renewable energy contributes a small portion of society's energy requirement, while constantly efforts are being made to increase in such portion by utilizing various sources such as wind, solar, waves, geothermal, and amongst others.

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Although wave energy is a large source of renewable energy, in general, it may be considered as an underutilized source, as currently existing mechanisms and technologies are not economically competitive. This is due to high cost of the existing technology and/or requirement of infrastructure for harvesting such wave energy. In addition, the existing technology may pose a threat to marine life or cause other environmental damage by interrupting ocean/sea ecosystems.

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Conventionally, combined power generators exist, where two or more renewable energy sources are harvested to increase the power generated. Such combined power generators are often deployed in remote locations such as mid-sea areas to generate combined power from sea waves and wind at the mid-sea area. However, the harvesting wind energy at mid-sea areas requires installation of the wind turbines in the sea which may lead to corrosion of components of the combined power generators. Further, transmission of generated power from such remote locations may be difficult and may require submersed cables extending from mid-sea areas to the shore of the sea. Furthermore, variations in wind speed and intensity of the sea waves may cause interruptions in power generation.

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The present disclosure is directed to overcome one or more limitations stated above or any other limitations associated with the conventional mechanisms.

SUMMARY OF THE DISCLOSURE

One or more shortcomings of the prior art are overcome by a method and a system as claimed and additional advantages are provided through the method and the system as claimed in the present disclosure. Additional features and advantages are realized through the techniques of the present disclosure. Other embodiments and aspects of the disclosure are described in detail herein and are considered a part of the claimed disclosure.

In one non-limiting embodiment of the present disclosure a vehicle for power generation, transmission and storage is disclosed. The vehicle comprises a frame, a body, a plurality of power conversion units, a gear mechanism, a generator unit and a control unit. The body is coupled to the frame and defines a plurality of sections being exposed to the surroundings. The plurality of power conversion units are disposable on the body. The plurality of power conversion units comprises a first conversion unit, a second conversion unit and a third conversion unit. The first conversion unit is movably disposed in a first section of the plurality of sections of the body. The second conversion unit is positioned in a second section of the plurality of sections of the body. The third conversion unit is positioned in at least one of the first section and the second section of the plurality of sections of the body. The gear mechanism is coupled to at least one of the first conversion unit and the second conversion unit. The gear mechanism is configured to receive, convert and transmit motion from at least one of the first conversion unit and the second conversion unit.

The generator unit is coupled to the gear mechanism and is configured to generate power based on operation of the gear mechanism, from at least one of the first conversion unit and the second conversion unit. The control unit is communicatively coupled to one or more sensors disposed proximal to the gear mechanism and the generator unit. The control unit is operatively coupled to the gear mechanism, the generator unit, and the retraction mechanism. The control unit is configured to receive one or more signals corresponding to the power generated at the generator unit by each of the first conversion unit, the second conversion unit and the third conversion unit.

The control unit operates the gear mechanism to regulate power generated at the generator unit based on operation of the first conversion unit, the second conversion unit and the third conversion unit for continuous power generation, transmission and storage in the vehicle.

5 In an embodiment, the gear mechanism comprises a first gear mechanism connected to the first conversion unit and a second gear mechanism connected to the second conversion unit, wherein the first gear mechanism is connected to a first generator of the generator unit and the second gear mechanism is connected to a second generator of the generator unit.

10 In an embodiment, the first conversion unit being operable based on wave energy, the first conversion unit comprises a plate movably disposed in the first section of the body, the plate configured to engage with tides at an on-shore location, wherein the plate is configured to displace based on engagement with the tides and a first shaft connected to the plate, the first shaft being defined with a plurality of teeth and connected to a first gear mechanism, the first
15 shaft configured to transmit displacement of the plate to the first gear mechanism.

In an embodiment, the first gear mechanism comprises a first plurality of gears engaging with the first shaft, and wherein the first gear mechanism is configured to convert displacement of the first shaft to rotation motion for generation of power at the generator unit.

20 In an embodiment, the second conversion unit being operable based on wind energy, the second conversion unit comprises a vertical axis wind turbine mounted in the second section of the body, wherein the vertical axis wind turbine is defined with a second shaft connectable to the generator unit and the second gear mechanism.

25 In an embodiment, the third conversion unit being operable based on solar energy, the third conversion unit comprises a solar panel mounted in at least one of the first section and the second section.

30 In an embodiment, the second gear mechanism comprises a second plurality of gears connected to the second shaft of the second conversion unit and connected to a flywheel on one end disposed on an output shaft of the second gear mechanism.

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In an embodiment, the generator unit transmits the generated power from the first conversion unit and the second conversion unit to a power grid and/or a battery and wherein the first generator and the second generator are connected by the second gear mechanism.

- 5 In an embodiment, the control unit regulates the power generated at the generator unit to generate highest power generated from the first conversion unit, the second conversion unit and the third conversion unit.

10 In an embodiment, the vehicle comprises an adjustable guide mechanism disposed in the first section of the body to adjust horizontal position of the plate relative to the body of the vehicle based on the on-shore location and wherein the first conversion unit comprises a retraction mechanism connected between the adjustable guide mechanism and the plate to support and displace the plate upon engaging with the tides.

- 15 In an embodiment, the control unit is configured to selectively operate the retraction mechanism to displace the plate upon engagement with the tides.

20 In an embodiment, the first conversion unit comprises a guide plate defined with a slot mounted on the first section of the body and a pulley slidably disposed in the slot and connected to the first shaft to assist in adjustment of height of the first shaft and the plate.

25 The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

30 The novel features and characteristic of the disclosure are set forth in the appended claims. The disclosure itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed description of an illustrative embodiment when read in conjunction with the accompanying figures. One or more embodiments are now described, by way of example only, with reference to the accompanying figures wherein like reference numerals represent like elements and in which:

Figure 1a illustrates an isometric view of a vehicle for power generation, transmission and storage in accordance with an embodiment of the present disclosure.

Figure 1b illustrates a bottom view of the vehicle of Figure 1a in accordance with an embodiment of the present disclosure.

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Figure 1c illustrates an isometric view of a body of the vehicle with a first section and a second section in accordance with an embodiment of the present disclosure.

Figure 1d illustrates an isometric view of a second floor of the vehicle in accordance with an
10 embodiment of the present disclosure.

Figure 1e illustrates an isometric view of a first floor of the vehicle in accordance with an embodiment of the present disclosure.

15 Figure 1f illustrates an isometric view of the first floor of the vehicle with a plurality of positioners in accordance with an embodiment of the present disclosure.

Figure 1g illustrates a hydraulic positioner depicted in Figure 1f, in accordance with an embodiment of the present disclosure.

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Figure 2 illustrates a schematic view of a vertical axis wind turbine of a second conversion unit, in accordance with an embodiment of the present disclosure.

Figure 3 illustrates an isometric view of a generator unit and a gear mechanism connected to
25 the second conversion unit, in accordance with an embodiment of the present disclosure.

Figure 4 is an isometric view of a first conversion unit connected to a first gear mechanism, in accordance with an embodiment of the present disclosure.

30 Figure 5 isometric view of a first gear mechanism of the vehicle, in accordance with an embodiment of the present disclosure.

Figure 6 is an isometric view of a guide plate and a pulley of the vehicle, in accordance with an embodiment of the present disclosure.

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Figure 7 is an isometric view of the first conversion unit, in accordance with an embodiment of the present disclosure.

Figure 8a is a magnified view of the first conversion unit depicting an initial position of a first shaft, in accordance with an embodiment of the present disclosure.

Figure 8b is a magnified view of the first conversion unit depicting an intermediate position of the first shaft upon engagement of the plate with tides, in accordance with an embodiment of the present disclosure.

Figure 8c is a magnified view of the first conversion unit depicting a final position of the first shaft upon engagement of the plate with tides, in accordance with an embodiment of the present disclosure.

Figure 9a is a schematic view of a second gear mechanism, in accordance with an embodiment of the present disclosure.

Figure 9b is an isometric view of a second plurality of gears of the second gear mechanism, in accordance with an embodiment of the present disclosure.

The figures depict embodiments of the disclosure for purposes of illustration only. One skilled in the art will readily recognize from the following description that alternative embodiments of the system and method illustrated herein may be employed without departing from the principles of the disclosure described herein.

DETAILED DESCRIPTION

While the embodiments in the disclosure are subject to various modifications and alternative forms, specific embodiment thereof has been shown by way of example in the figures and will be described below. It should be understood, however that it is not intended to limit the disclosure to the particular forms disclosed, but on the contrary, the disclosure is to cover all modifications, equivalents, and alternative falling within the scope of the disclosure.

The terms “comprises”, “comprising”, or any other variations thereof used in the disclosure, are intended to cover a non-exclusive inclusion, such that a device, assembly, mechanism, system, that comprises a list of components does not include only those components but may include other components not expressly listed or inherent to such system, or assembly, or device. In other words, one or more elements in a system preceded by “comprises... a” does not, without more constraints, preclude the existence of other elements or additional elements in the system or method.

Embodiments of the present disclosure discloses a vehicle for power generation, transmission and storage is disclosed. The vehicle comprises a frame, a body, a plurality of power conversion units, a gear mechanism, a generator unit and a control unit. The body is coupled to the frame and defines a plurality of sections being exposed to the surroundings. The plurality of power conversion units are disposable on the body. The plurality of power conversion units comprises a first conversion unit, a second conversion unit and a third conversion unit. The first conversion unit is movably disposed in a first section of the plurality of sections of the body. The second conversion unit is positioned in a second section of the plurality of sections of the body. The third conversion unit is positioned in at least one of the first section and the second section of the plurality of sections of the body. The gear mechanism is coupled to at least one of the first conversion unit and the second conversion unit. The gear mechanism is configured to receive, convert and transmit motion from at least one of the first conversion unit and the second conversion unit. With such configuration, the vehicle may generate continuous power from tides and wind energy without substantial interruption in power generation. Further, the vehicle may be transported to a desired location to maximize power generation based on requirement and need for submersed cables to transmit the generated power from an on-shore location may be eliminated.

The disclosure is described in the following paragraphs with reference to Figures 1 to 9b. In the figures, the same element or elements which have same functions are indicated by the same reference signs. It is to be noted that, the vehicle is not illustrated in the figures for the purpose of simplicity. One skilled in the art would appreciate that the vehicle and assembly as disclosed in the present disclosure may be used in conjunction with any renewable energy source including but not liming to geothermal energy, hydro energy, and the like.

The system and the method of the present disclosure may also be implemented with renewable energy sources capable of rotating a generator without deviating from the principles of the present disclosure.

5 Figure 1a and Figure 1b illustrate an exemplary embodiment of the present disclosure which depicts a vehicle (100) for power generation, transmission and storage. The vehicle (100) comprises a frame (1), a body (2), a plurality of power conversion units, a gear mechanism (500), a generator unit (600) and a control unit (3). The body (2) may be coupled to the frame (1) of the vehicle (100). In an embodiment, the frame (1) may include a chassis configured to
10 bear load of other components of the vehicle (100) such as, but not limited to, the plurality of power conversion units, the gear mechanism (500), the generator unit (600), and the control unit (3) amongst others. The body (2) may include a power unit, a transmission coupled to the power unit and a plurality of wheels (5) coupled to the transmission to drive the vehicle (100) as can be seen in Figure 1b. However, the power unit of the vehicle (100) may be an engine or
15 a motor which may be driven by a battery and a plurality of motors electrically coupled to the battery and the same shall not be considered a limitation.

Referring now to Figure 1c, the body (2) of the vehicle may structured to resemble a passenger vehicle, a truck, a caravan and the like, where the body (2) may include a front portion, a rear
20 portion and a central portion defined between the front portion and the rear portion. In an embodiment, the front portion of the body (2) may be in a streamlined shape to improve aerodynamics of the car and the same shall not be considered a limitation. In an embodiment, the central portion of the vehicle (100) may include a first floor (23), a second floor (24) and a roof (25) and the number of floors may be increased based on requirement and the same shall
25 not be considered a limitation. The first floor (23) may be configured to house a control dashboard of the vehicle (100) including a steering, accelerator, brake and the like, to control the engine and/or motor and thereby control the vehicle (100) movement. The body (2) may comprise at least one first staircase (7) between the first floor (23) and the second floor (24) of the vehicle (100), and may include at least one second staircase (7') between the second floor
30 (24) and the roof (25) of the vehicle (100) as can be seen in Figures 1c and 1d. In an embodiment, the at least one first staircase (7) and the at least one second staircase (7') may be collapsible. The body (2) of the vehicle (100) may include a plurality of sections such as a first section (21) and a second section (22).

In the illustrative embodiment, the first section (21) is depicted as the front portion of the vehicle (100) and the second section (22) is depicted as a top portion/roof (25) of the vehicle (100). In an embodiment, the second section (22) may be selected from the rear portion, a left portion defined on left side of the central portion and a right portion defined on the right side of the central portion of the vehicle (100).

Referring now to Figure 1f and Figure 1g, the first floor (23) of the body (2) may be defined with a plurality of provisions to receive a plurality of hydraulic positioners (6) configured to position the vehicle (100) at the on-shore location, where the hydraulic positioners (6) may expand and retract to vary the height of the first floor (23) from the ground at the on-shore location as can be seen in Figure 1f. The hydraulic positioners (6) may include a base (61), a first hydraulic cylinder (62), a second hydraulic cylinder (63), at least one stopper (64), a support column (65) and a flange (66) as best seen in Figure 1g. The first hydraulic cylinder (62) and the second hydraulic cylinder (63) may be connected in series to the base (61) and may be extending vertically from the base (61). The support column (65) may be connected to the second hydraulic cylinder (63) and may be extending vertically upward, where the flange (66) may be defined at top of the support column (65). In an embodiment, the base (61) may be defined with a hemi-spherical profile where a flat face of the hemi-spherical profile may be in contact with the ground. The base (61) may be configured to receive and transmit weight of the vehicle (100) to the ground. The at least one stopper (64) may be defined on the support column (65) and may be configured to support at least one of the first floor (23) and the second floor (24) of the body (2), where the first hydraulic cylinder (62) and the second hydraulic cylinder (63) may be configured to vary the height of the vehicle (100) by expanding and contracting with respect to the ground thereby raising or lowering the vehicle (100) from the ground.

Referring again to Figure 1a, the vehicle (100) may include the plurality of power conversion units disposable on the body (2) of the vehicle (100). The plurality of power conversion units may include a first conversion unit (200), a second conversion unit (300) and a third conversion unit (400). The first conversion unit (200) may be disposed in the first section (21) of the vehicle (100), the second conversion unit (300) may be disposed in the second section (22) of the vehicle (100) and the third conversion unit (400) may be disposed in at least one of the first section (21) and the second section (22) of the plurality of sections of the body (2).

In the illustrative embodiment, the third conversion unit (400) may be disposed in the second section (22) of the body (2) and the same shall not be considered a limitation. Further, the first conversion unit (200) may be operable based on wave energy. The wave energy may be from a sea, an ocean and the like. In an embodiment, the vehicle (100) may be driven to an on-shore location and positioned such that at least a portion of the first conversion unit (200) may be in contact with the sea or the ocean.

Referring again to Figure 4, the first conversion unit (200) may include a plate (201) and a first shaft (202) connected to the plate (201). The plate (201) may be movably disposed in the first section (21) of the body (2) and may be configured to engage with tides at the on-shore location on one end when the vehicle (100) may be positioned at the on-shore location where the plurality of wheels (5) of the vehicle (100) may be in contact with ground and at least a portion of the first conversion unit (200) may be in contact with water or may be periodically in contact with water to engage with the tides. In such position of the vehicle (100), the plate (201) of the first conversion unit (200) is configured to displace based on engagement with the tides. In the illustrative embodiment, the plate (201) may be depicted as an elliptical shaped plate (201) to engage with the tides and the same shall not be considered a limitation. The plate (201) may be made of a composite material (including part of weightless material such as thermocol) such as but not limited to polymer matrix composites (PMCs), metal matrix composites (MMCs), ceramic matrix composites (CMCs), carbon matrix composites (CAMCs) and the like and the same shall not be considered a limitation. The first shaft (202) may be defined with a first portion (202a) and a second portion (202b) where the first portion (202a) may be defined with a plurality of teeth and the second portion (202b) of the first shaft (202) may be defined with a circular cross section. The second portion (202b) of the first shaft (202) defined with the circular cross section may be connected to the other end of the plate (201) opposite to the end being engaged with the tides, wherein the first shaft (202) may be displaced by the plate (201) due upon engaging with the tides. The plate (201) may be defined with a plurality of knuckle joints on the other end to connect to the first shaft (202). In an embodiment, the first shaft (202) may be displaced horizontally or at an inclination to ground at the on-shore location based on the height of the vehicle (100) from the ground.

Referring now to Figure 7, which illustrates an isometric view of the first conversion unit (200). The first shaft (202) of the first conversion unit (200) may be guided by the pulley (205) and the guide plate (204). The first portion (202a) of the first shaft (202) may engage with the first gear mechanism (501) and may extend beyond the first gear mechanism (501) upon engagement of the plate (201) with the tides.

Referring now to Figures 8a, 8b and 8c, which illustrate different positions of the first shaft (202) upon engagement of the plate (201) with the tides. The first shaft (202) may be at an initial position when the plate (201) may not be engaged with the tides as can be seen in Figure 8a where a substantial portion of the first portion (202a) of the first shaft (202) may be extending in front of the first gear mechanism (501). When the plate (201) may engage with the tides, the first shaft (202) may be displaced towards the first gear mechanism (501) and a portion of the first portion (202a) of the first shaft (202) may pass beyond the first gear mechanism (501) as can be seen in Figure 8b. Further, the tides may displace the first shaft (202) where substantial portion of the first shaft (202) may be extending beyond the first gear mechanism (501) as can be seen in Figure 8c. The first portion (202a) of the first shaft (202) may be retracted to the initial position by the retraction mechanism (203).

Referring now to Figure 1a and Figure 1e, the first section (21) of the body (2) may include an adjustable guide mechanism (4) to adjust horizontal position of the plate (201) relative to the body (2) of the vehicle (100) based on the on-shore location. The adjustable guide mechanism (4) may include a plurality of horizontal legs (41) extending from the body (2) to receive the first shaft (202) of the first conversion mechanism and a plurality of vertical legs (42) to be supported by the ground. The plurality of horizontal legs (41) may be defined with at least one linear bearing (206) to allow movement of the first shaft (202) based on the engagement of the plate (201) with the tides. In an embodiment, the first conversion unit (200) may comprise a retraction mechanism (203) connected between the adjustable guide mechanism (4) and the plate (201) to support and displace the plate (201) upon engaging with the tides. The retraction mechanism (203) may include a plurality of guide rods connected with a plurality of springs and a plurality of cylinders to retract the plate (201) upon engagement with the tides. One end of the plurality of guide rods and the plurality of cylinders may be connected to the another end of the plate (201) and an other end of the plurality of guide rods and the plurality of cylinders may be connected to the plurality of vertical legs (42) of the adjustable guide mechanism (4) as can be seen in Figure 1e. The tides may push back the plate (201) and the retraction

mechanism (203) may retract the plate (201) by pushing the plate (201) away from the plurality of vertical legs (42) of the retraction mechanism (203). In an embodiment, the plurality of cylinders may include hydraulic cylinders fluidly connected to a fluid pump and a fluid reservoir to retract the plate (201) and the same shall not be considered a limitation. In an embodiment, the control unit (3) may be communicatively coupled to the retraction mechanism (203) to selectively control the retraction mechanism (203) to expand and retract the plurality of cylinders to displace the plate (201) upon engagement with the tides. In an embodiment, the retraction mechanism may include a plurality of pressure sensors positioned proximal to the plurality of cylinders to sense pressure in at least one cylinder of the plurality of cylinders. The control unit (3) may receive a signal indicative of pressure in at least one cylinder of the plurality of cylinders and may transmit a control signal to the fluid pump to expand the plurality of cylinders and displace the plate (201) away from the plurality of vertical legs (42). The plurality of cylinders may be retracted by displacement of the plate (201) upon engaging with the tides. In an embodiment, the control unit (3) may transmit a control signal to the fluid pump to where the plurality of cylinders may be retracted to allow displacement of the plate (201) upon engagement with tides.

Referring now to Figure 1a and Figure 2, the second conversion unit (300) may be operable based on wind energy and may include a vertical axis wind turbine (301) mounted in the second section (22). The vertical axis wind turbine (301) may defined with a plurality of blades (303) connected to a second shaft (302), where the second shaft (302) may be rotated by the winds at the on-shore location as best seen in Figure 2. In an embodiment, the third conversion unit (400) may include at least one solar panel (401) mounted in at least one of the first section (21) and the second section (22). The power generated by the third conversion unit (400) may be directed to a plurality of lights of the vehicle (100).

Referring now to Figure 3 which depicts a generator unit (600) and a gear mechanism (500) being coupled to the second conversion unit (300). The gear mechanism (500) may be coupled to at least one of the first conversion unit (200) and the second conversion unit (300). The gear mechanism (500) may be configured to receive, convert and transmit motion from at least one of the first conversion unit (200) and the second conversion unit (300). In an embodiment, the gear mechanism (500) comprises a first gear mechanism (501) connected to the first conversion unit (200) and a second gear mechanism (502) connected to the second conversion unit (300).

The vehicle (100) may include a generator unit (600) coupled to the gear mechanism (500), and the generator unit (600) may be configured to generate power based on operation of the gear mechanism (500), from at least one of the first conversion unit (200) and the second conversion unit (300). In an embodiment, the generator unit (600) may include a first generator (601) connected to the first gear mechanism (501) and a second generator (602) connected to the second gear mechanism (502). The first gear mechanism (501) may be connected to the first generator (601) to generate power from motion transmitted by the first conversion unit (200) to the first gear mechanism (501). Similarly, the second gear mechanism (502) may be connected to the second generator (602) to generate power from the motion transmitted by the second conversion unit (300) to the second gear mechanism (502). In an embodiment, the generator unit (600) may transmit the power generated from the first conversion unit (200) and the second conversion unit (300) to a power grid and/or a battery to store the power generated from the first generator (601) and the second generator (602). In an embodiment, the power grid may be positioned along the shore of the ocean/sea and proximal to the on-shore location and the battery may be disposed on the body (2) of the vehicle (100) to store the power generated. In an embodiment, the generator unit (600) of the vehicle (100) may be electrically coupled to the power transmission wires of the power grid to transmit the power generated from the vehicle (100) to the power transmission wires.

Referring now to Figure 4 which is an isometric view of the first conversion unit (200) connected to the first gear mechanism (501) of the vehicle (100). The first shaft (202) of the first conversion unit (200) may be connected to the first gear mechanism (501), where the first shaft (202) may be configured to transmit displacement of the plate (201) to the first gear mechanism (501). The first gear mechanism (501) may include a first plurality of gears configured to engage with the plurality of teeth of the first portion (202a) of the first shaft (202) and may rotate based on movement of the first shaft (202) due to engagement of the plate (201) with the tides.

Referring now to Figure 5, the first plurality of gears may include four gears such as a first driving gear (501a), a second driving gear (501c), a first driven gear (501b) and a second driven gear (501d), where the first driving gear (501a) may be rotatably disposed on a gear support (501f), the first driven gear (501b) may be rotatably disposed on a first output shaft (501e) and the second driving gear (501c) and the second driven gear (501d) may be rotatably disposed on a lay shaft (501g). In an embodiment, the first output shaft (501e) may be configured to

rotate in a single direction, where the second driving gear (501c) may be selectively engaged and disengaged based on the direction of first shaft (202). The first plurality of gears may be connected to the first shaft (202) to convert the displacement of plate (201) of the first conversion unit (200) received by the first shaft (202) into rotation of the first output shaft (501e). The first output shaft (501e) of the first gear mechanism (501) may be connected to the first generator (601) to generate power based on the displacement of the first shaft (202) as can be seen in Figure 3.

Referring now to Figure 6, which illustrates an isometric view of a guide plate (204) and a pulley (205) of the vehicle (100). The first generator (601) may be mounted on a support portion (207) connected to the second floor (24) of the body (2) of the vehicle (100). The guide plate (204) may be extending vertically from the support portion (207) and may be defined with a slot (209) to guide the pulley (205) along the slot (209) to adjust the height of the plate (201) along based on the on-shore location to compensate for uneven elevations and depressions in sand at the on-shore location leading to unwanted inclination of the plate (201) with respect to the ocean/sea surface. In an embodiment, the slot (209) may be defined with a curved shape to guide the pulley (205). The guide plate (204) may include an opening (208) to allow the first output shaft (501e) of the first gear mechanism (501) and allow connection to the first generator (601) mounted on other side of the guide plate (204). The pulley (205) may be connected to one end of the first shaft (202) of the first conversion mechanism, where the first shaft (202) may be in contact with a guiding surface of the pulley (205) and the movement of the pulley (205) along the slot (209) may displace the first shaft (202) vertically to adjust the height of the plate (201) of the first conversion unit (200) based on the on-shore location.

Referring again to Figure 2, the vertical axis wind turbine (301) of the second conversion unit (300) may be connected to the second generator (602) of the generator unit (600). The second shaft (302) of the vertical axis wind turbine (301) may be connected to the second generator (602) configured to transmit rotation of the vertical axis wind turbine (301) to the second generator (602) and generate power from the wind energy. The shaft of the second generator (602) may extend and connected to the second gear mechanism (502) as can be seen in Figure 9a.

Referring now to Figure 9b which is an isometric view of a second plurality of gears of the second gear mechanism (502). The second gear mechanism (502) may include the second plurality of gears to receive rotation from the vertical axis wind turbine (301) through the second generator (602). The second plurality of gears may include a first bevel gear (502a) coupled to the second generator (602) and a second bevel gear (502b) coupled to an input shaft (501g) of the second gear mechanism (502) and meshing with the first bevel gear (502a). The second output shaft (502e) of the second gear mechanism (502) may be connected to the input shaft (502c) through a group of bevel gears (502d) as best seen in Figure 9b. In an embodiment, the second output shaft (502e) may be connected to a flywheel (502') for continuous power generation. The second output shaft (502e) of the second gear mechanism (502) may be connected to the first generator (601) where, the first generator (601) and the second generator (602) may be rotated at a speed whichever is highest between that of the first generator (601) and the second generator (602).

In an embodiment, the vehicle (100) may include one or more sensors [explicitly not shown in Figures] disposed proximal to the first gear mechanism (501) and the second gear mechanism (502) and the generator unit (600). The one or more sensors may transmit one or more signals corresponding to the power generated at the generator unit (600) by each of the first conversion unit (200), the second conversion unit (300) and the third conversion unit (400). The vehicle (100) may include a control unit (3) disposed on the body (2) of the vehicle (100) proximal to the control dashboard of the vehicle (100) in the first floor (23). The control unit (3) may be communicatively coupled to one or more sensors disposed proximal to the gear mechanism (500) and the generator unit (600) as can be seen in Figure 1e, the control unit (3) operatively coupled to the gear mechanism (500) and the generator unit (600). The control unit (3) may receive one or more signals corresponding to the power generated at the generator unit (600) by each of the first conversion unit (200), the second conversion unit (300) and the third conversion unit (400). Upon receiving the one or more signals from the one or more sensors, the control unit (3) may be configured to operate the gear mechanism (500) to regulate power generated at the generator unit (600) based on operation of the first conversion unit (200), the second conversion unit (300) and the third conversion unit (400) for continuous power generation, transmission and storage in the vehicle (100). In an embodiment, the control unit (3) may regulate at least one of the first gear mechanism (501) and the second gear mechanism (502) to allow continuous power generation, transmission and storage of power in the vehicle (100). The control unit (3) may be configured to selectively engage and disengage the first

output shaft (501e) of the first generator (601) from the second gear mechanism (502) when the speed of the first gear mechanism (501) may be less than the speed of the second gear mechanism (502) to generate power from the second gear mechanism (502) for continuous and maximum power generation in the vehicle (100). Thus, the control unit (3) may power generated from the first conversion unit (200) and the second conversion unit (300) where, the first generator (601) and the second generator (602) may be rotated at a speed whichever is highest between that of the first generator (601) and the second generator (602). Thus, the control unit (3) may maximize the power generated from the first generator (601) and the second generator (602) and may continuously generate power from the vehicle (100).

In an embodiment, the control unit (3) may be a centralised control unit (3) of the vehicle (100) or may be a dedicated control unit to the system associated with the centralised control unit of the vehicle. The control unit (3) may also be associated with other control units including, but not limited to, body control unit, engine control unit, transmission control unit, and the like.

The control unit (3) may be comprised of a processing unit. The processing unit may comprise at least one data processor for executing program components for executing user- or system-generated requests. The processing unit may be a specialized processing unit such as integrated system (bus) controllers, memory management control units, floating point units, graphics processing units, digital signal processing units, etc. The processing unit may include a microprocessor, such as AMD Athlon, Duron or Opteron, ARM's application, embedded or secure processors, IBM PowerPC, Intel's Core, Itanium, Xeon, Celeron or other line of processors, etc. The processing unit may be implemented using a mainframe, distributed processor, multi-core, parallel, grid, or other architectures. Some embodiments may utilize embedded technologies like application-specific integrated circuits (ASICs), digital signal processors (DSPs), Field Programmable Gate Arrays (FPGAs), etc.

The control unit (3) may be disposed in communication with one or more memory devices (e.g., RAM, ROM etc.) via a storage interface. The storage interface may connect to memory devices including, without limitation, memory drives, removable disc drives, etc., employing connection protocols such as serial advanced technology attachment (SATA), integrated drive electronics (IDE), IEEE-1394, universal serial bus (USB), fiber channel, small computing system interface (SCSI), etc. The memory drives may further include a drum, magnetic disc drive, magneto-optical drive, optical drive, redundant array of independent discs (RAID), solid-state memory devices, solid-state drives, etc.

EQUIVALENTS

With respect to the use of substantially any plural and/or singular terms herein, those having
5 skill in the art can translate from the plural to the singular and/or from the singular to the plural
as is appropriate to the context and/or application. The various singular/plural permutations
may be expressly set forth herein for sake of clarity.

It will be understood by those within the art that, in general, terms used herein, and especially
10 in the appended claims (e.g., bodies of the appended claims) are generally intended as “open”
terms (e.g., the term “including” should be interpreted as “including but not limited to,” the
term “having” should be interpreted as “having at least,” the term “includes” should be
interpreted as “includes but is not limited to,” etc.). It will be further understood by those
15 within the art that if a specific number of an introduced claim recitation is intended, such an
intent will be explicitly recited in the claim, and in the absence of such recitation no such intent
is present. For example, as an aid to understanding, the following appended claims may
contain usage of the introductory phrases “at least one” and “one or more” to introduce claim
recitations. However, the use of such phrases should not be construed to imply that the
20 introduction of a claim recitation by the indefinite articles “a” or “an” limits any particular
claim containing such introduced claim recitation to inventions containing only one such
recitation, even when the same claim includes the introductory phrases “one or more” or “at
least one” and indefinite articles such as “a” or “an” (e.g., “a” and/or “an” should typically be
interpreted to mean “at least one” or “one or more”); the same holds true for the use of definite
25 articles used to introduce claim recitations. In addition, even if a specific number of an
introduced claim recitation *is* explicitly recited, those skilled in the art will recognize that such
recitation should typically be interpreted to mean *at least* the recited number (e.g., the bare
recitation of “two recitations,” without other modifiers, typically means *at least* two recitations,
or *two or more* recitations). Furthermore, in those instances where a convention analogous to
30 “at least one of A, B, and C, etc.” is used, in general such a construction is intended in the sense
one having skill in the art would understand the convention (e.g., “a system (100) having at
least one of A, B, and C” would include but not be limited to systems that have A alone, B
alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C
together, etc.). In those instances where a convention analogous to “at least one of A, B, or C,
etc.” is used, in general such a construction is intended in the sense one having skill in the art
35 would understand the convention (e.g., “a system (100) having at least one of A, B, or C” would

include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase “A or B” will be understood to include the possibilities of “A” or “B” or “A and B.”

In addition, where features or aspects of the disclosure are described in terms of Markush groups, those skilled in the art will recognize that the disclosure is also thereby described in terms of any individual member or subgroup of members of the Markush group.

While various aspects and embodiments have been disclosed herein, other aspects and embodiments will be apparent to those skilled in the art. The various aspects and embodiments disclosed herein are for purposes of illustration and are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

Referral Numeral:

Component	Referral numeral
Vehicle	100
Frame	1
Body	2
First section	21
Second section	22
First floor	23
Second floor	24
Roof	25
First conversion unit	200
Plate	201
First shaft	202
Plurality of blades	303

First portion	202a
Second portion	202b
Retraction mechanism	203
Guide plate	204
Pulley	205
At least one linear bearing	206
Support portion	207
Opening	208
Slot	209
second conversion unit	300
Vertical axis wind turbine	301
Second shaft	302
Third conversion unit	400
Solar panel	401
Gear mechanism	500
First gear mechanism	501
First driving gear	501a
First driven gear	501b
Second driving gear	501c
Second driven gear	501d
Output shaft of the first gear mechanism	501e
Gear support	501f
Lay shaft	501g
Second gear mechanism	502
First bevel gear	502a
Second bevel gear	502b
Input shaft of the second gear mechanism	502c
Group of bevel gears	502d
Output shaft of the second gear mechanism	502e

Flywheel	502'
Generator unit	600
First generator	601
Second generator	602
Control unit	3
Adjustable guide mechanism	4
Plurality of horizontal legs	41
Plurality of vertical legs	42
Plurality of wheels	5
Hydraulic positioner	6
Base	61
First hydraulic cylinder	62
Second hydraulic cylinder	63
at least one stopper	64
Support column	65
Flange	66

We Claim:

1. A vehicle (100) for power generation, transmission and storage, the vehicle (100) comprising:

5 a frame (1);
 a body (2) coupled to the frame (1), the body (2) defining a plurality of sections being exposed to surroundings;

 a plurality of power conversion units, disposable on the body (2), the plurality of power conversion units comprising:

10 a first conversion unit (200) movably disposed in a first section (21) of the plurality of sections of the body;

 a second conversion unit (300) positioned in a second section (22) of the plurality of sections of the body; and

 a third conversion unit (400) positioned in at least one of the first section
15 (21) and the second section (22) of the plurality of sections of the body (2);

 a gear mechanism (500) coupled to at least one of the first conversion unit (200) and the second conversion unit (300), the gear mechanism (500) configured to receive, convert and transmit motion from at least one of the first conversion unit (200) and the second conversion unit (300);

20 a generator unit (600) coupled to the gear mechanism (500), the generator unit (600) configured to generate power based on operation of the gear mechanism (500), from at least one of the first conversion unit (200) and the second conversion unit (300); and

 a control unit (3) communicatively coupled to one or more sensors disposed
25 proximal to the gear mechanism (500) and the generator unit (600), the control unit (3) operatively coupled to the gear mechanism (500) and the generator unit (600), wherein the control unit (3) is configured to:

 receive one or more signals corresponding to the power generated at the generator unit (600) by each of the first conversion unit (200), the second
30 conversion unit (300) and the third conversion unit (400);

 operate the gear mechanism (500) to regulate power generated at the generator unit (600) based on operation of the first conversion unit (200), the second conversion unit (300) and the third conversion unit (400); and

regulate the power generated at the generator unit (600) to generate highest power generated from the first conversion unit (200), the second conversion unit (300) and the third conversion unit (400) for continuous power generation, transmission and storage in the vehicle (100).

5

2. The vehicle (100) as claimed in claim 1, wherein the gear mechanism (500) comprises a first gear mechanism (501) connected to the first conversion unit (200) and a second gear mechanism (502) connected to the second conversion unit (300), wherein the first gear mechanism (501) is connected to a first generator (601) of the generator unit (600) and the second gear mechanism (502) is connected to a second generator (602) of the generator unit (600).

10

3. The vehicle (100) as claimed in claim 2, wherein the first conversion unit (200) being operable based on wave energy, the first conversion unit (200) comprises:

15

a plate (201) movably disposed in the first section (21) of the body (2), the plate (201) configured to engage with tides at an on-shore location, wherein the plate (201) is configured to displace based on engagement with the tides; and

20

a first shaft (202) connected to the plate (201), the first shaft (202) being defined with a plurality of teeth and connected to the first gear mechanism (501), the first shaft (202) configured to transmit displacement of the plate (201) to the first gear mechanism (501).

25

4. The vehicle (100) as claimed in claim 3, wherein the first gear mechanism (501) comprises a first plurality of gears engaging with the first shaft (202), and wherein the first gear mechanism (501) is configured to convert displacement of the first shaft (202) to rotation motion for generation of power at the generator unit (600).

5. The vehicle (100) as claimed in claim 1, wherein the second conversion unit (300) being operable based on wind energy, the second conversion unit (300) comprises:

30

a vertical axis wind turbine (301) mounted in the second section (22) of the body (2), wherein the vertical axis wind turbine (301) is defined with a second shaft (302) connectable to the generator unit (600) and the second gear mechanism (502).

6. The vehicle (100) as claimed in claim 1, wherein the third conversion unit (400) being operable based on solar energy, the third conversion unit (400) comprises a solar panel (401) mounted in at least one of the first section (21) and the second section (22).

5 7. The vehicle (100) as claimed in claim 5, wherein the second gear mechanism (502) comprises a second plurality of gears connected to the second shaft (302) of the second conversion unit (300) and connected to a flywheel (502') on one end disposed on a second output shaft (502e) of the second gear mechanism (502).

10 8. The vehicle (100) as claimed in claim 2, wherein the generator unit (600) transmits the generated power from the first conversion unit (200) and the second conversion unit (300) to a power grid and/or a battery and wherein the first generator (601) and the second generator (602) are connected by the second gear mechanism (502).

15 9. The vehicle (100) as claimed in claim 3, comprises an adjustable guide mechanism (4) disposed in the first section (21) of the body (2) to adjust horizontal position of the plate (201) relative to the body (2) of the vehicle (100) based on the on-shore location and wherein the first conversion unit (200) comprises a retraction mechanism (203) connected between the adjustable guide mechanism (4) and the plate (201) to support
20 and displace the plate (201) upon engaging with the tides.

10. The vehicle (100) as claimed in claim 9, wherein the control unit is configured to selectively operate the retraction mechanism to displace the plate upon engagement with the tides.

25 11. The vehicle (100) as claimed in claim 1, wherein the first conversion unit (200) comprises:

a guide plate (204) defined with a slot (209) mounted on the first section (21) of the body (2); and

30 a pulley (205) slidably disposed in the slot (209) and connected to the first shaft (202) to assist in adjustment of height of the first shaft (202) and the plate (201).

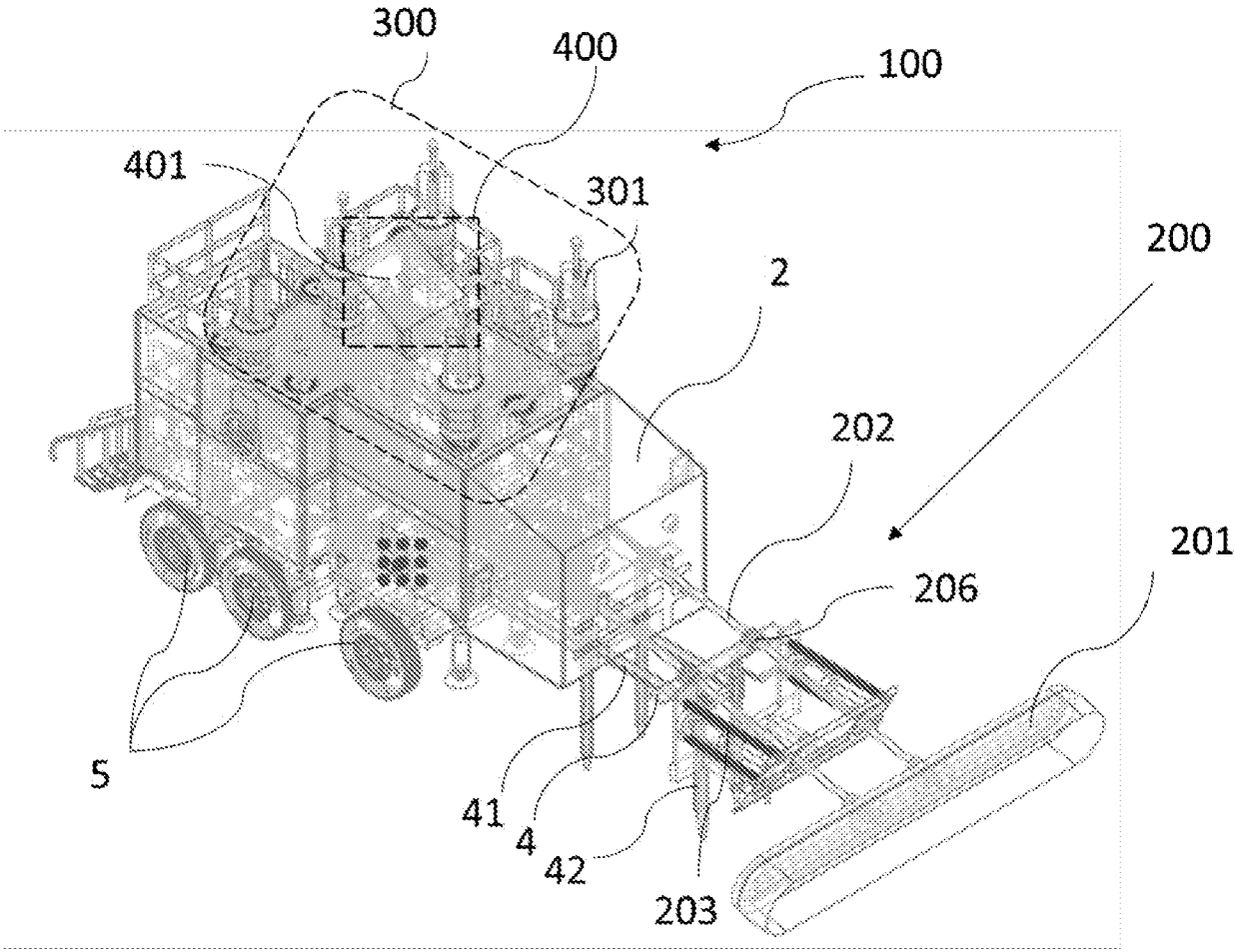


Figure 1a

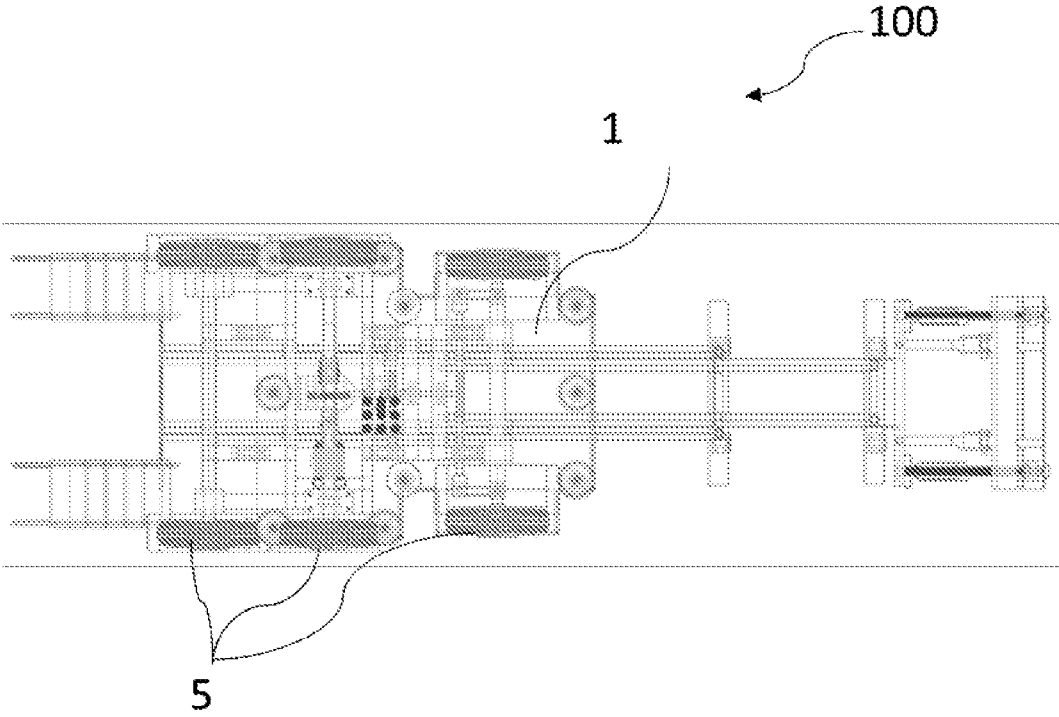


Figure 1b

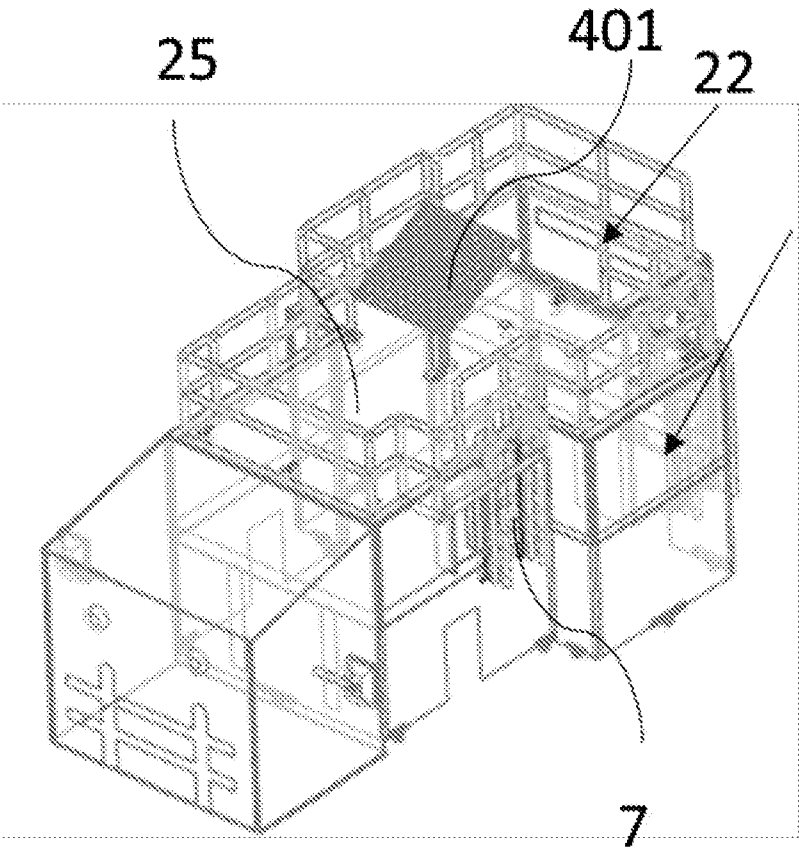


Figure 1c

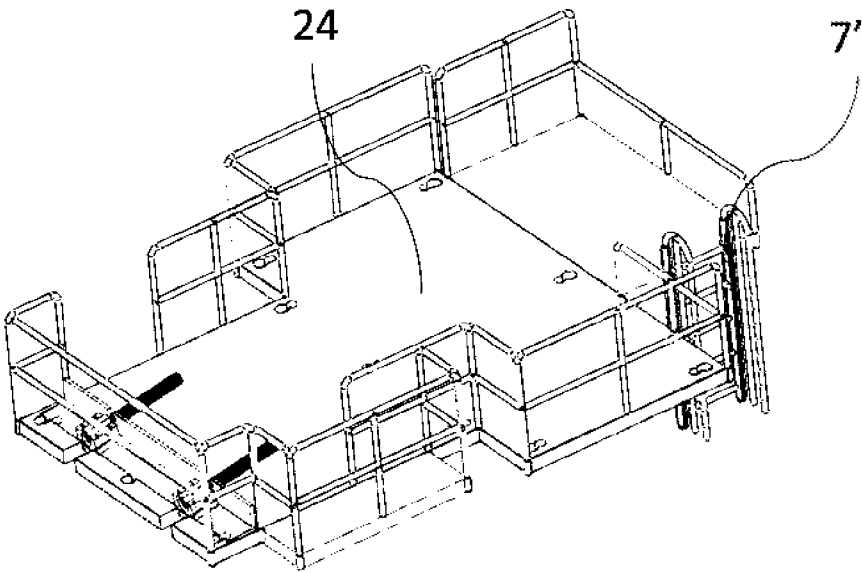


Figure 1d

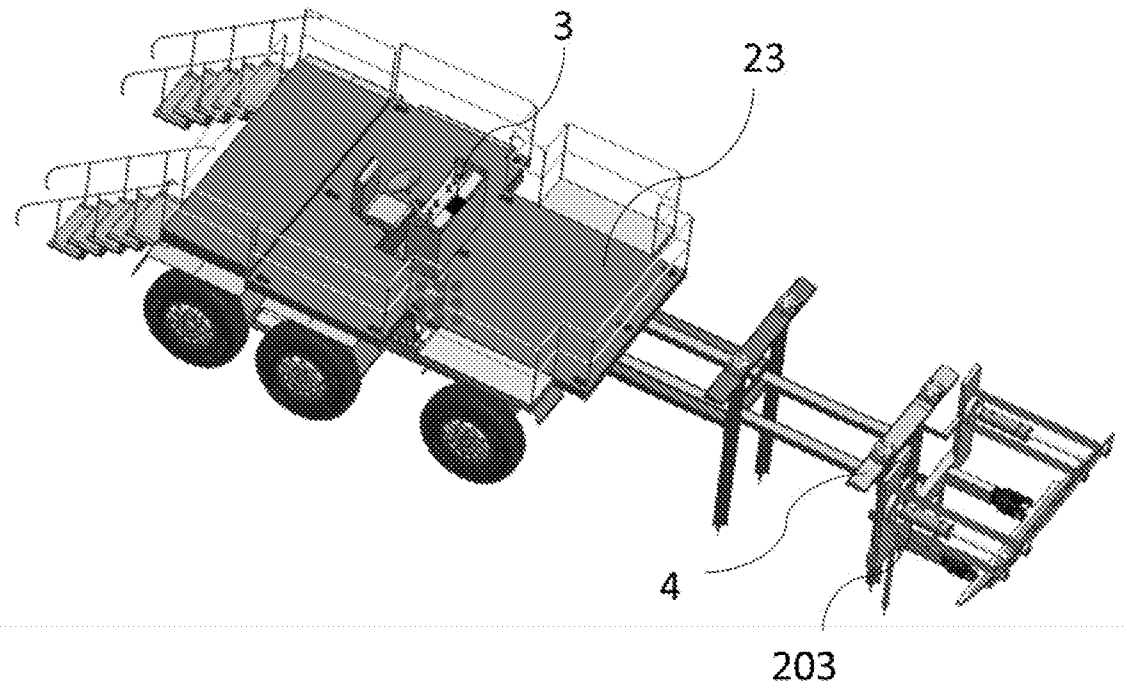


Figure 1e

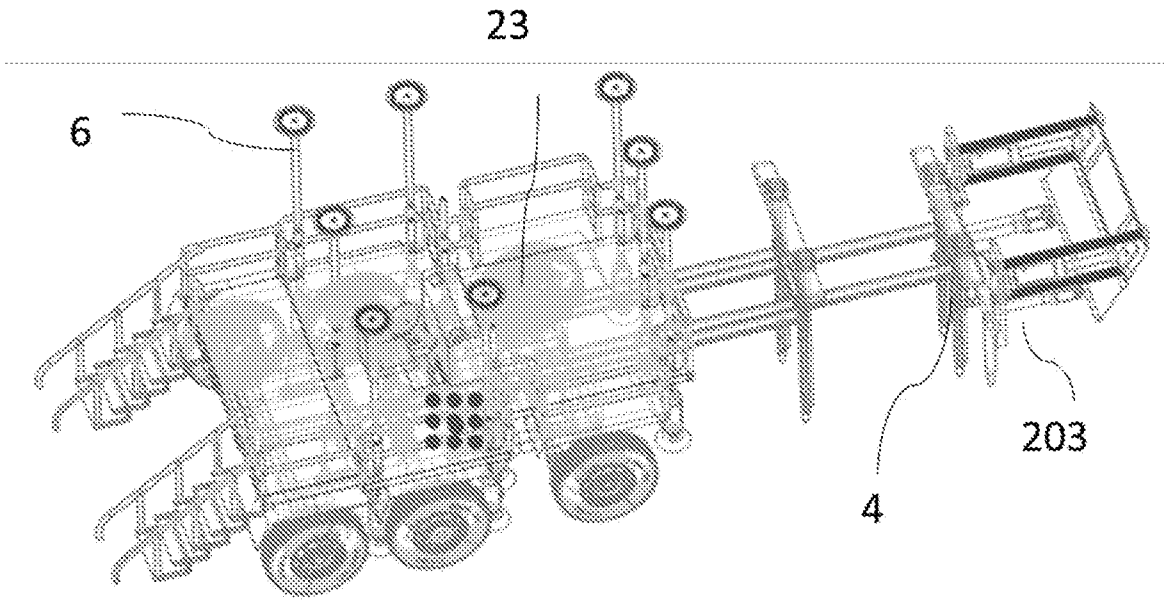


Figure 1f

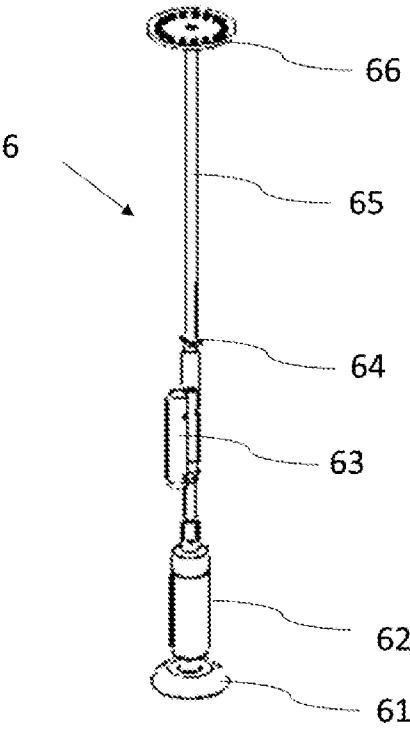


Figure 1g

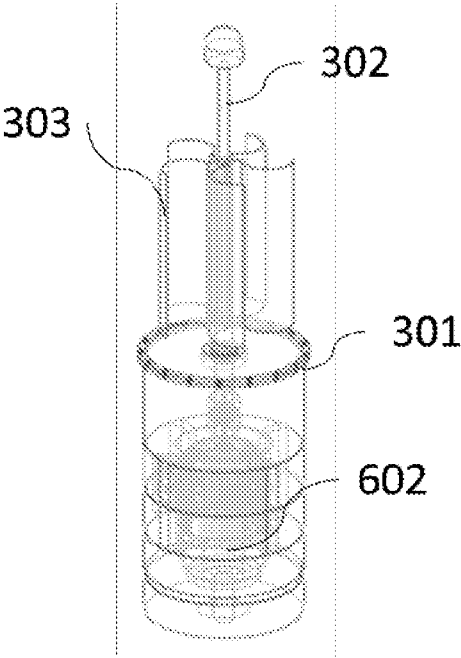


Figure 2

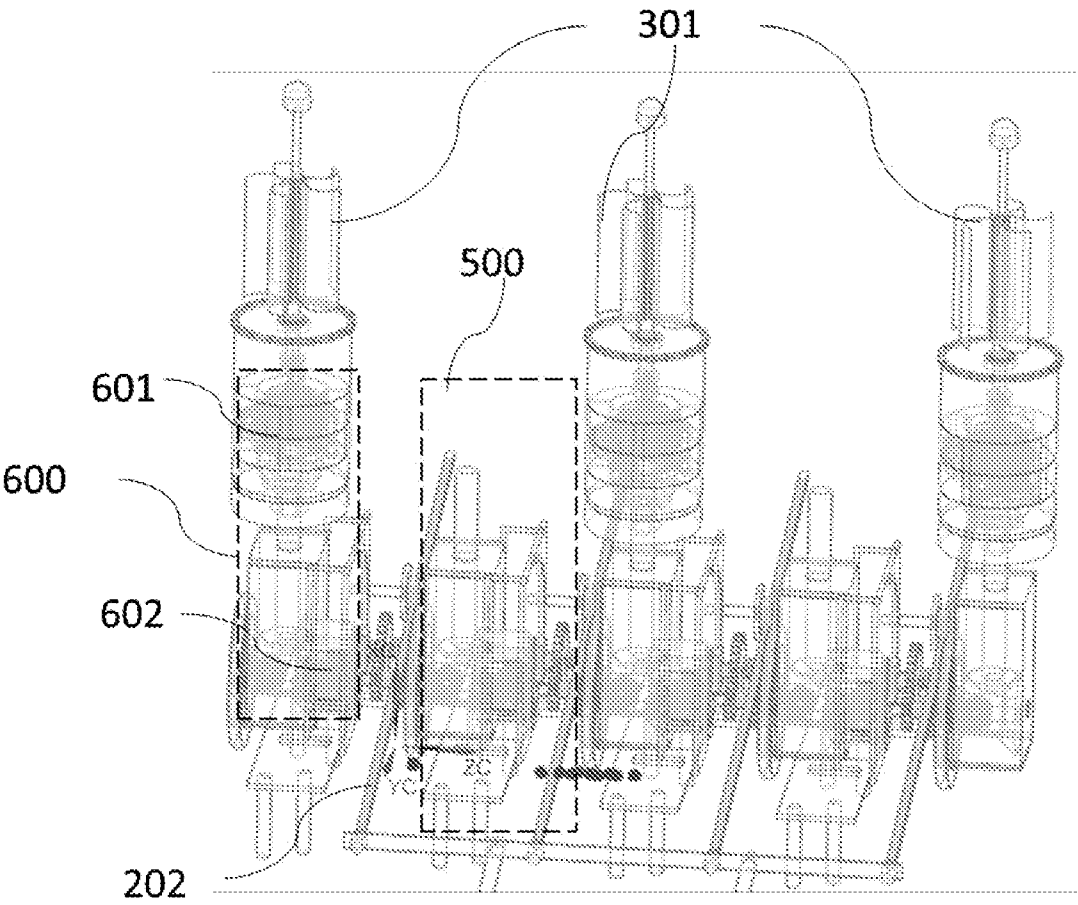


Figure 3

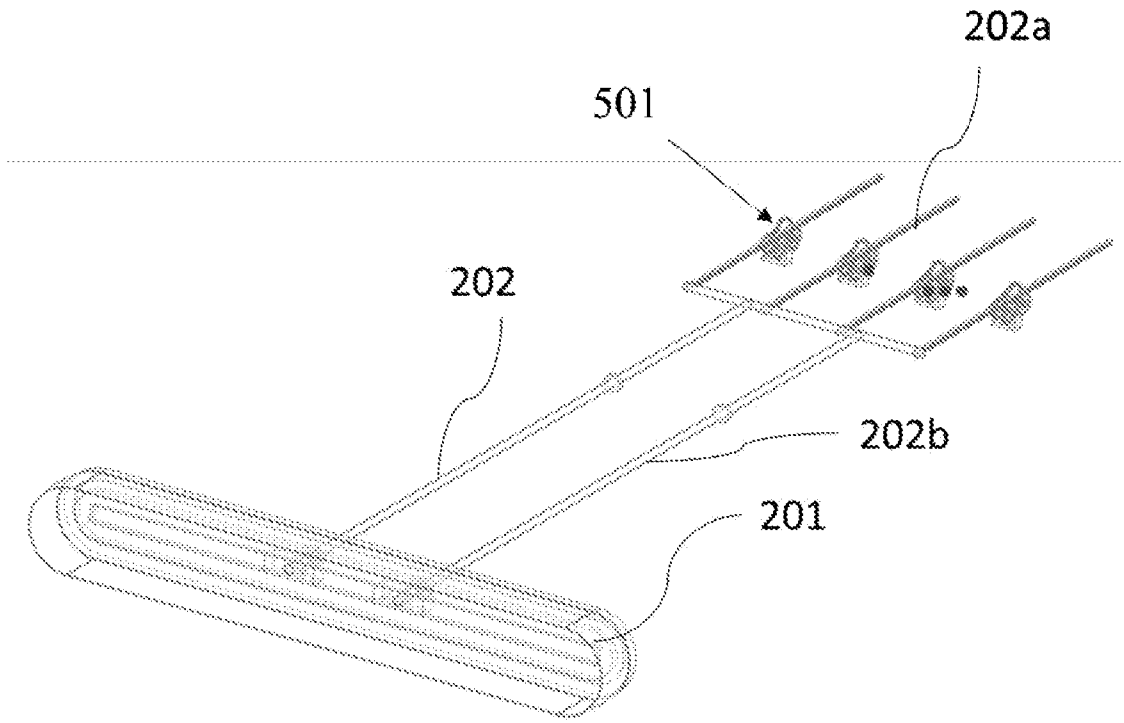


Figure 4

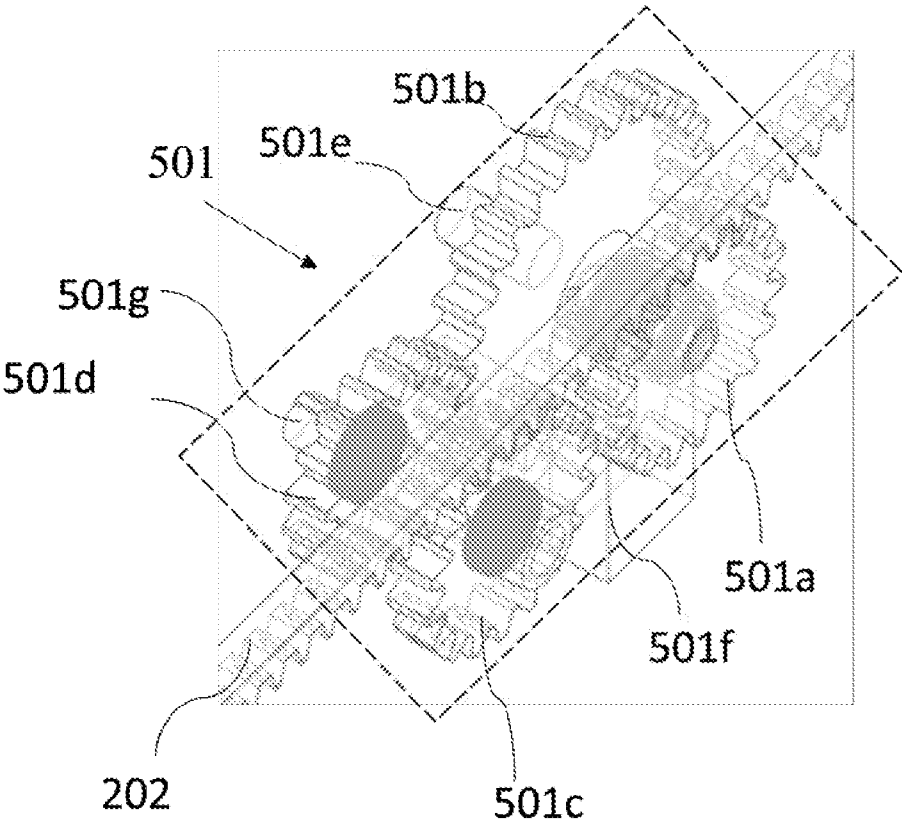


Figure 5

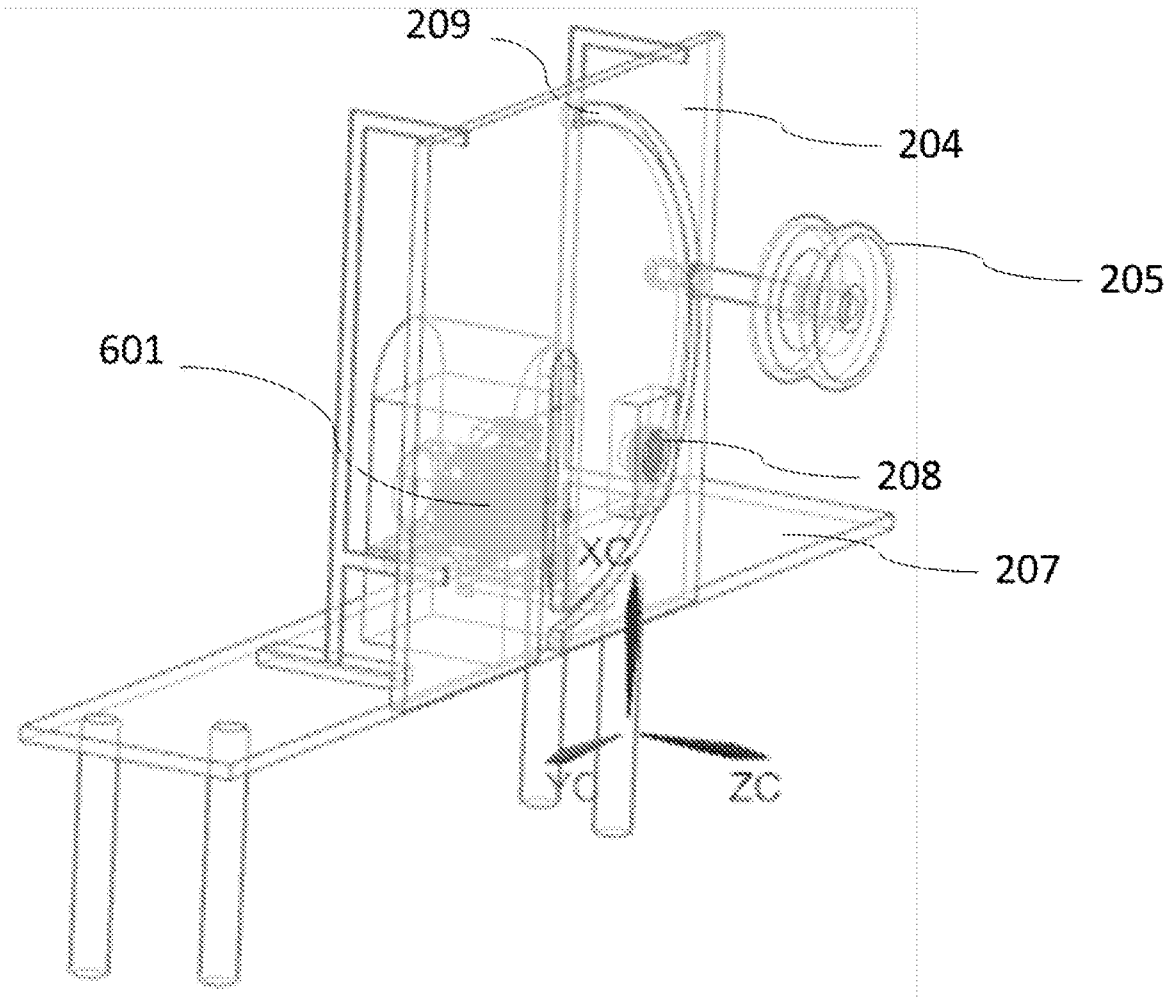


Figure 6

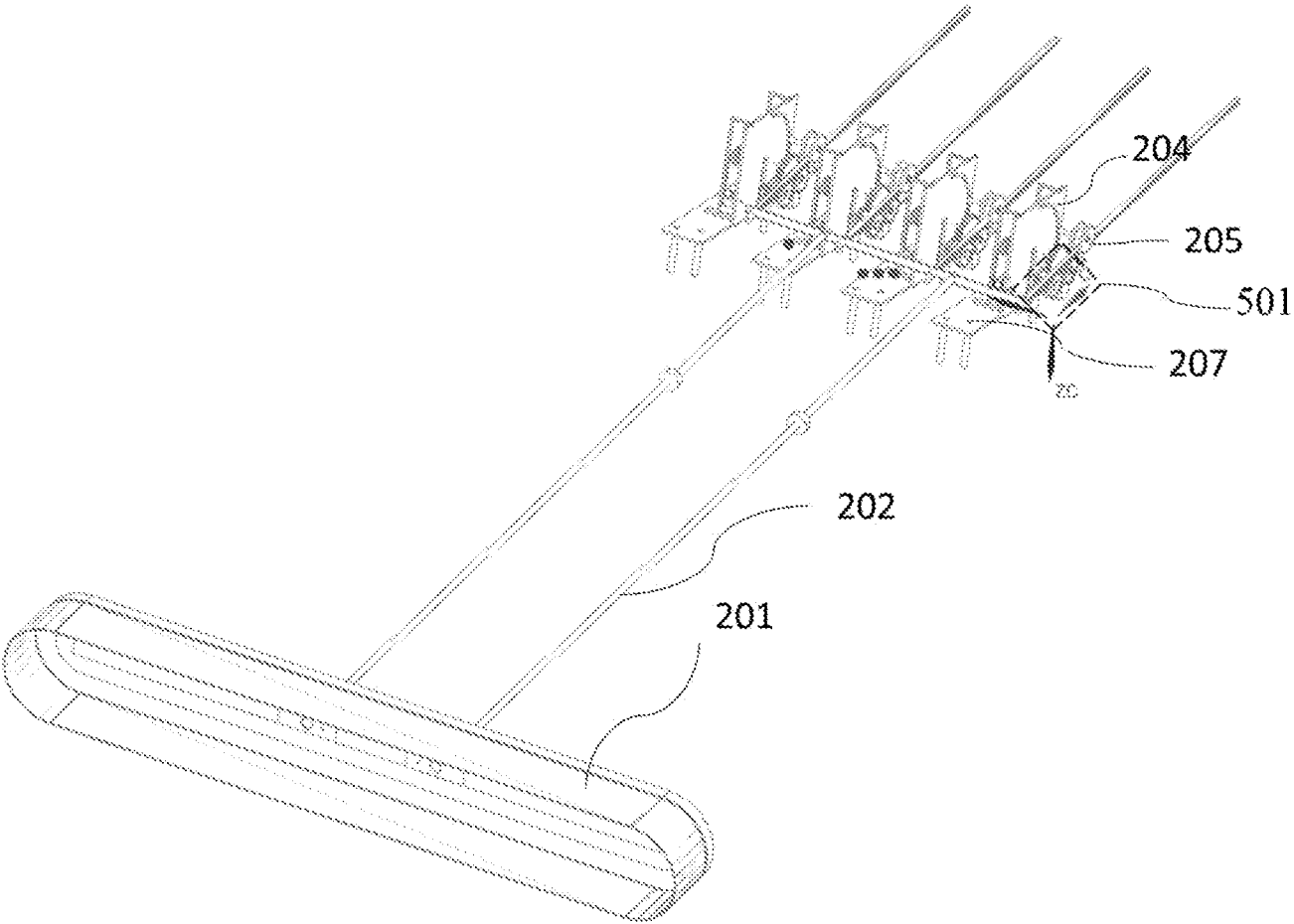


Figure 7

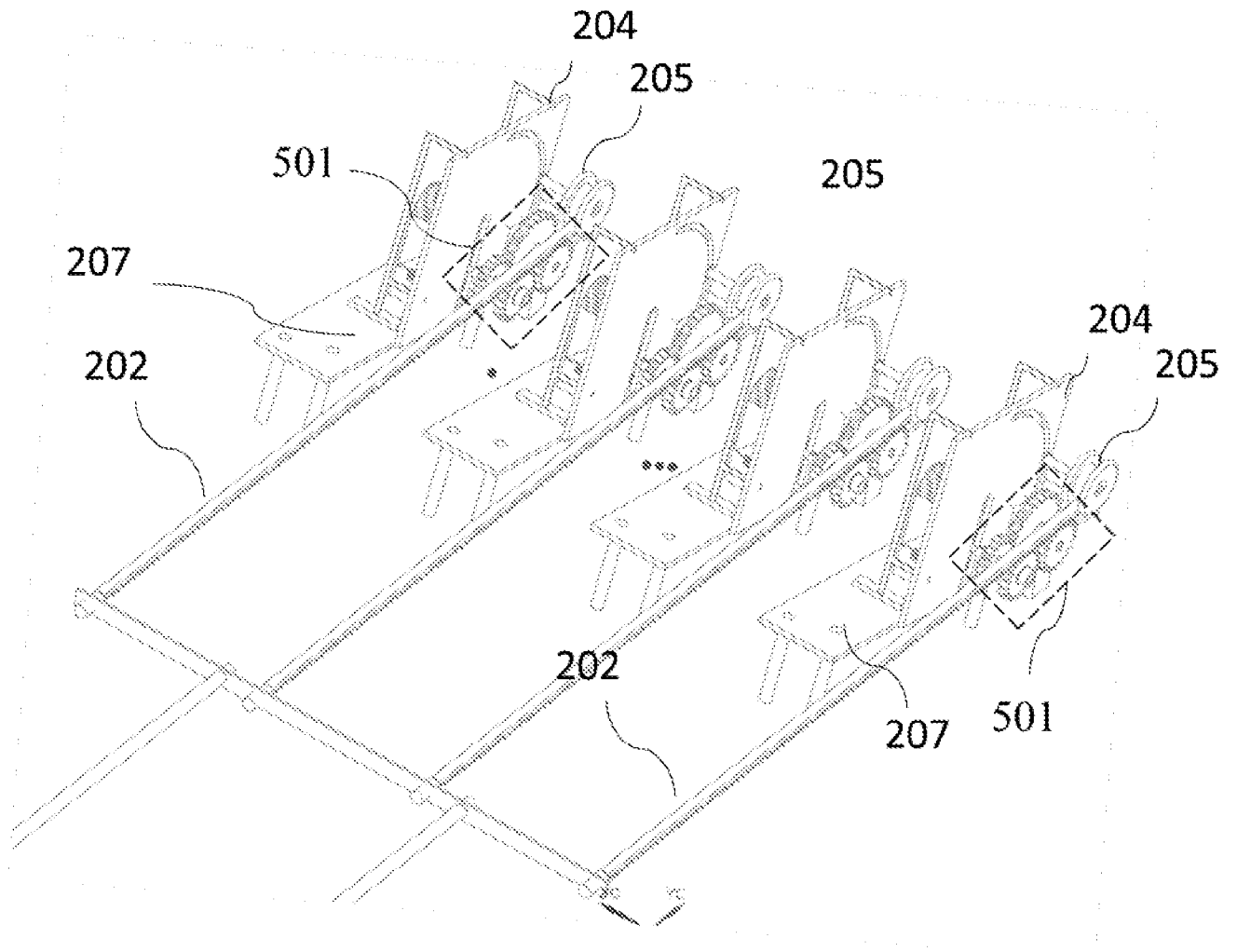


Figure 8a

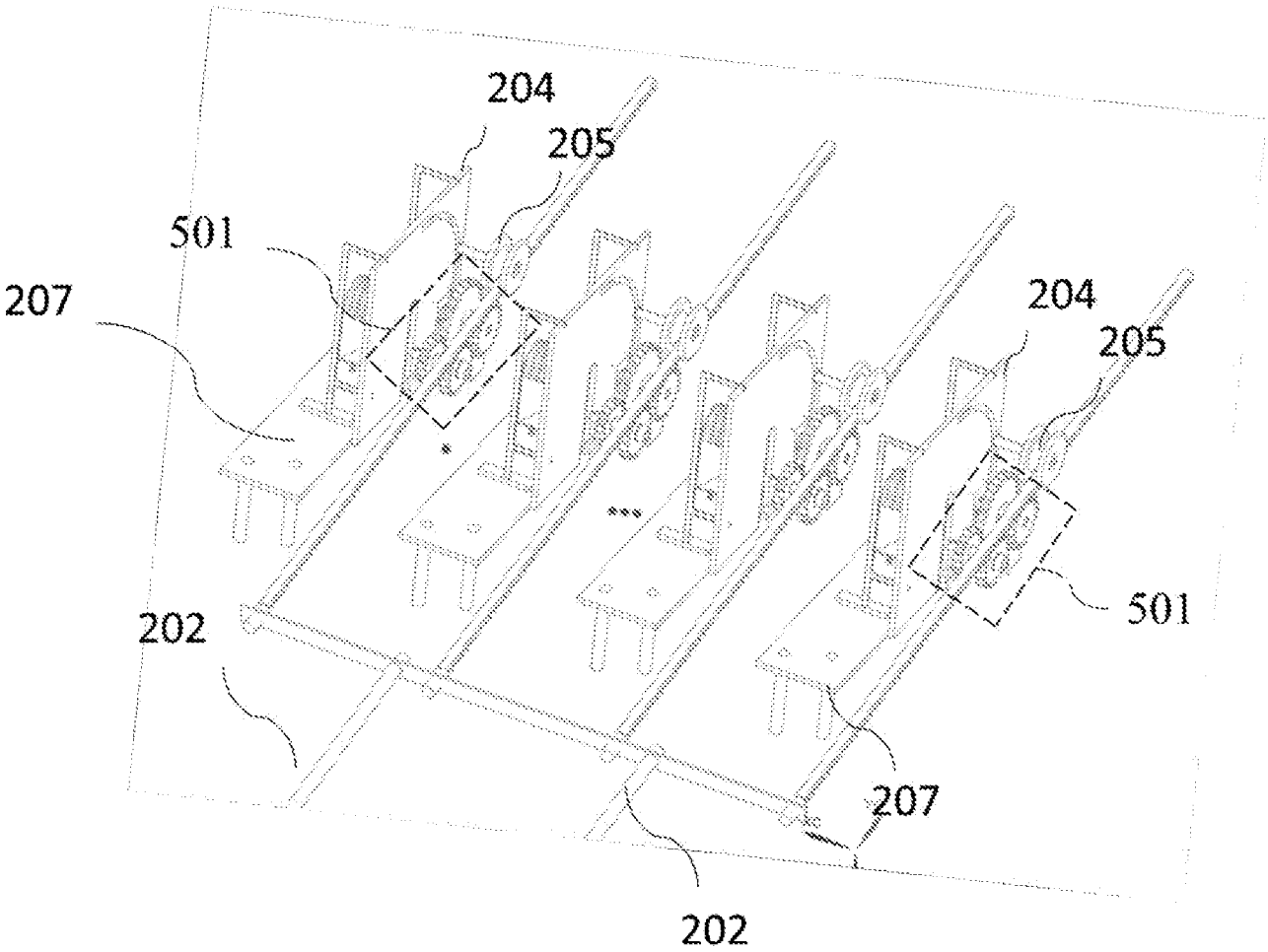


Figure 8b

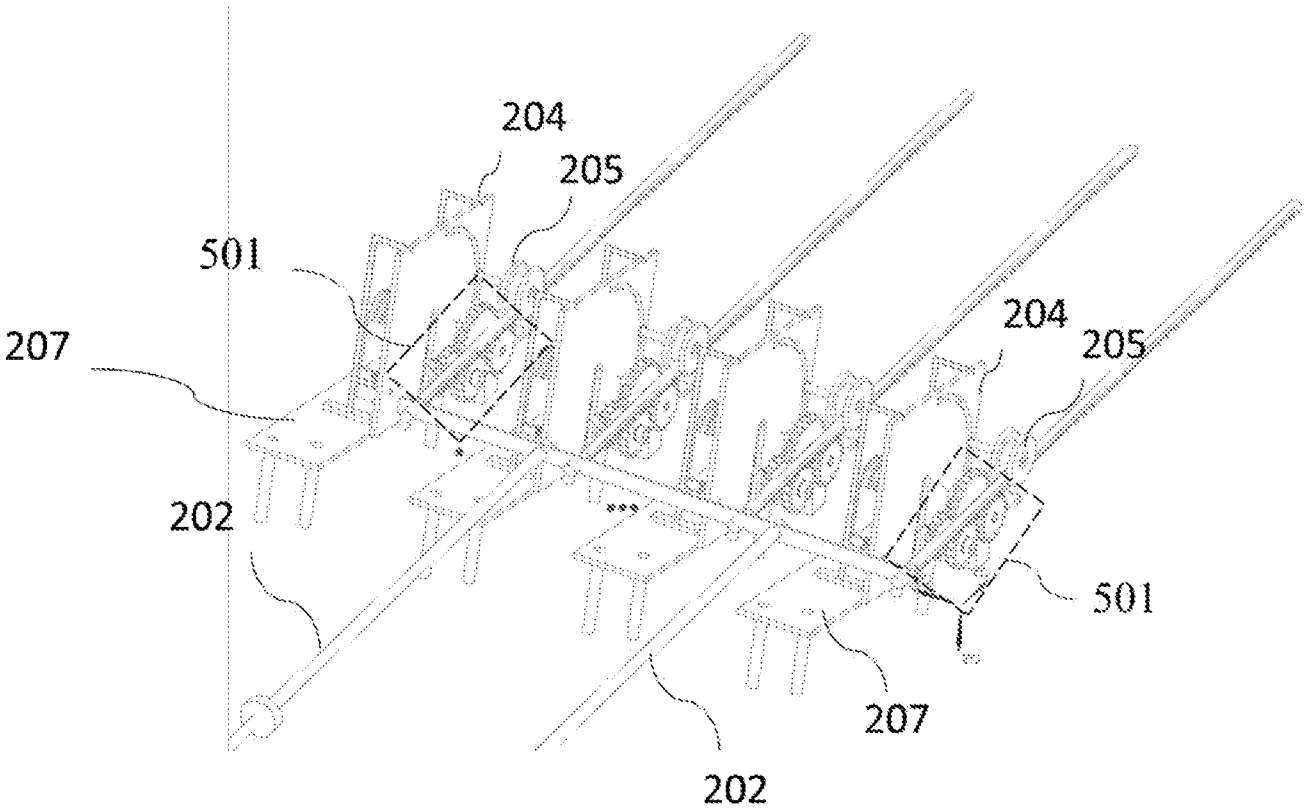


Figure 8c

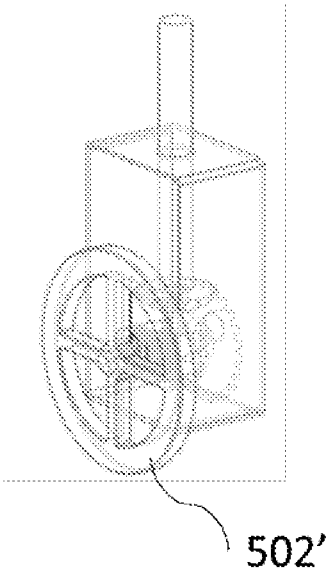


Figure 9a

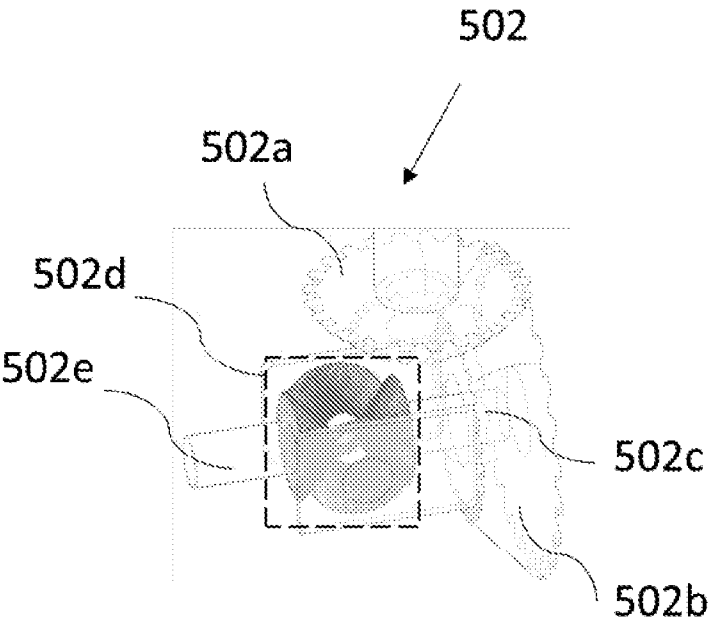


Figure 9b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN2024/050132

A. CLASSIFICATION OF SUBJECT MATTER
F03B13/14, F03D3/00, F03D9/30 Version=2024.01

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F03B, F03D

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

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

PatSeer, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO2006046843A1 (KIM YUN SE et. al. ; 04 May 2006) Abstract ; figures (as per English translation on Google Patents)	1-11

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

* Special categories of cited documents:

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

"D" document cited by the applicant in the international application

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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"I" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

26-03-2024

Date of mailing of the international search report

26-03-2024

Name and mailing address of the ISA/

Indian Patent Office
Plot No.32, Sector 14, Dwarka, New Delhi-110075
Facsimile No.

Authorized officer

Krishan Kumar

Telephone No. +91-1125300200

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/IN2024/050132

Citation	Pub.Date	Family	Pub.Date
WO 2006046843 A1	04-05-2006	KR 20050018764 A	28-02-2005