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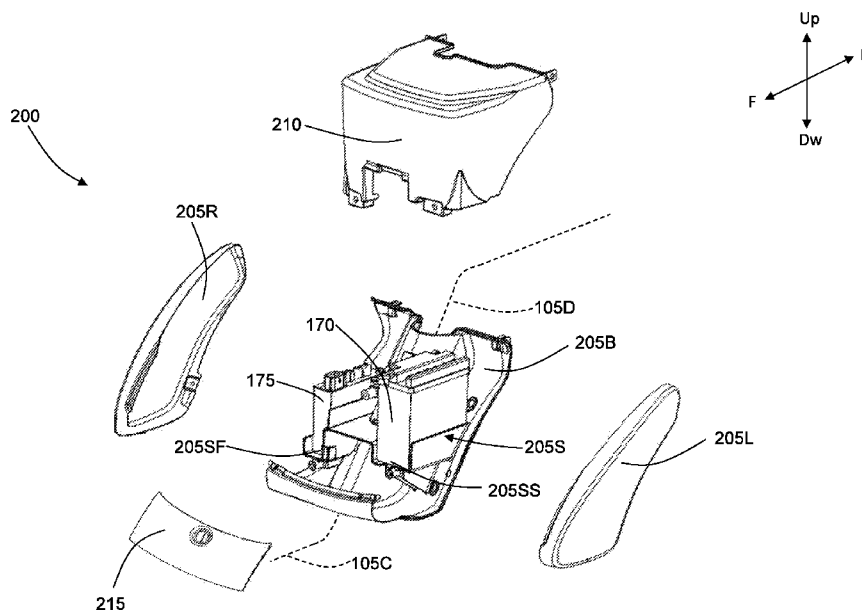


Fig. 2 (b)

(57) Abstract: The present subject matter provides a two-wheeled vehicle (100) with an auxiliary storage unit (200). The storage unit (200) is mounted to a rear tube (105D) of the frame assembly (105) disposed inclinedly. The auxiliary storage unit (200) includes a support member (205 S) capable of securely holding one or more electrical components (170, 175). At least one electrical component (175) of said one or more electrical components (170, 175) is disposed at a lateral off-set from a lateral center of the vehicle (100). Further, the one or more electrical components (170) excluding said at least one electrical component (175) are disposed in a first orientation with respect to the at least one electrical component (175). The auxiliary storage unit (200) provides a compact and secure storage space for the electrical components (170, 175).

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AN AUXILIARY STORAGE UNIT FOR A TWO-WHEELED VEHICLE

TECHNICAL FIELD

[0001] The present subject matter relates generally to a two-wheeled motor vehicle and more particularly to an auxiliary storage unit for two-wheeled motor vehicles.

BACKGROUND

5 [0002] Generally, in a two-wheeled saddle-ride type vehicle a frame assembly extends rearward from a head tube. Moreover, in the two-wheeled vehicle with a step-through type frame assembly, the frame assembly defines a step-through portion. The frame assembly acts as a skeleton for the vehicle that supports the vehicle loads. A front wheel and a rear wheel are connected to the frame
10 assembly through suspension system. Further, the vehicle is provided with a power unit mounted to the frame assembly of the vehicle and is capable of driving at least one of the front wheel and the rear wheel.

[0003] Generally, the vehicle is provided with a battery that is functionally coupled to the power unit. The battery is capable of driving the power unit or
15 enables driving of the power unit. For example, the battery is connected to a starter motor or the like to start a power unit comprising an internal combustion engine. In case of power unit including an electric drive motor, the electric drive motor is driven by the battery.

BRIEF DESCRIPTION OF THE DRAWINGS

20 [0004] The detailed description of the present subject matter is described with reference to the accompanying figures. Same numbers are used throughout the drawings to reference like features and components.

[0005] Fig. 1 (a) illustrates a left side view of an exemplary two-wheeled vehicle, in accordance with an embodiment of the present subject matter.

25 [0006] Fig. 1 (b) illustrates a left side view of a frame assembly of a vehicle, in accordance with an embodiment of the embodiment depicted in Fig. 1 (a).

[0007] Fig. 2 (a) illustrates a front perspective view of an auxiliary storage unit, in accordance with an embodiment of the present subject matter.

[0008] Fig. 2 (b) illustrates an exploded view of the auxiliary storage unit, in accordance with an embodiment depicted in Fig. 2 (a).

[0009] Fig. 2 (c) depicts a partial exploded view of the auxiliary storage unit, in accordance with the embodiment of Fig. 2 (b).

5 [0010] Fig. 2 (d) illustrates a left side perspective view of a base member employed on the frame assembly, in accordance with another embodiment of the present subject matter.

[0011] Fig. 2 (e) depicts a right side perspective view of a portion of the auxiliary storage unit and cross-sectional view taken along X-X thereof.

10 [0012] Fig. 2 (f) depicts another perspective view of a portion of the auxiliary storage unit employed with a controller case and a battery.

[0013] Fig. 3 (a) depicts a cross-sectional view of the auxiliary storage unit employed in the vehicle, in accordance with the embodiment depicted in Fig. 1.

15 [0014] Fig. 3 (b) depicts a top view of the auxiliary storage unit employed on the frame assembly.

[0015] Fig. 4 (a) depicts a front perspective view of the auxiliary storage unit, in accordance with another embodiment of the present subject matter.

[0016] Fig. 4 (b) depicts another view with parts exploded selectively, in accordance with the embodiment as depicted in Fig. 4 (a).

20 **DETAILED DESCRIPTION**

[0017] Generally, in a two-wheeled vehicle with a mono-tube frame assembly, a single tubular structure extends rearwardly from the head tube towards a floorboard defining a step-through portion of the vehicle. Further, various vehicle components that include the power unit, a fuel tank, and a seat
25 assembly are mounted to the frame assembly. Generally, such a vehicle has a naked appearance as it is conventionally called. In such vehicles, majority of the vehicle components are exposed to the atmosphere.

[0018] Especially, in vehicles with power unit including the engine assembly, the engine assembly includes a starter system. Vehicles, now a days,
30 are provided with electric start mechanisms for providing ease of starting. Also, vehicles are loaded with safety systems including an integrated starter generator

and/or an anti-lock braking system. The aforementioned systems are operated using the auxiliary power source and one or more control units. Therefore, the auxiliary power source and the control unit are crucial for functioning of the vehicle.

5 **[00019]** Often compact vehicle packaging and layout leads to shortage of space to package the auxiliary components of the vehicle like the battery, mobile charging unit, controller etc. Also many of such auxiliary components can be heavy and thus dis-proportionate disposition of such components across the vehicle layout can lead to poor mass centralization and affects the centre of gravity of the vehicle. This may cause riding discomfort and poor handling of the vehicle. Also, accessing of such auxiliary components for service becomes cumbersome owing to need to open body panels, other vehicle system and requires more time if these are disposed across different locations on the vehicle.

10 **[00020]** Components such as battery, mobile charge, and controller need to be adequately protected from mud, water, or other environmental factors to achieve good durability of the parts and longevity of the vehicle as a whole.

15 **[00021]** In case of vehicle employed with Integrated starter generator (ISG) or vehicles with electric traction motor, it becomes important to be able to provide adequate storage space for components like battery or controller that work with the ISG or electric traction motor and such heavy parts are to be disposed safely, and securely as well as providing ease of access for swapping, replacement/ repair or charging.

20 **[00022]** Parts like controller, canister or air filter also need to be placed in vicinity of the power train system to minimize wiring, cabling & connections required for the parts to functionally interface with each other.

25 **[00023]** In addition, to securely locate the aforementioned systems/components, the vehicle is to be provided with a storage space that is also used by the user for storing essential documents or tools. Moreover, such storage space is also to be secured from theft or the like.

30 **[00024]** Therefore, there is a need for securely mounting such components including the auxiliary power source and the control unit(s). The components are

to be accessible by only an authorized user. Also, the storage space provided is also to be accessible by authorized user. At the same time, the compact layout of the naked type of vehicle is to be retained. Thus, the present subject matter provides a two-wheeled vehicle with an auxiliary storage unit.

- 5 [00025] Hence, it is an object of the present subject matter to provide a two-wheeled vehicle employed with an auxiliary storage unit that addresses the aforementioned and other problems in the prior art.

[00026] It is an aspect of the present subject matter that the auxiliary storage unit is mounted to frame assembly. Specifically, the auxiliary storage unit is
10 mounted to a rear tube that is extending inclinedly rearward at a step-through portion. The auxiliary storage unit is disposed ahead of the down tube and major portion of the auxiliary storage unit is exposed by virtue of the naked type vehicle layout.

[00027] It is one more feature that the auxiliary storage unit is provided with
15 at least one electrical component disposed at lateral offset from lateral center of the vehicle. Preferably, the at least one electrical component is disposed adjacent to the rear tube. One or more electrical components excluding the at least one electrical component, disposed at lateral off-set, are disposed in one or more orientations with respect to the at least one electrical component.

20 [00028] It is another aspect that the auxiliary storage unit is disposed substantially below a rider seat thereby providing a compact vehicle layout without compromising on utility space of the vehicle. It is an advantage that the step-through space used for loading luggage is retained.

[00029] It is a feature of the present subject matter that the auxiliary storage
25 unit includes a support member capable of supporting one or more electrical components is mounted to a base member. It is an aspect that a long axis of the base member is along the rear tube, wherein the base member extends along the rear tube of the tube that supports it.

[00030] It is another feature that the support member is provided with one or
30 more stepped portions for securely holding electrical components of the vehicle. It is yet another feature that the one or more stepped portions are disposed

adjacent to the rear tube, which is substantially at the lateral center of the vehicle and the stepped portions are disposed at lateral off-set from the lateral center of the vehicle. Herein, the longitudinal axis of the vehicle is considered to be passing through lateral center of the vehicle. Therefore, the stepped portions are supported by the rear tube and extend adjacent to the rear tube providing a compact assembly.

[00031] The term "electrical components" used herein includes both electrical and electronic components. For brevity, the terms "electrical component" is used hereafter that includes both electrical and electronic or similar components. The aforementioned components include an auxiliary storage unit, a control unit, an anti-lock braking system, a mobile charging unit along with mobile storage, an on-board diagnostic unit, or any other similar electronic/electrical components.

[00032] It is an additional feature that the auxiliary storage unit is securely mounted to the frame assembly of the vehicle as the base member is mounted to inclined portion the rear tube.

[00033] It is additional feature that the auxiliary storage unit includes a storage space defined by the support member that enables user to store documents or tools. The storage space is defined by the support member, and at least a portion of a casing including the base member.

[00034] It is an advantage that the auxiliary storage unit provides aforementioned additional storage space that can be used for storing documents, tools etc. securely therein.

[00035] It is a feature of the present subject matter that the auxiliary storage unit is capable of accommodating an auxiliary power source like Lead-acid battery or an alternate power source like Li-ion battery without any major modifications. However, the auxiliary power source is not limited to the Lead-acid battery or Li-ion battery but also includes a fuel cell or the like.

[00036] It is additional feature that the auxiliary storage unit includes a primary cover member and a secondary cover member. The primary cover member covers at least a portion of the electrical components mounted to the support member thereby forming a layer of enclosure for securely covering them

and separating the electrical components from the additional storage space. In an embodiment, the primary cover member is detachably- attached to the support member. Moreover, the at least one electrical component disposed at off-set from lateral center enables provision of a compact primary cover member as the at
5 least one electrical component is disposed compactly.

[00037] It is another additional feature that the width of the auxiliary storage unit is substantially lesser than the width of the seat assembly in spite of accommodating electrical components like battery, thereby reducing the auxiliary storage to interfere with user riding posture or with other vehicle parts.

10 **[00038]** In an embodiment, the support member is made of non-conducting polymer or the like thereby eliminating the possibility of electrical components being short-circuited or the like.

[00039] In another embodiment, the support member is integrated with base member of the auxiliary storage unit, wherein the base member is part of the
15 casing and the support member securely supports the components.

[00040] It is another feature that the electrical components mounted to the auxiliary storage unit are accessible by detaching at least one of the primary cover member and the secondary cover member. Therefore, in some implementations, the components are accessible only after detaching the two
20 cover members for additional security.

[00041] In an embodiment, the primary cover member is detachable subsequent to detachment of the secondary cover member. It is an advantage that the auxiliary storage unit is provided with a single lock for accessing both the primary cover member and the secondary cover member.

25 **[00042]** It is yet an additional aspect that the secondary cover member is provided with a lock thereby eliminating unauthorized access to the electrical components. Further, tampering of electrical components of the vehicle is eliminated whereby functional reliability of the vehicle is improved.

[00043] It is another aspect that the support member provides spacing
30 between the electrical components thereby eliminating any electrical interference between the components.

[00044] It is a feature of the present subject matter that the auxiliary storage unit provides a compact and at the same time a secure storage space.

[00045] It is yet another feature that the auxiliary storage unit that is exposed provides compact vehicle packaging and compact as the auxiliary storage unit
5 does not require any additional packaging.

[00046] It is yet another feature that the heavy electrical components like the auxiliary power source are disposed so as to provide mass centralization and balancing center of gravity of the vehicle. It is an advantage that the auxiliary storage unit with the balancingly disposed components provides improved
10 ridability.

[00047] It is an additional feature that the auxiliary storage unit provides ease of service or replacement as the essential electrical components are all disposed within the auxiliary storage unit.

[00048] Further, the electrical components such as battery, mobile charger
15 along with mobile, or controller are adequately protected from mud, water, or other environmental factors thereby providing achieve good durability of the parts and longevity of the vehicle as a whole as the auxiliary storage unit selectively provides two lever protection by virtue of provision of primary cover member and the secondary cover member.

[00049] Further, the vehicles employed with the Integrated starter generator (ISG) or vehicles with electric traction motor, the electrical components working in conjunction with the aforementioned components are securely disposed in proximity thereof.

[00050] The aforesaid and other advantages of the present subject matter
25 would be described in greater detail in conjunction with the figures in the following description.

[00051] Fig. 1 (a) illustrates a left side view of an exemplary two-wheeled vehicle, in accordance with an embodiment of present subject matter. Fig. 1 (b) depicts the frame assembly of the vehicle depicted in Fig. 1 (a). The vehicle 100
30 has a frame assembly 105, which acts as the structural member and skeleton. The frame assembly 105 includes a head tube 105A through which a steering

assembly is journaled. The steering assembly includes a handle bar assembly 110 connected to a front wheel assembly 115 through one or more front suspension(s) 120. A front fender 125 covers at least a portion of the front wheel 120. Further, the frame assembly 105 includes a main tube 105B extending rearwardly
5 downward from the head tube 105A. A fuel tank assembly 130 is mounted to the main tube 105B. Furthermore, a floor tube 105C extends substantially horizontally rearward from a rear portion of the main tube 105B. In addition, the frame assembly includes one or more rear tube(s) 105D that extends inclinedly rearward from a rear portion of the floor tube 105C. The main tube 105B extends
10 rearwardly downward from the head tube 105A. In a preferred embodiment, the frame assembly 105 is a mono-tube type, which extends from a front portion F to a rear portion R of the vehicle 100.

[00052] The power unit 135 is mounted to the floor tube 105C. In an embodiment, the power unit 135 includes an IC engine. The fuel tank 130 is
15 functionally connected to the power unit 135. In a preferred embodiment, engine is forwardly inclined i.e. a piston axis of the engine is forwardly inclined. The power unit 135 is functionally coupled to a rear wheel. A swing arm 140 is swingably connected to the frame assembly 105. A rear wheel assembly 145 is rotatably supported by the swing arm assembly 140. One or more rear
20 suspension(s) 150, which are connecting the swing arm 140 at a first angle, to sustain both the radial and axial forces occurring due to wheel reaction, to the frame assembly 105. A rear fender 155 is disposed above the rear wheel 145. A seat assembly 160A, 160B is disposed at a rear portion R of the step-through portion. In an embodiment, the seat assembly 160 includes a rider seat 160A, and
25 a pillion seat 160B. Further, the seat assembly 160A, 160B is positioned above the rear wheel 145. The vehicle 100 is supported by a center stand mounted to the frame assembly 105. A floorboard 165 is mounted to the floor tube 105C and is disposed at the step-through portion. The floorboard 165 covers at least a portion of the power unit 135. The vehicle 100 is employed with an auxiliary storage unit
30 200 mounted to the frame assembly 105 and is disposed below the rider seat

160A. Also, the vehicle 100 is provided with at least one set of foot rest(s) 180 for the rider/pillion to rest their feet.

[00053] The internal combustion (IC) engine of the power unit 135 includes an, an air intake system (not shown), an exhaust system (not shown), and a starter
5 system (not shown). The starter system includes an electric starter mechanism or a mechanical starter mechanism. The electrical starter system is powered by an auxiliary power source, for cranking the IC engine. Power generated by IC engine is transferred to the rear wheel 145 through a transmission system (not shown).

[00054] Fig. 2 (a) illustrates a front perspective view of an auxiliary storage
10 unit, in accordance with an embodiment of the present subject matter. The auxiliary storage unit 200 is mounted to the frame assembly 105 (as shown in Fig. 1 (b)). The auxiliary storage unit 200, hereafter intractably used as a storage unit, comprises of a casing 205 with a primary cover member 210 and a secondary cover member 215. Further, a lock 220 is provided to securely lock the
15 primary cover member 210 and the secondary cover member 215.

[00055] Fig. 2 (b) illustrates an exploded view of the auxiliary storage compartment, in accordance with an embodiment depicted in Fig. 2 (a). In the present embodiment, the casing 205 includes a base member 205B, a right wall member 205R, and a left wall member 205L that provide a partially enclosed
20 space. In the present embodiment, the right wall 205R and the left wall member 205L are affixed to the base member 205B. In one embodiment, the base member 205B, the right wall member 205R, and the left wall member 205L are integrally formed. The base member 205B is provided with a support member 205S that is capable of securely supporting at least one of an auxiliary power source 170 and a
25 control unit 175. In one embodiment, the auxiliary power source 170 is provided with length around 130 millimeters, height around 130 millimeters, and height around 60 millimeters. In the present embodiment, the auxiliary power source 170 is a Lead-acid battery or a Lithium-ion battery. The support member 205S is affixed to the base member 205B. In an embodiment, the support member 205S is
30 made of electrically non-conducting material preferably any polymer. Further, the

casing 205 is made of a rigid material including any known metal, polymer, or the like.

[00056] Further, the primary cover member 210 is having a semi-cuboid structure mounted to the base member 205B. In the depicted implementation, the
5 semi-cuboid structure is having four faces/sides with the sides disposed laterally are having lower portion that matches with the profile of the base member 205B. The primary cover member 210 and the base member 205B form a closed structure enclosing the battery 170 and the controller 175. The battery 170 acts as an auxiliary power source. Moreover, in the present implementation, the battery
10 170 is a Lead-acid battery. In the present embodiment, the primary cover member 210 is covering the auxiliary power source 170 and the controller 175 from two or more sides. Therefore, the controller 175 that works in conjunction with the power unit and with the auxiliary power source 170 are disposed in proximity to one another and are compactly secured in the auxiliary storage unit 200. The
15 primary cover member 210 is secured to the casing 205 in a detachably-attached manner. Moreover, the primary cover member 210 is secured to the casing 205 by using the fasteners. The secondary cover member 215 is secured to the casing 205 by lock 220 provided on the secondary cover member 215. The lock 220 in an engaging position abuts against at least apportion of the casing 205 thereby
20 securing secondary cover member 215 to the casing 205.

[00057] Moreover, the support member 205S provided in the casing 205 defines a storage space S. The storage space S is accessible by removing the secondary cover member 215. Fig. 2 (c) depicts the storage space S defined by the support member 205S in the casing 205. Specifically, the storage space S is
25 defined by the right wall member 205R, the left wall member 205L, the base member 205B, and the support member 205S. The secondary cover member 215 provides access to the storage space S. Further, the primary cover member 210 is detachable only after removing the secondary cover member 215. An authorized user with an authorized key can only access the storage space S, the battery 170
30 and the control unit 175. Thus, the auxiliary storage unit 200 provides a secure storage space S and also the battery 170 or the control unit 175 are accessible

only after removing the secondary cover member 215 and subsequent removal of the primary cover member 210.

[00058] Further, in the present embodiment, the primary cover member 210 is provided with one or more apertures 210A, 210B that enable in fastening the primary cover member 210 to the base structure 205B or the support member 205S. In the depicted implementation, the apertures 210A, 210B are provided on the front facing side and at a lower portion of the front facing side. Therefore, the fasteners provided at the aperture 210A, 210B are visible and are accessible after removal of the secondary cover member 215. In one embodiment, the base structure 205B is integrally formed with the support member 205S. Further, the primary cover member 210 can be snap-fitted to the base structure 205B in addition to the fasteners.

[00059] Fig. 2 (d) depicts a left side perspective view of the base structure 205B of the auxiliary storage unit 200 mounted to the frame assembly 105, in accordance with the embodiment as depicted in Fig. 2 (b). The base member 205B is disposed substantially along the inclined portion of the rear tube 105D. A front portion of the base member 205B is in proximity to the floorboard 165 and a rear portion of the base member 205B is in proximity to the rider seat 160A. A mid-portion 205BM of the base member 205B is provided with a curved cross section that extends along a long axis of the base member 205B. The mid-portion 205BM annularly encloses at least a portion of the rear tube 105D and the mid-portion is having a contour substantially conforming the rear tube 105D. Further, the support member 205S is mounted to the upper facing surface of the base member 205B. Further, at least one electrical component is the controller 175 disposed at lateral offset from the lateral center of the vehicle 100. The auxiliary storage unit further enables storage of another electrical component, which is the battery 170 disposed in a first orientation with respect to the controller 175.

[00060] The support member 205S extends substantially horizontally to enable mounting of the battery 170 and the control unit 175. Therefore, the battery 170 is disposed parallel to the control unit 175, wherein the first orientation is a parallel

to the controller 175. A first line B-B' passing parallel to the long axis of the base member 205B is at a first angle with a second line S-S' passing along the long axis of the support member 205S. The first angle is an acute angle in the range of 25-75 degrees. The first angle in the specified range enables the auxiliary storage unit 200 to have a compact layout thereby enabling compact assembly. Also, the first angle is chosen to be preferably matching with the inclination of the rear tube 105D. The first line B-B' is considered as the long axis B-B' of the base member 205B. Also, the support member 205S is provided with at least one step-portion disposed at a lateral off-set from a longitudinal axis F-R of the vehicle 100 in order to accommodate at least one electrical component deposited thereof.

[00061] In the present implementation, a first step portion 205SF and a second step portion 205SS that are disposed on either lateral sides of the mid-portion 205BM of the base member 205B. Furthermore, the first step portion 205SF and the second step portion 205SS extend adjacently of the rear tubes 105D. The step portions 205SF, 205SS of the support member 205S is provided with one or more ribs 205RR that are disposed vertically connecting the bottom portion of the support member 205S to the base member 205B thereby providing structural strength to the support member 205S to support the electrical components 170, 175. The first step portion 205SF and the second step portion 205SS define a shell with at least one opening for receiving the electrical components 170, 175, wherein in the present implementation the shell is having an upward and a forward opening to receive the electrical components 170, 175. Further, the shell is adapted to have a cross-section complementing shape of the electrical components 170, 175. In other words, in a side view, the rear tubes 105D of the frame assembly 105 overlaps with at least a portion of the first step portion 205SF and the second step portion 205SS. This provides a compact layout for mounting the battery 170 and the control unit 175.

[00062] Fig. 2 (e) depicts a right side perspective view of a portion of the auxiliary storage unit 200 and cross-sectional view taken along X-X' thereof. Fig. 2 (f) depicts another perspective view of a portion of the auxiliary storage unit

200 employed with a controller case 175C and a battery 170. The base structure 205B is provided with one or more apertures 220A, 220B, 220C, 220D, and 220E that are provided on either sides of the mid-portion 205BM of the base structure 205B. The base member 205B of the auxiliary storage unit 200 is mounted to the rear tube(s) 105D (shown in Fig. 2 (d)) using one or more bracket(s) (not shown) extending in the vehicle width direction RH-LH for securing the auxiliary storage unit 200 to the frame assembly 105.

[00063] Further, in an embodiment, the auxiliary storage unit 200 is provided with a controller-casing 175C for accommodating the control unit 175. The controller-casing 175C is preferably made of non-conducting material to isolate the control unit 175 from electrical shorts. Moreover, the controller-casing 175C is provided with plurality of fins or heat sinks to enable heat dissipation from the control unit 175. The controller-casing 175C is affixed to the support member 205S at the first step portion 205SF. The battery 170 is mounted to the second step portion 205SS and in a detachable manner. The battery 170 is secured to the base member 205B using an elastic strap or the like.

[00064] Fig. 3 (a) depicts a cross-sectional view of the auxiliary storage unit employed in the vehicle, in accordance with the embodiment depicted in Fig.1. The cross-section is taken along a horizontal plane with respect to the vehicle 100. The auxiliary storage unit 200 securely encloses the battery 170 and the control unit 175. In the top view, the control unit 175, the battery 170, and the rear tube 105D are adjacently disposed. Further, the battery 170 and the control unit 175 are disposed substantially parallel to the longitudinal axis F-R of the vehicle 100. The longitudinal axis F-R is considered to be substantially at a lateral center of the vehicle 100. However, in another embodiment, at least one of the battery 170 and the control unit 175 are inclinedly disposed with respect to the longitudinal axis F-R of the vehicle 100 to accommodate length of the electrical components.

[00065] Fig. 3 (b) depicts a top view of the auxiliary storage unit employed with the frame assembly 105. In the top view, the width of the auxiliary storage unit W1 is substantially lesser than the width of the seat assembly 160 (shown in

Fig. 1), which includes the rider seat 160A and the pillion seat 160B. Also, in one embodiment, gap between the inward facing sides of the foot rests 180 is represented as W3, which is greater than the width of the auxiliary storage unit W1. Especially, the width of the auxiliary storage unit W1 is lesser than the width of the seat assembly W3, thereby keeping the vehicle layout compact. Therefore, the width of the auxiliary storage unit W1 is within the width of the vehicle 100 thereby retaining the compact layout of naked type vehicles.

[00066] Fig. 4 (a) depicts a front perspective view of an auxiliary storage unit, in accordance with another embodiment of the present subject matter. Fig. 4 (b) depicts another view with parts exploded, in accordance with the embodiment of Fig. 4 (a). The said auxiliary storage unit 200 includes the casing 205 formed by the base member 205B, a right wall member 205R, and a left wall member 205L. The right wall member 205R, and the left wall member 205L are laterally disposed. The base member 205B is disposed rearward/downward and at least one of the primary cover member 215 (shown in Fig. 4 (b)) or the secondary cover member 215 securely close the casing from upward/front portion.

[00067] In the present embodiment, an alternate power source 171, which is different from the auxiliary storage unit 170 (shown in Fig. 2 (b)), is securely disposed in the auxiliary storage unit 200. For example, the alternate power source 171 is a Li-ion battery that is maintenance free compared to Lead-acid battery. However, the Li-ion battery conventionally available is having width substantially greater than a Lead-acid battery. However, the present subject matter enables storage of said alternate power source 171 with ease.

[00068] In one implementation, the alternate power source 171 is having a length around 115 millimeters, a height around 86 millimeters, and a width around 70 millimeters. The auxiliary storage unit 200 is capable of accommodating the power source 170 or 171 with a first side disposed along the lateral direction RH-LH and a second side disposed along the longitudinal direction having a ratio in the range of 0.45 to 1.65. Thus, the present subject matter enables accommodation of auxiliary power sources with varying

dimensions at the same time accommodating other electrical components like controllers compactly.

[00069] The auxiliary storage unit 200 includes a support member 205S mounted to the base member 205B. The support member 205S includes at least one stepped portion 205SF, 205SS (similar to support member shown in Fig. 2 (b)) disposed at a lateral off-set from the longitudinal axis F-R of the vehicle 100. Further, an intermediate portion 205SI is extending orthogonal to the at least one stepped portion 205SF, 205SS, which is lateral direction. The alternate power source 171 is disposed at the intermediate portion 205SI, wherein a long axis C-C of the alternate power source 171 is orthogonal to the longitudinal axis F-R of the vehicle 100. It is an advantage that the present subject matter enables mounting a Lead-acid battery or a Li-ion battery depending on user requirements with same ease and security.

[00070] Further, at least one electrical component is the controller 175 disposed at lateral offset from the lateral center of the vehicle 100. The auxiliary storage unit 200 further enables storage of another electrical component, which is the alternate power source 171 disposed in another first orientation with respect to the controller 175. Therefore, the battery 170 is disposed perpendicular to the control unit 175, wherein the first orientation is perpendicular to the controller.

[00071] Thus, in the current embodiment, the control unit 175 is disposed on the first step-portion 205SF and the alternate power source 171 is disposed orthogonal to the longitudinal axis F-R. Further, the alternate power source (171) is secured to the base member 205 through a securing member 171S having at least two arms. At least one arm of the at least two arms abuts the auxiliary power unit 171 and the securing member 171S is secured to the base member 205B through at least one other arm of the at least two arms. Thus, the securing member 171S restricts movement of the alternate auxiliary power source 171 thereby enabling secure mounting thereof.

[00072] It is to be understood that the aspects of the embodiments are not necessarily limited to the features described herein. Many modifications and variations of the present subject matter are possible in the light of above

disclosure. Therefore, within the scope of claims of the present subject matter, the present disclosure may be practiced other than as specifically described.

We claim:

1. A two-wheeled vehicle (100) comprising:
 - a frame assembly (105) including a head tube (105A), a main tube(105B) extending rearwardly downward from the head tube (105A), a floor tube
 - 5 (105C) disposed substantially horizontally extends rearward from a rear portion of the main tube (105B), and a rear tube (105D) extending inclinedly rearward from a rear portion of the floor tube (105C),
 - wherein
 - an auxiliary storage unit (200) mounted to the rear tube (105D), the
 - 10 auxiliary storage unit (200) includes a support member (205S) capable of securely holding one or more electrical components (170, 175, 171) and at least one electrical component (175) of said one or more electrical components (170, 175, 171) is disposed at a lateral off-set from a lateral center of the vehicle (100)., and said one or more electrical components (170, 171)
 - 15 excluding said at least one electrical component (175) is disposed in said first orientation with respect to said at least one electrical component (175).
2. The two-wheeled vehicle (100) as claimed in claim 1, wherein the one or more electrical components (175) are accessible by detaching at least one of a primary cover member (210) and a secondary cover member (215), and wherein
- 20 support member (205S) is mounted to a base member (205B) of the auxiliary unit (200) and the auxiliary storage unit (200) is secured to the rear tube (105D) through the base member (205B), and wherein said primary cover member (210) is having a semi-cuboid structure and is mounted to said base member (205B) forming a closed structure.
- 25 3. The two-wheeled vehicle (100) as claimed in claim 1, wherein the support member (205S) includes a first stepped portion (205SF) disposed on one lateral side of a mid-portion (205BM) of said base member (205B) and the second stepped portion (205SS) disposed on other lateral side of said mid-portion (205BM), and the first stepped portion (205SF) and the second stepped portion (205SS) enable in
- 30 securely holding the one or more electrical components (170, 175) thereat, and

wherein said mid-portion (205BM) is provided with a cross-section complementing profile of said rear tube (105D) and said mid-portion (205BM) extends along a long axis (B-B $\parallel$) of the base member (205B) and said mid-portion (205BM) annularly abuts at least a portion of said rear tube (105D).

5 4. The two-wheeled vehicle (100) as claimed in claim 1, wherein the support member (205S) includes at least one stepped portion (205SF, 205SS) disposed at a lateral off-set from a lateral center, and an intermediate portion (205SI) extending orthogonal to said at least one stepped portion (205SF, 205SS), wherein an
10 alternate power source (171) of said one or more electrical components (170, 171, 175) is disposed at said intermediate portion (205SI) in said orientation with along axis (C-C $\parallel$) of said alternate power source (171) orthogonal to a longitudinal axis (F-R) of said vehicle (100), and wherein said alternate power source (171) is secured to said auxiliary storage unit (200) through a securing member (171S) having at least two arms and at least one arm of said at least two arms abuts said
15 auxiliary power unit (171) and said securing member (171S) is secured to said base member (205B) through at least another arm of said at least two arms.

5. The two-wheeled vehicle (100) as claimed in claim 1 or 2, wherein the base member (205B) is mounted to the rear tube (105D) and a long axis (B-B $\parallel$) of said base member (205B) is extending substantially along an inclined portion of the
20 rear tube (105D), and at least one of the first stepped portion (205SF) and the second stepped portion (205SS) extend substantially in a longitudinal direction (F-R) adjacent to said rear tube (105D).

6. The two-wheeled vehicle (100) as claimed in claim 1, wherein the one or more electrical components (170, 175) are enclosed by the primary cover member (210) secured to the support member (205S), and the primary cover member (210) is
25 detachable subsequent to detachment of a secondary cover member (215), and wherein said one or more electrical components (170, 175) are functionally coupled to a power unit (135) mounted to said floor tube(s) (105C) of said frame assembly (105).

7. The two-wheeled vehicle (100) as claimed in claim 1, wherein the auxiliary storage unit (200) is having a width (W1) substantially less than a width (W2) of the seat assembly (160).
8. The two-wheeled vehicle (100) as claimed in claim 1 or 3, wherein said first
5 step portion (205SF) and said second step portion (205SS) each define a shell with at least one opening for receiving said electrical components (170, 175), wherein said shell is adapted to have a cross-section complementing shape of said electrical components (170, 175).
9. The two-wheeled vehicle (100) as claimed in claim 1 or 2, wherein said
10 auxiliary storage unit (200) includes a casing (205) formed by said base member (205B), a right wall member (205R), and a left wall member (205L), wherein said right wall member (205R), and said left wall member (205L) are laterally disposed and securely cover the electronic components or the like (170, 175) from lateral directions (RH, LH), and wherein the casing (205) defines a storage space (S) that
15 is accessible in a detached condition of the secondary cover member (215), and wherein said space (S) is defined by said base member (205B) from bottom, said right wall member (205R) from the right, said left wall member (205L) from the left, and said primary cover member (210) from rear.
10. The two-wheeled vehicle (100) as claimed in claim 1, wherein said support
20 member (205S) is disposed at a first angle with respect to the base member (205B), wherein said first angle is an acute angle, and wherein said support member (205S) is provided with one or more ribs (205RR) disposed vertically connecting the support member (205S) to the base member (205B).

I/We claim:

1. A two-wheeled vehicle (100) comprising:
a frame assembly (105) including a head tube (105A), a main tube(105B)
extending rearwardly downward from the head tube (105A), a floor tube
5 (105C) disposed substantially horizontally extends rearward from a rear
portion of the main tube (105B), and a rear tube (105D) extending inclinedly
rearward from a rear portion of the floor tube (105C), an auxiliary storage unit
(200) mounted to the rear tube (105D), the auxiliary storage unit (200)
includes a support member (205S) capable of securely holding one or more
10 electrical components (170, 175, 171) and at least one electrical component
(175) of said one or more electrical components (170, 175, 171) is disposed at
a lateral off-set from a lateral center of the vehicle (100), and said one or more
electrical components (170, 171) excluding said at least one electrical
component (175) is disposed in said first orientation with respect to said at
15 least one electrical component (175).
2. The two-wheeled vehicle (100) as claimed in claim 1, wherein the one or more
electrical components (175) are accessible by detaching at least one of a primary
cover member (210) and a secondary cover member (215).
3. The two-wheeled vehicle (100) as claimed in claim 1, wherein said support
20 member (205S) is mounted to a base member (205B) of the auxiliary unit (200)
and the auxiliary storage unit (200) is secured to the rear tube (105D) through the
base member (205B), and wherein said primary cover member (210) is having a
semi-cuboid structure and is mounted to said base member (205B) forming a
closed structure.
- 25 4. The two-wheeled vehicle (100) as claimed in claim 1, wherein the support
member (205S) includes a first stepped portion (205SF) disposed on one lateral
side of a mid-portion (205BM) of said base member (205B) and the second stepped
portion (205SS) disposed on other lateral side of said mid-portion (205BM), and
the first stepped portion (205SF) and the second stepped portion (205SS) enable in
30 securely holding the one or more electrical components (170, 175) thereat.

5. The two-wheeled vehicle (100) as claimed in claim 1 or 4, wherein said mid-portion (205BM) is provided with a cross-section complementing profile of said rear tube (105D) and said mid-portion (205BM) extends along a long axis (B-B $\parallel$) of the base member (205B) and said mid-portion (205BM) annularly abuts at least a portion of said rear tube (105D).

6. The two-wheeled vehicle (100) as claimed in claim 1, wherein the support member (205S) includes at least one stepped portion (205SF, 205SS) disposed at a lateral off-set from a lateral center, and an intermediate portion (205SI) extending orthogonal to said at least one stepped portion (205SF, 205SS), wherein an alternate power source (171) of said one or more electrical components (170, 171, 175) is disposed at said intermediate portion (205SI) in said orientation with along axis (C-C $\parallel$) of said alternate power source (171) orthogonal to a longitudinal axis (F-R) of said vehicle (100).

7. The two-wheeled vehicle (100) as claimed in claim 1 or 6, wherein said alternate power source (171) is secured to said auxiliary storage unit (200) through a securing member (171S) having at least two arms and at least one arm of said at least two arms abuts said auxiliary power unit (171) and said securing member (171S) is secured to said base member (205B) through at least another arm of said at least two arms.

8. The two-wheeled vehicle (100) as claimed in claim 1 or 3, wherein the base member (205B) is mounted to the rear tube (105D) and a long axis (B-B $\parallel$) of said base member (205B) is extending substantially along an inclined portion of the rear tube (105D), and at least one of the first stepped portion (205SF) and the second stepped portion (205SS) extend substantially in a longitudinal direction (F-R) adjacent to said rear tube (105D).

9. The two-wheeled vehicle (100) as claimed in claim 1 or 2, wherein the one or more electrical components (170, 175) are enclosed by the primary cover member (210) secured to the support member (205S), and the primary cover member (210) is detachable subsequent to detachment of a secondary cover member (215), and wherein said one or more electrical components (170, 175) are functionally

coupled to a power unit (135) mounted to said floor tube(s) (105C) of said frame assembly (105).

10. The two-wheeled vehicle (100) as claimed in claim 1, wherein the auxiliary storage unit (200) is having a width (W1) substantially less than a width (W2) of
5 the seat assembly (160).

11. The two-wheeled vehicle (100) as claimed in claim 1 or 3, wherein said first step portion (205SF) and said second step portion (205SS) each define a shell with at least one opening for receiving said electrical components (170, 175), wherein said shell is adapted to have a cross-section complementing shape of said electrical
10 components (170, 175).

12. The two-wheeled vehicle (100) as claimed in claim 1 or 2, wherein said auxiliary storage unit (200) includes a casing (205) formed by said base member (205B), a right wall member (205R), and a left wall member (205L), wherein said right wall member (205R), and said left wall member (205L) are laterally disposed
15 and securely cover the electronic components or the like (170, 175) from lateral directions (RH, LH).

13. The two-wheeled vehicle (100) as claimed in claim 1, wherein the casing (205) defines a storage space (S) that is accessible in a detached condition of the secondary cover member (215), and wherein said space (S) is defined by said base
20 member (205B) from bottom, said right wall member (205R) from the right, said left wall member (205L) from the left, and said primary cover member (210) from rear.

14. The two-wheeled vehicle (100) as claimed in claim 1, wherein said support member (205S) is disposed at a first angle with respect to the base member (205B),
25 wherein said first angle is an acute angle, and wherein said support member (205S) is provided with one or more ribs (205RR) disposed vertically connecting the support member (205S) to the base member (205B).

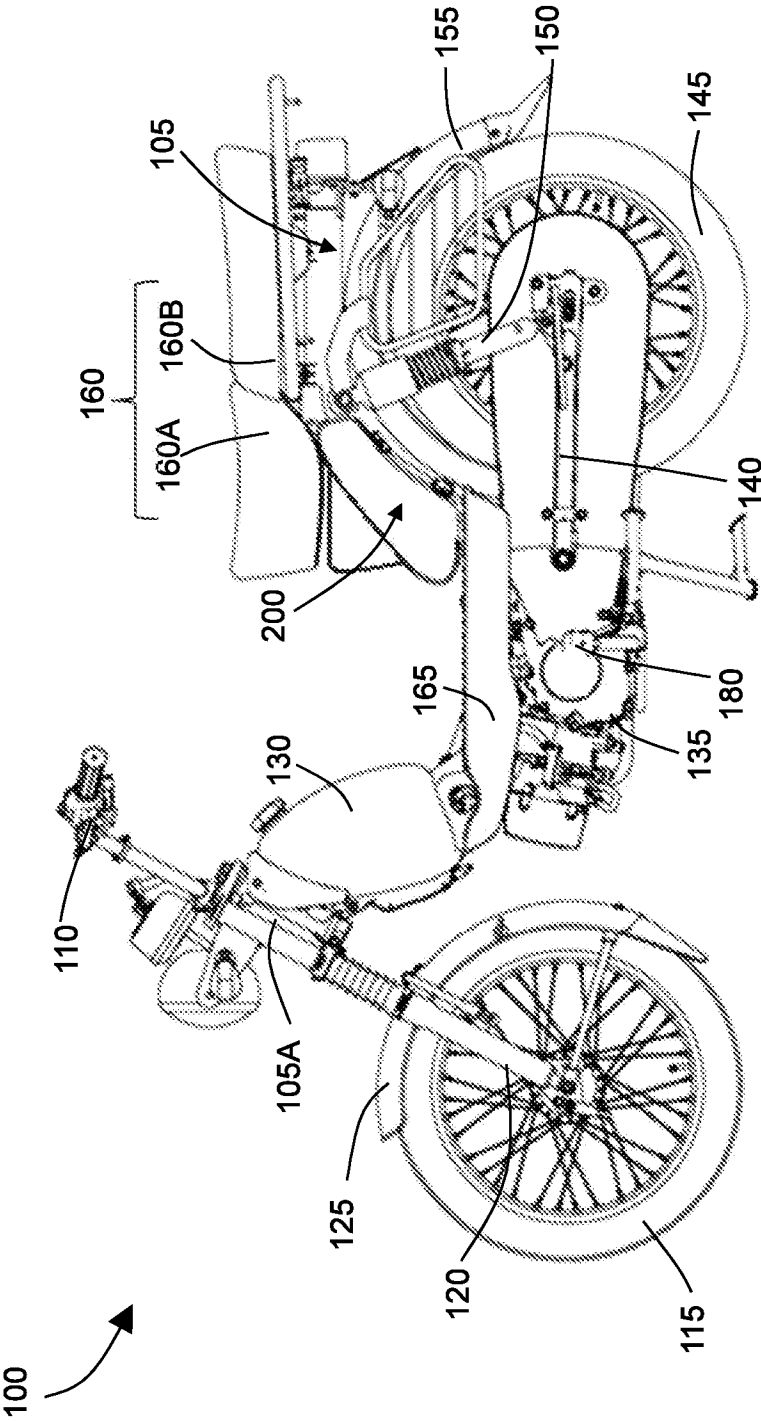
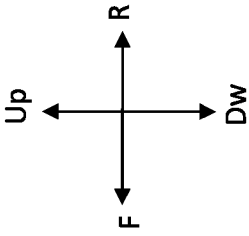


Fig. 1 (a)

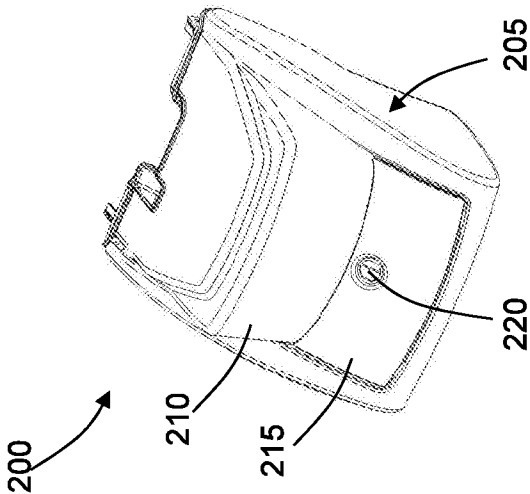
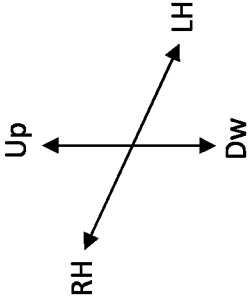


Fig. 2
(a)

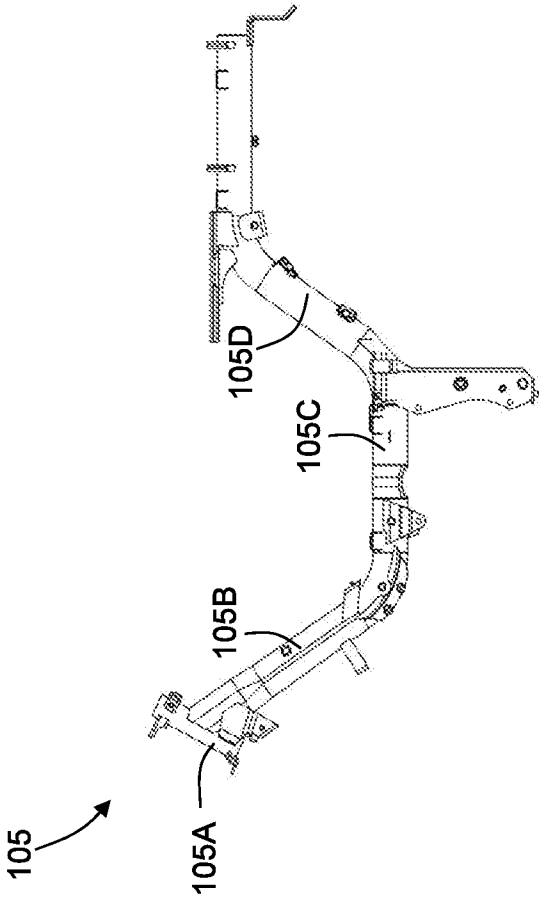
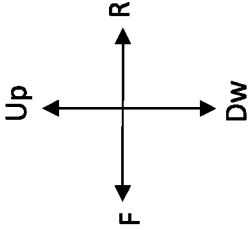


Fig. 1 (b)

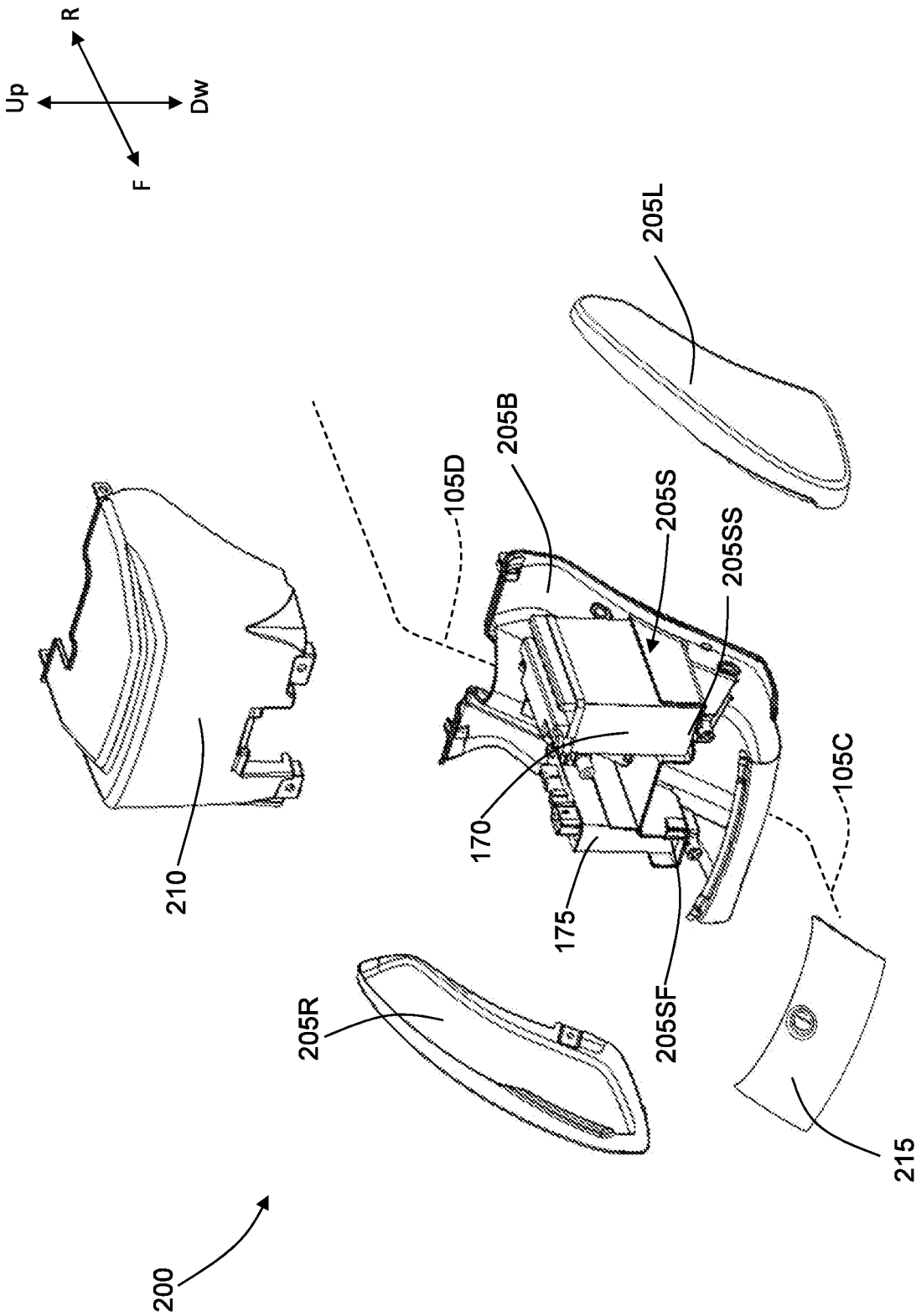


Fig. 2 (b)

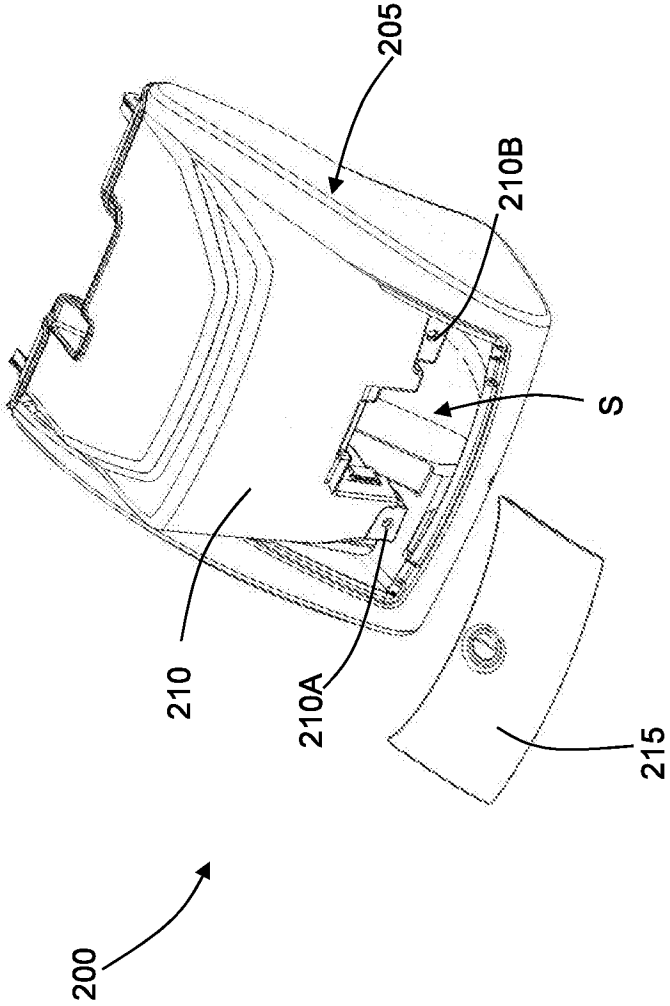
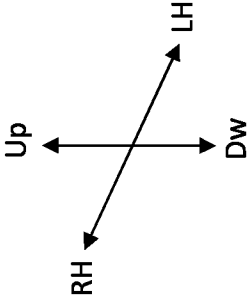


Fig. 2 (c)

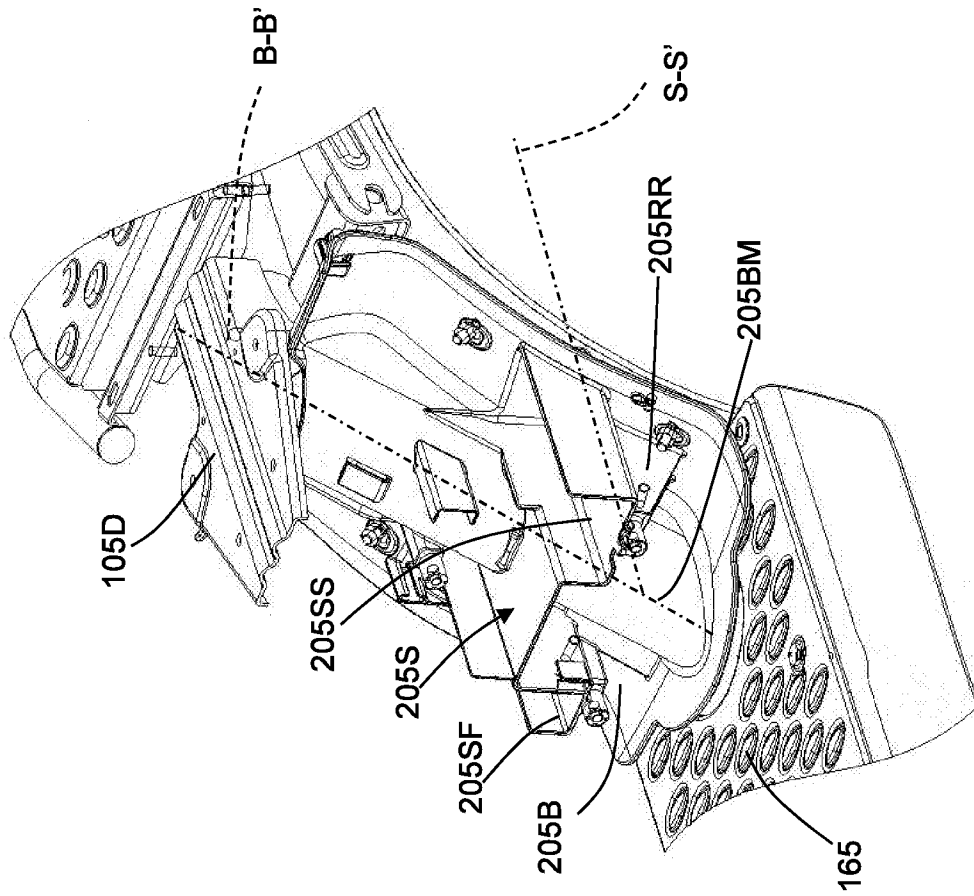
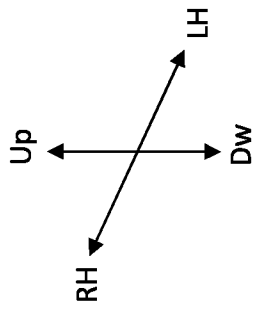


Fig. 2 (d)

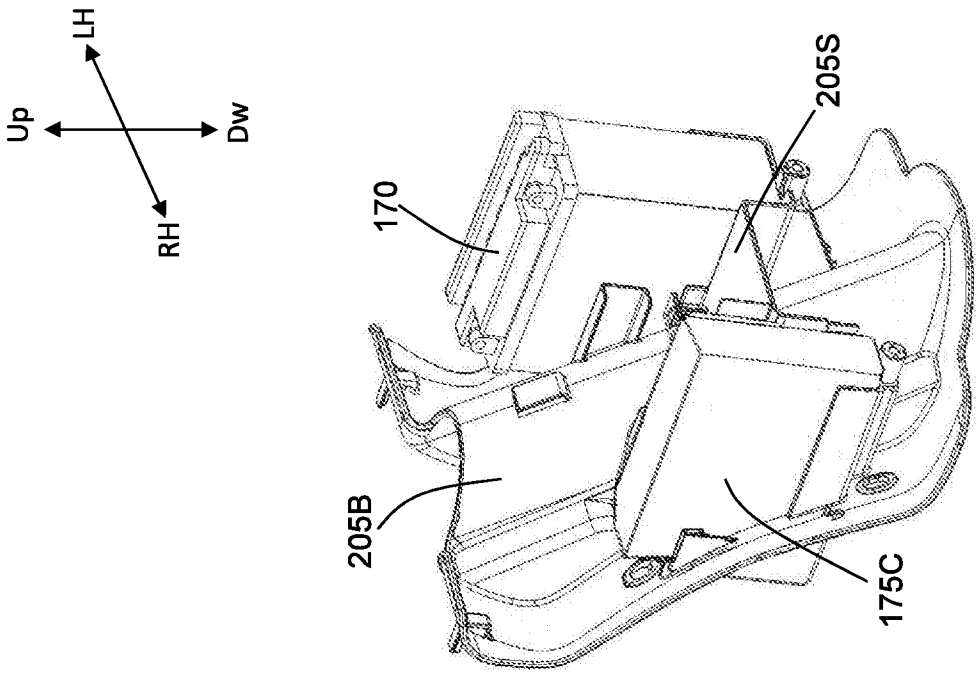


Fig. 2 (f)

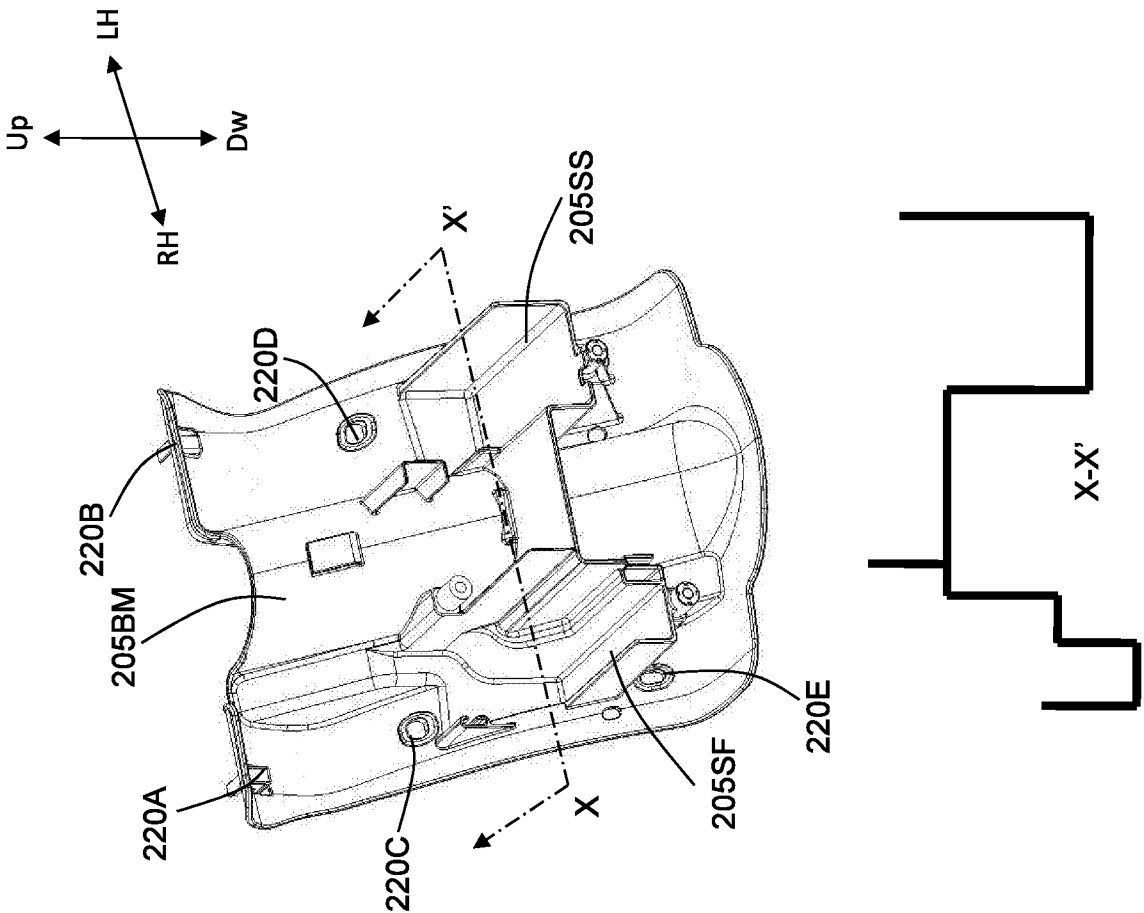


Fig. 2 (e)

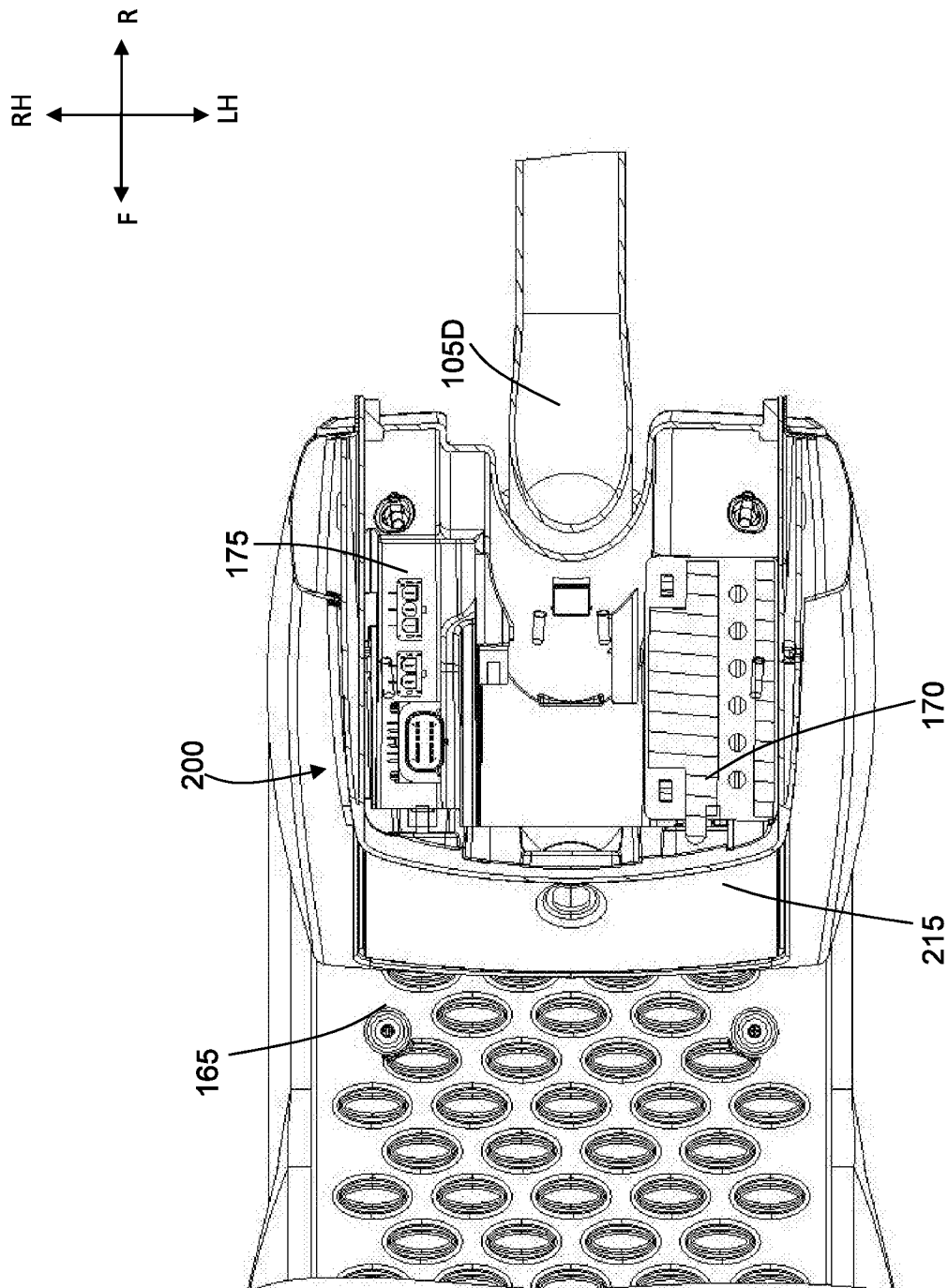


Fig. 3 (a)

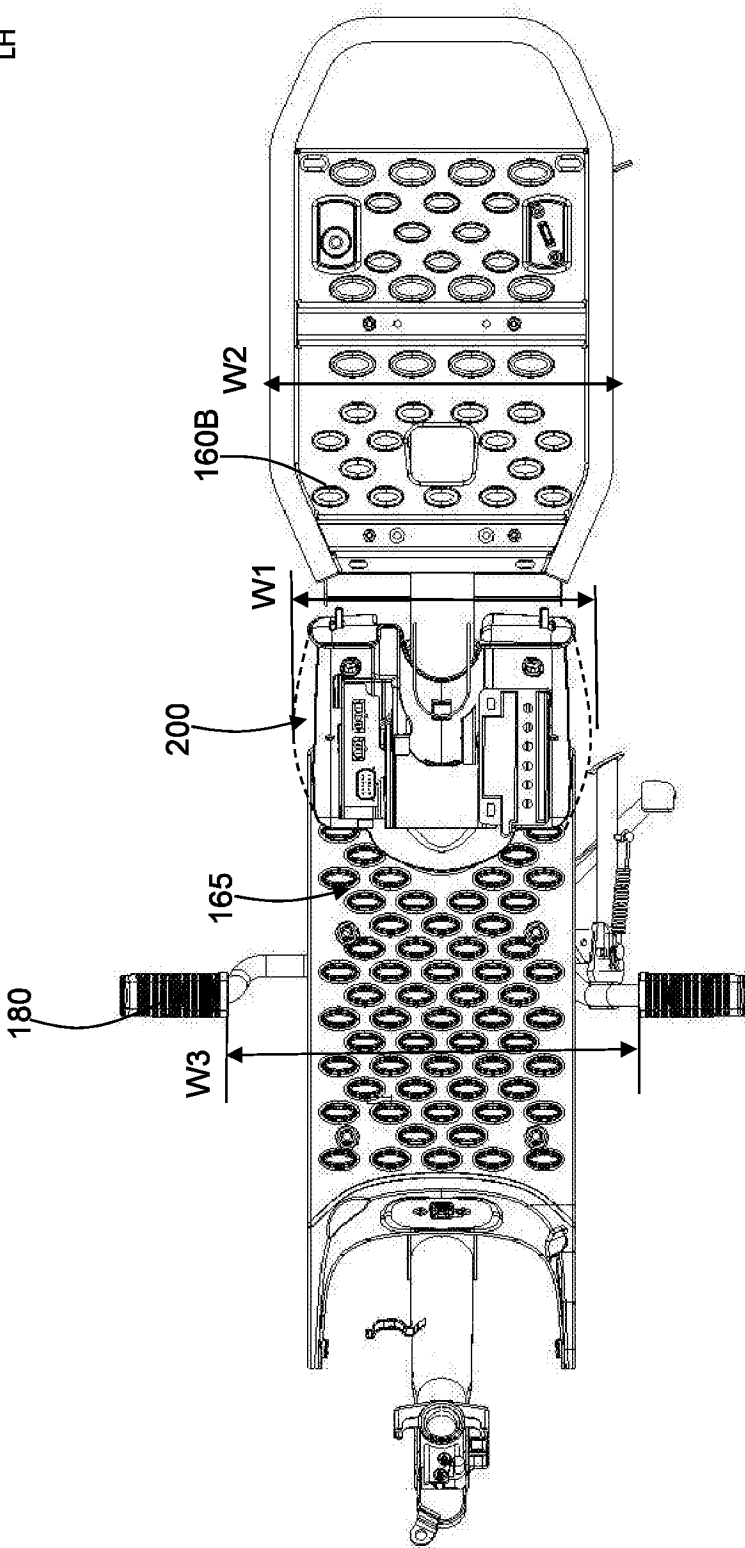
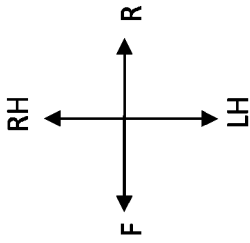


Fig. 3 (b)

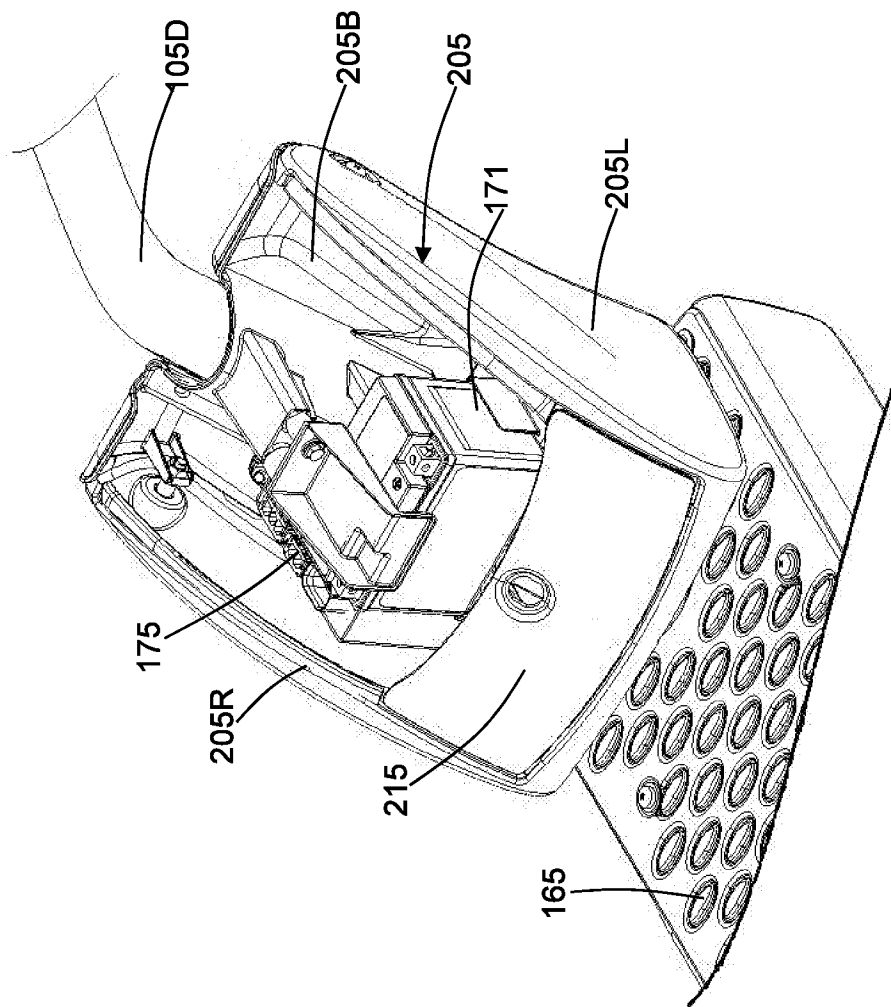
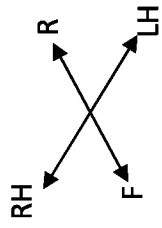


Fig. 4 (a)

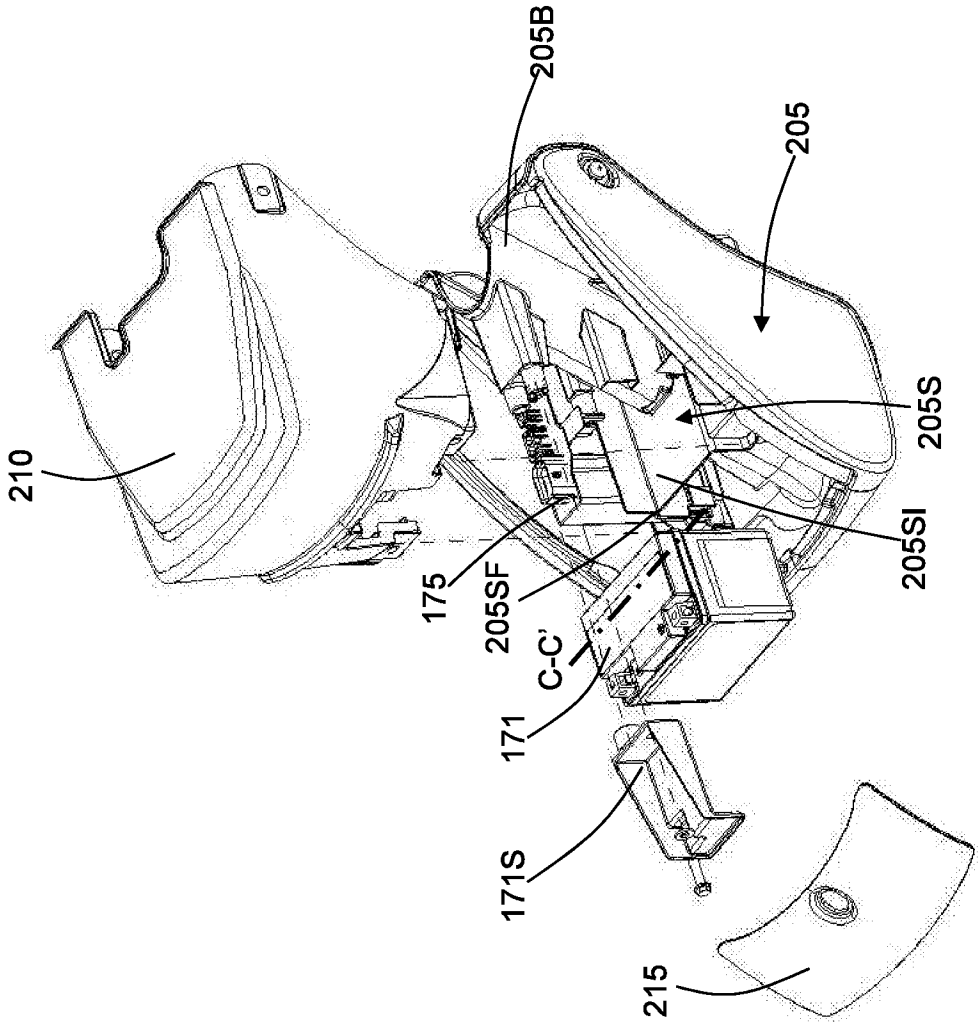
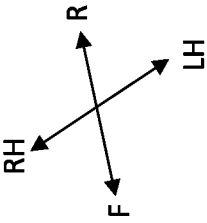


Fig. 4 (b)

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2017/055946

A. CLASSIFICATION OF SUBJECT MATTER
INV. B62J9/00 B62K11/06
ADD.

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)
B62J B62K B62M

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 3 050422 B2 (YAMAHA MOTOR CO LTD) 12 June 2000 (2000-06-12) figures 1-3 -----	1,3,5-8, 11,12, 14,15, 18-22
X	JP 2008 132860 A (HONDA MOTOR CO LTD) 12 June 2008 (2008-06-12) abstract; figures 1-5 -----	1,2, 6-14,16, 19-24
X	JP 2012 025198 A (HONDA MOTOR CO LTD) 9 February 2012 (2012-02-09) figures 1-8 -----	1,4, 6-12,14, 16,17, 19-24



Further documents are listed in the continuation of Box C.



See patent family annex.

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

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"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

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Date of the actual completion of the international search

7 March 2018

Date of mailing of the international search report

15/03/2018

Name and mailing address of the ISA/

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Authorized officer

Truchot, Alexandre

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2017/055946

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