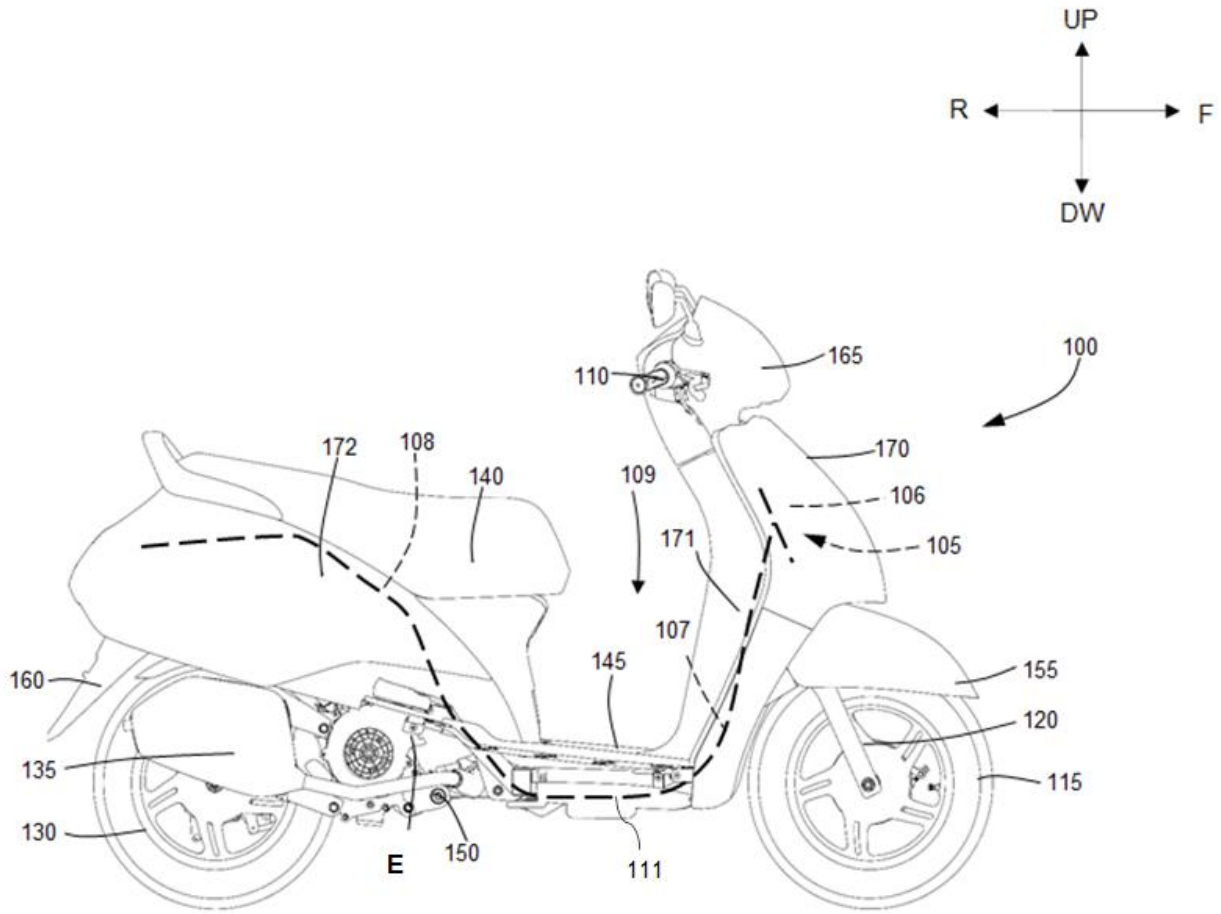

Figure 1

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TVS Motor Company Limited

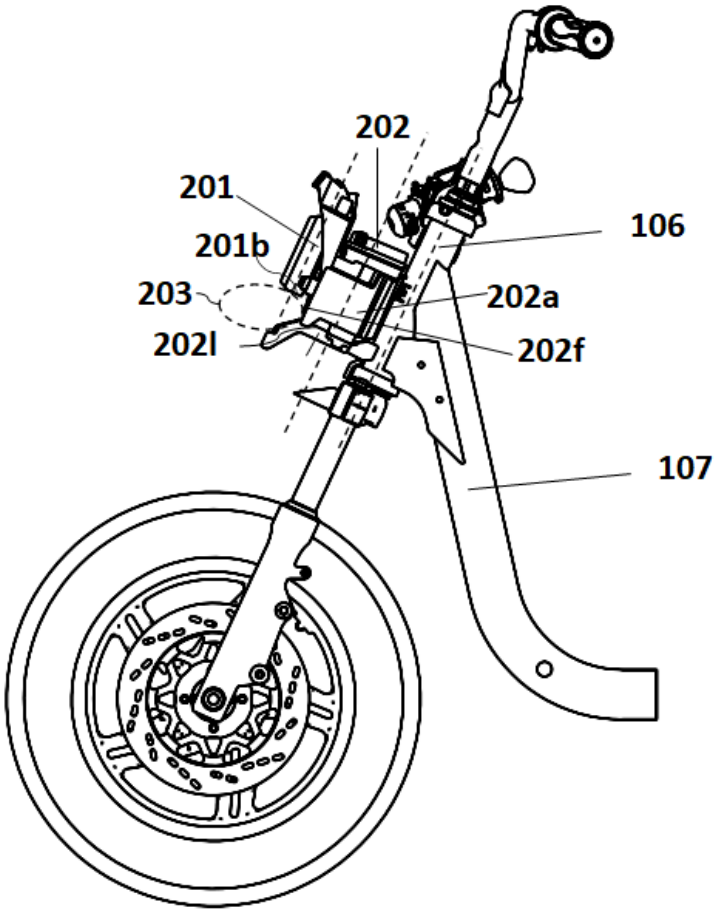

Figure 2(a)

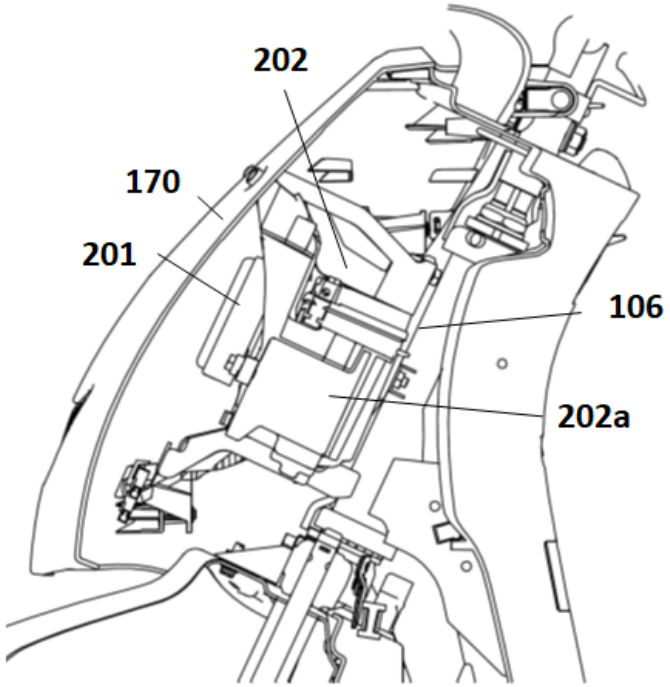

Figure 2(b)

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Head IP
TVS Motor Company Limited

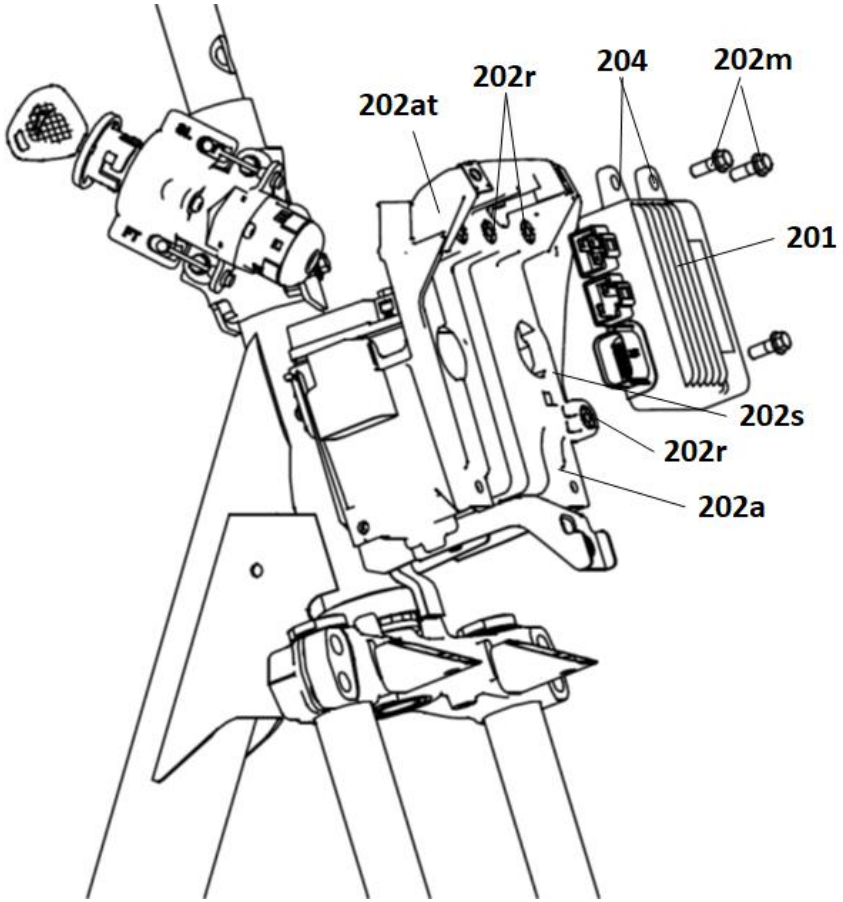

Figure 3

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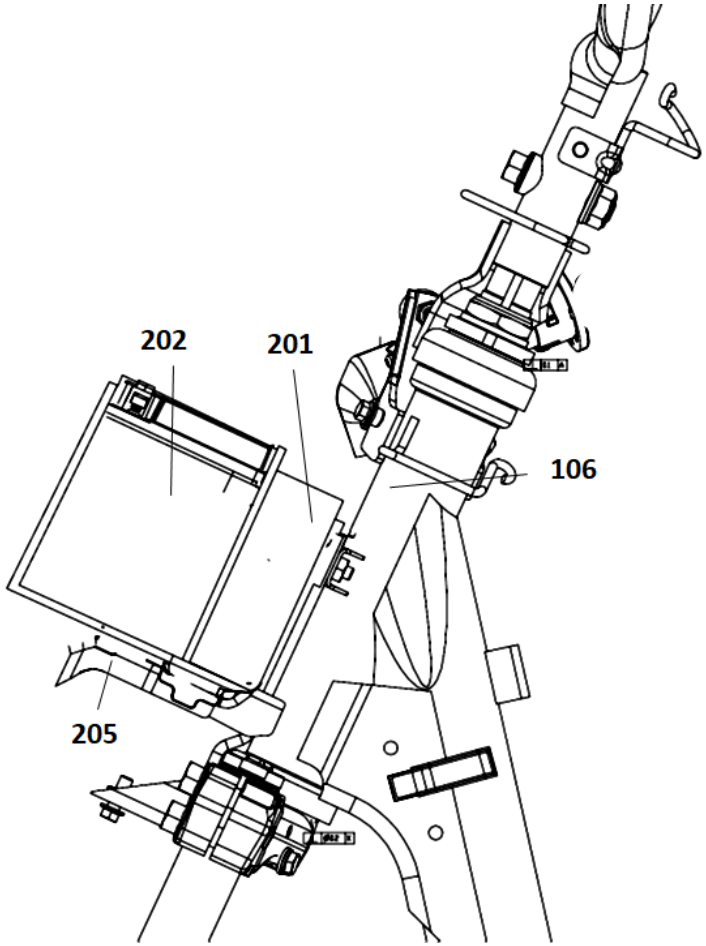

Figure 4

[Digitally Signed]
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TVS Motor Company Limited

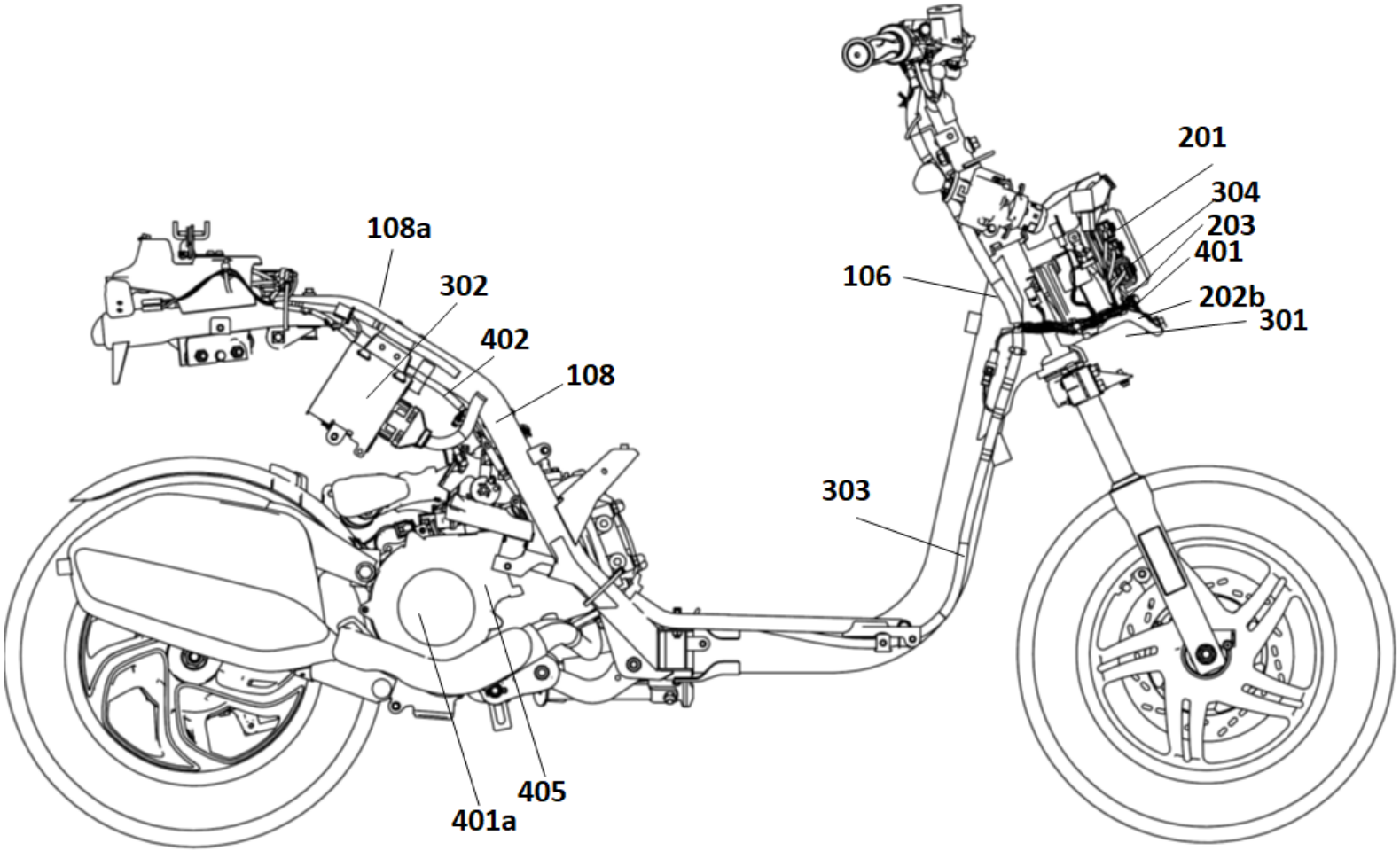

Figure 5

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Head IP
TVS Motor Company Limited

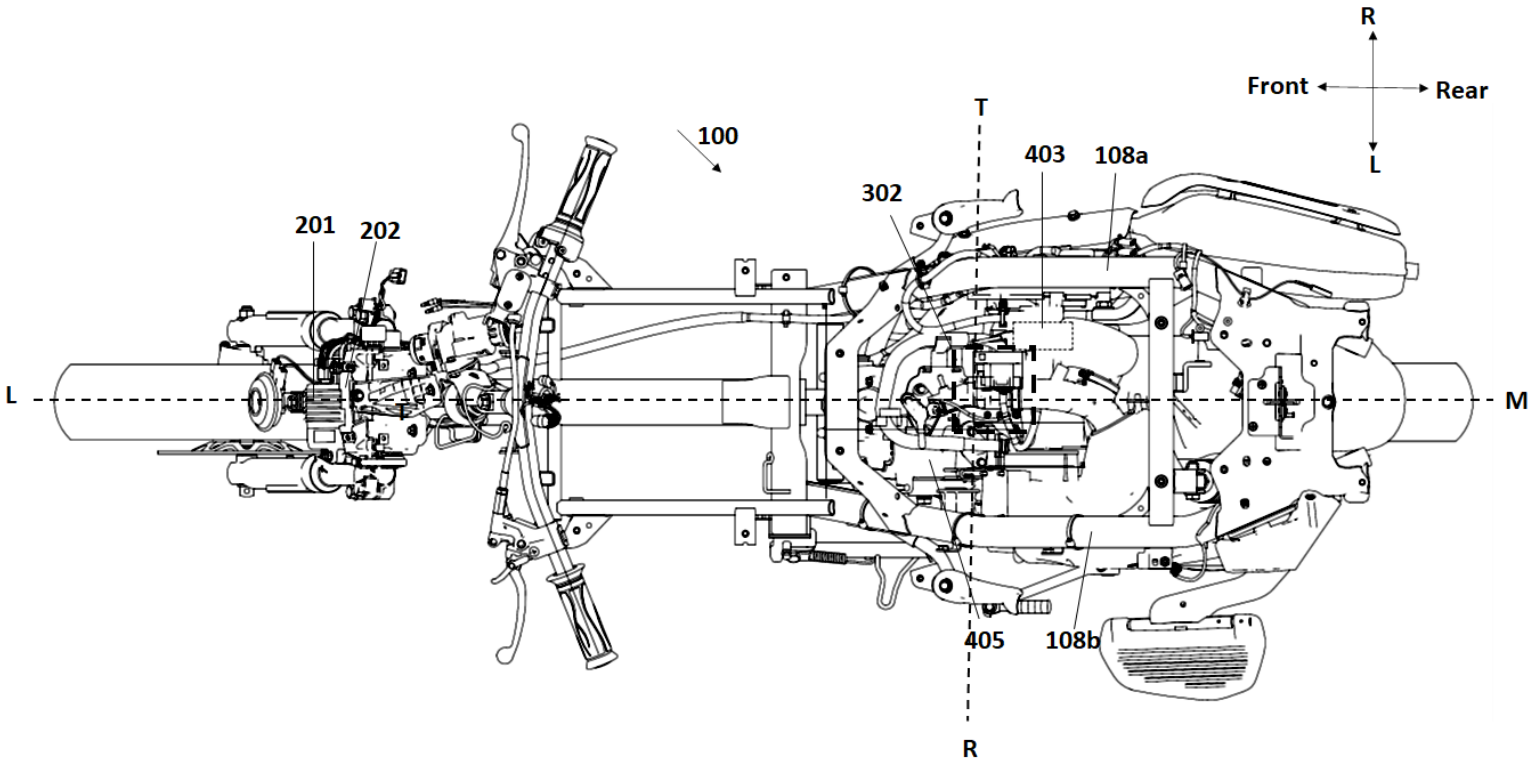

Figure 6

[Digitally Signed]
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Head IP
TVS Motor Company Limited

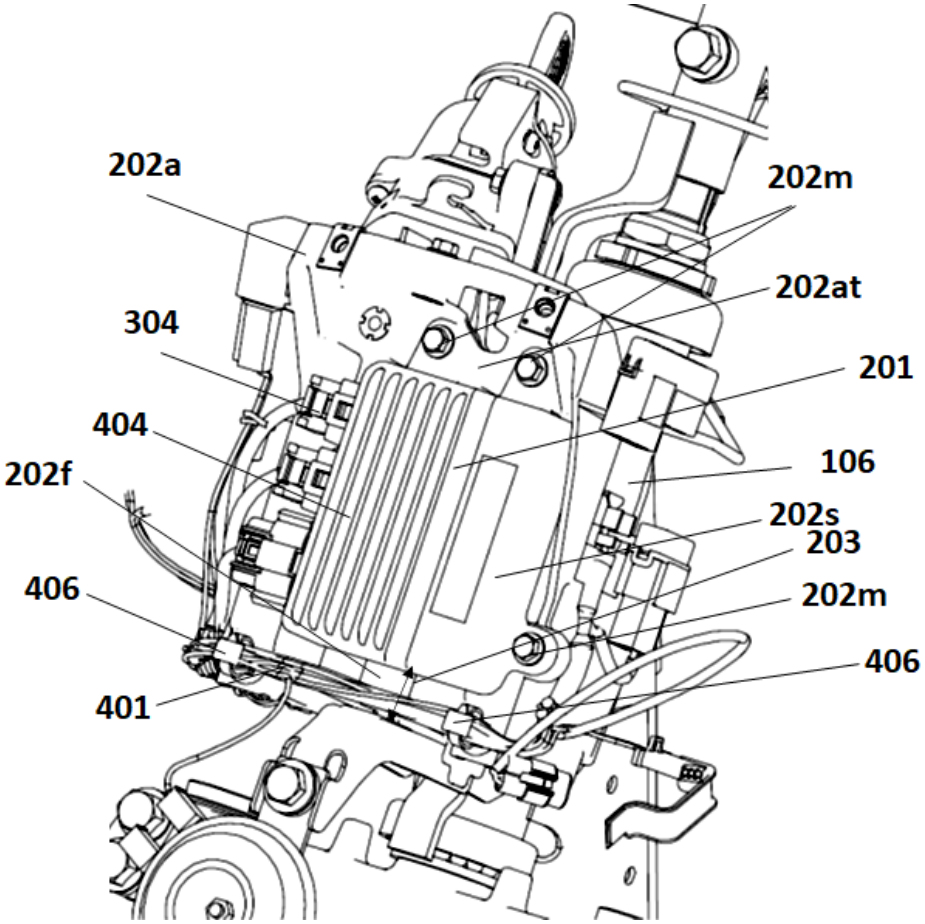

Figure 7

[Digitally Signed]
Chandan Chavan
Head IP
TVS Motor Company Limited

FORM 2

THE PATENTS ACT, 1970

(39 of 1970)

&

The Patents Rules, 2003

COMPLETE SPECIFICATION

(See Section 10 and Rule 13)

A STRADDLE-TYPE VEHICLE

APPLICANT:

TVS MOTOR COMPANY LIMITED, an Indian Company at:

TVS Motor Company Limited, Chaitanya", No.12 Khader Nawaz Khan Road, Nungambakkam, Chennai 600 006.

The following specification fully and particularly describes the invention and the manner in which it is to be performed.

TECHNICAL FIELD

[0001] The present subject matter relates to a straddle-type vehicle. More particularly but not exclusively, to vehicle layout of the straddle-type vehicle for packaging of one or more control units in the vehicle.

BACKGROUND

[0002] In conventional vehicles, one or more control units are packaged on frame assembly of the vehicle. The packaging of the one or more control units are achieved by mounting the one or more control units by means of mounting brackets. The mounting brackets are welded on the frame assembly. The frame assembly consisting of mounting brackets is usually covered by plurality of body panels made of plastic or metals and the body panels are fastened at all intended joints. The plurality of body panels should be configured such that they can completely cover the frame along with the mounting brackets as desired, in the vehicle. The one or more control units along with their mounting brackets are disposed either on right side or left side of the vehicle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The detailed description is described with reference to an embodiment of a saddle type two wheeled with accompanying figures. The same numbers are used throughout the drawings to reference like features and components.

[0004] **Figure 1** depicts a side view of an exemplary saddle-type vehicle 100, in accordance with an embodiment of the present subject matter.

[0005] **Figure 2a** illustrates a side view of a front portion of the straddle-type vehicle comprising a front frame.

[0006] **Figure 2b** illustrates a side view of a front portion of the straddle-type vehicle comprising a front frame and a front panel.

[0007] **Figure 3** illustrates a side view of an exploded view of the second controller with the holder.

[0008] **Figure 4** illustrates a side view of a front portion of the straddle type vehicle.

[0009] **Figure 5** illustrates a vehicle layout of the straddle type vehicle according to an embodiment of the present invention.

[00010] **Figure 6** illustrates a plan view of the straddle type vehicle according to an embodiment of the present invention.

[00011] **Figure 7** illustrates a detailed view of the second controller mounted to the holder.

DETAILED DESCRIPTION OF THE INVENTION

[00012] In conventional vehicles, in a known art, the mounting locations for one or more controllers, in particular, a controller to control generator, generally known as an ISG controller includes mounting of the ISG controller on one side of a main frame of a frame assembly of the vehicle. In the vehicle, the ISG controller lies between the side of the main frame and a side panel that covers the side of the main frame. Generally, as known in the art, the ISG controller is bigger in size and rectangular in shape. The ISG controller with bigger dimensions requires pre-defined space, wherein the space is capable of accommodating the ISG controller that is larger in size. To achieve the same, the shape and size of the side panel may undergo changes as required to facilitate accommodating of the ISG controller. The requirement of change in the side panel, that is able to cover the length and width of the bigger ISG controller arises which can adversely impact the compact packaging and width of the vehicle.

[00013] Further, the ISG controller is mounted on the frame assembly. The mounting of the ISG controller on the frame assembly is facilitated by one or more brackets welded on the frame assembly. If mounted on the frame assembly, then typically the mounting is carried out only at one portion of the ISG. The mounting, wherein only a portion of the ISG controller is configured for mounting the ISG, facilitates usage of smaller brackets as mounting means and thereby eliminate undesirable bigger brackets. The bigger brackets require a bigger welded joint with the frame assembly. However, the conventional mounting means by means of a portion of the SIG controller, being used to mount the ISG controller on the frame assembly causes overhang of the ISG controller. The overhang produces unwanted vibrations that may adversely affect stable functionality of the ISG controller.

[00014] Further, the mounting of the ISG controller on any other portion of the frame assembly may cause compromise in utility space available for storage, in addition to compromise in storage space of a fuel tank assembly. Utility space in addition to fuel tank volume.

[00015] For example, in sleeker vehicles, a rear portion has shape that is comparatively compact. In such sleeker vehicles, the space available between the side panels and portion of the frame assembly is almost negligible. In this particular type of compact layout vehicle, the mounting of the ISG controller may have to be shifted towards a vehicle center line. The presence of the ISG controller closer to the vehicle center line has undesirable impact on the utility space and also adds to the requirement of modification in shape of a utility box to accordingly match with the profile of the ISG controller exists.

[00016] The ISG controller comprises of plurality pins to connect with one or more couplers and wiring harness from systems like a power source, an auxiliary energy source, etc.

[00017] The mounting of the ISG controller and the location of the ISG controller in the vehicle plays an important role. The orientation of the one or more couplers should be such that the accessibility of the one or more couplers is hassle free for ease of service and maintenance. The accessibility of the one or more couplers is critical for service as well as wiring harness routing. However, in sleeker vehicles, as explained in the above conventional vehicles, the one or more couplers, being disposed closer to the vehicle center plane and being away from the external surface of the vehicle body, cannot be accessed easily.

[00018] Further, the location of the ISG controller in the vehicle should be such that the vehicle layout includes space for wiring harness that connects between the ISG controller and the systems like a power source, an auxiliary energy source, etc. The vehicle layout should be such that a various size of wiring harness can be accommodated. Additionally, the distribution of the wiring harness for various vehicle aggregates from the front most headlamp unit to the tail lamp unit tend to span over the length and breadth of the entire vehicle volume thereby leading to need of configuring plurality of wiring harness in the vehicle which can be in order of minimum 3 sets of wiring harness or more. Thus, there exists as challenge of minimizing the wiring harness sets as well as routing them in a hassle-free manner so that they do not entangle with each other, are easy for assembly, service, fault detection, as well as avoid any undesirable electromagnetic interference. The space for wiring harness available in the vehicle layout is an important factor to

be considered. The wiring harness in the vehicle layout should be routed such that all the clearance requirements including non-interference with other parts in the vehicle and other sub systems is achieved.

[00019] The interference of the wiring harness with other sub-systems in the vehicle may cause undesired vibrations and loosening of various wires/cables involved in the wiring harness. Further, there might be chance of occurrence of short circuit due to constant pressure exhibited on the wiring harness through physical and/ or electromagnetic interference with the sub-systems.

[00020] Unwanted vibrations also directly affect the vehicle drivability condition.

[00021] The location of the ISG controller in the vehicle also should be such that the ISG controller is not affected by heat emanated by the sub-systems and surrounding parts that may adversely affect the performance of the ISG controller. Further, the ISG controller should not be affected due to entry of water to avoid circuit damages due to short circuiting, etc.

[00022] The ISG controller unit mounting should be stable to avoid any unwanted vibrations which directly effects the vehicle drivability condition.

[00023] Ideally, the two wheeled vehicles should be standing upright. However, there is always small amount of unbalanced weight on either the right-hand side or on the left-hand side of the vehicle. Because of which, the two-wheeled vehicle tends to lean either on the right-hand side or the left-hand side depending on the unbalanced weight on that respective side of the vehicle.

[00024] The location and mounting of the ISG controller in the vehicle should be such that the vehicle riding is not affected due to any such imbalance.

[00025] Therefore, there is a need for an improved layout and mounting configuration of an ISG controller which provides stable mounting of the ISG controller along with better accessibility location for the service in the vehicle layout that does not affect balance of the vehicle.

[00026] The present subject matter provides an improved vehicle layout configured to provide stable mounting of the ISG controller and includes pre-defined space to accommodate one or more wiring harness.

[00027] According to an embodiment of the present invention, a straddle-type vehicle includes a power source to drive the vehicle. The power source includes a sub-power source. For example,

the power source is an engine assembly and the sub power source is an integrated-stater generator (ISG). The power source is controlled by one or more controllers. The one or more controllers include an electronic control unit (ECU) and a second controller. The second controller is for example, an ISG controller.

[00028] In an embodiment, the power source is disposed at a rear portion of the vehicle. The power source is disposed at center of the vehicle in left-right direction. The second controller is disposed in front of the power source. The second controller and the power source are disposed along a longitudinal axis. The longitudinal axis is passing through the center of the vehicle in a front-rear direction when viewed from a plan view.

[00029] According to an embodiment of the present invention, the control unit is disposed at a close proximity to the power source such that a transverse axis is passing between the control unit and the power source, such that, at least one side surface of the substantially rectangular control unit is disposed in a substantially orthogonal orientation to the axis of the drive shaft of the power source. In an aspect, the control unit is disposed on any one of rear frames of a pair of rear frames of the frame assembly of the vehicle. In another aspect, the control unit is additionally disposed above the power source.

[00030] According to an embodiment of the present invention, the second controller is disposed in front of a front frame of the frame assembly. In an aspect, the front frame is configured to support a holder in front of it. The holder is configured to receive and provide support to one or more auxiliary power source, like a battery. The holder is configured to support a portion of the second controller. In the present embodiment, the second controller is disposed in front of the auxiliary power source.

[00031] In another aspect, the second controller is mounted to and in front of the front frame. The auxiliary power source is disposed in front of the second controller.

[00032] The second controller is oriented and mounted in front of the front frame such that the routing of the wiring harness joining to the couplers and to other systems including the power source, the control unit etc. is hassle free. The vehicle layout of the straddle type vehicle provides pre-defined space for routing of the wiring harness through the length and width of the vehicle. The wiring harness is laid such that it does not interfere with the sub-systems and other parts in the vehicle.

[00033] The imbalance of the vehicle is prevented to a great extent by disposing the power source and the second controller along the longitudinal axis passing through the center of the vehicle in front-rear direction when viewed from the plan view. Most of the weight in the vehicle is concentrated along the longitudinal axis by preventing any offset of the systems/sub-systems towards right side or left side of the vehicle. This enables to keep the vehicle upright instead of having lean or imbalance forces acting on the vehicle.

[00034] The further explanation to the above said advantages of the present invention is provided in the detailed description of the figures below. The present subject matter is further described with reference to accompanying figures. It should be noted that the description and figures merely illustrate principles of the present subject matter. Various arrangements may be devised that, although not explicitly described or shown herein, encompass the principles of the present subject matter. Moreover, all statements herein reciting principles, aspects, and examples of the present subject matter, as well as specific examples thereof, are intended to encompass equivalents thereof.

[00035] Figure 1 depicts a side view of an exemplary saddle-type vehicle 100, in accordance with an embodiment of the present subject matter. The vehicle 100 has a frame assembly 105 (schematically shown with dotted lines) that includes a front frame 106, a main frame member 107 extending rearwardly downward from the front frame 106. The main frame member 107 may comprise one or more main frame(s), and pair of rear frames 108 extending inclinedly rearward from a rear portion of the main frame 107 and the pair of rear frames 108. In the present embodiment, the vehicle 100 includes a step through portion 109 defined by a central frame member 111 of the frame assembly 105. However, the aspects of the present subject matter are not limited to the depicted layout of the vehicle 100.

[00036] Further, a handlebar assembly 110 is connected to a front wheel 115 through one or more front suspension(s) 120. A steering shaft (not shown) connects the handlebar assembly 110 to the front suspension(s) 120 and the steering shaft is rotatably journaled about the front frame 106. A power source 405, for example an engine assembly is mounted to the frame assembly 105. The power source 405 may also include a traction motor either hub mounted or mounted adjacent to the engine assembly. In the depicted embodiment, the power source 405 is disposed below at least a portion of the pair of rear frames 108. However, in an alternative embodiment,

the power unit may be fixedly disposed towards front and below the main frame 107. The power source 405 is functionally connected to a rear wheel 130 through a transmission system (not shown). The vehicle 100 may include one or more rear wheel(s). Also, the vehicle 100 includes an exhaust system that helps in dissipation of exhaust gasses from the power source 405. The exhaust system includes a muffler 135 mounted to the vehicle 100. In the depicted embodiment, the muffler 135 is disposed towards one lateral side of the vehicle 100.

[00037] Further, the rear wheel 130 is connected to the frame assembly 105 through one or more rear suspension(s) (not shown). In the depicted embodiment, the power source 405 is swingably mounted to the frame assembly 105 through a toggle link 150 or the like. A seat assembly 140 is supported by the frame assembly 105 and is disposed rearward to the step-through portion 109.

[00038] Further, the vehicle 100 includes a front fender 155 covering at least a portion of the front wheel 115. In the present embodiment, a floorboard 145 is disposed at a step-through portion 109 and is supported by the main frame 107 and a pair of floor frame portions (not shown). In an embodiment, a fuel tank (not shown) is disposed below the seat assembly 140 and behind the utility box. A rear fender 160 is covering at least a portion of the rear wheel 130. The vehicle 100 comprises of plurality of electrical/electronic components including a headlight 165, a tail light (not shown), a battery (not shown), a transistor-controlled ignition (TCI) unit (not shown), an alternator (not shown), a starter motor (not shown). Further, the vehicle 100 may include a synchronous braking system, an anti-lock braking system.

[00039] The vehicle 100 comprises plurality of panels that include a front panel 170 disposed in an anterior portion of the front frame 106, a leg-shield 171 disposed in a posterior portion of the front frame 106. A rear panel assembly 172 includes a right-side panel and a left side panel disposed below the seat assembly 140 and extending rearward from a rear portion of the floorboard 145 towards a rear portion of the vehicle 100. The rear panel assembly 172 encloses a utility box disposed below the seat assembly 140. Also, the rear panel assembly 172 partially encloses the power source 405. Also, the muffler 135 of the exhaust system is coupled to exhaust side of the engine assembly and in an implementation the muffler 135 is disposed towards one lateral side of the vehicle 100.

[00040] Figure 2a illustrates a side view of a front portion of the straddle-type vehicle comprising a front frame. According to an embodiment of the present invention, the straddle

type vehicle includes the front frame 106 and the main frame 107 extending rearwardly from the front frame 106. The main frame 107 is inclined at an angle with respect to the main frame. The main frame 106 is configured to support a holder 202a. The holder 202a is configured to support one or more auxiliary energy sources 202, for example a battery. The holder 202a is further configured to support at least one of a control unit 302 (not shown in the present figure) and a second controller 201, such that, in assembled condition, at least one of the control unit 302 and the second controller 201 is disposed in front of the one or more auxiliary energy sources 202.

[00041] In an embodiment, the second controller 201 is disposed in front of the one or more auxiliary energy sources 202.

[00042] In an embodiment, the second controller 201 is disposed above a lower face 202l of the one or more auxiliary energy source 202. The second controller 201 is configured to be placed above the lower face 202l such that a pre-defined space 203 is formed below a bottom face 201b of the second controller 201 and the lower face 202l of the energy source 202.

[00043] In an embodiment, both the one or more auxiliary energy sources 202 and the second controller 201 are disposed substantially parallel to the front frame 106. The holder 202a is configured to support the one or more auxiliary energy sources 202 and the second controller 201 in parallel to the front frame 106. This provides stable and secure mounting of the holder 202a to the front frame 106 and the second controller 201 to the holder 202a. Referring to **Figure 2b**, the front panel 170 is configured to inclinedly cover the holder 202a, the one or more auxiliary energy sources 202, and the second controller 201. The holder 202a along with the one or more auxiliary energy sources 202 and the second controller 201 are disposed in parallel to the front frame 106 such that it does not interfere with the front panel 170. The vehicle layout along with the body panels are so configured that the pre-defined space between the front panel 170 and the front frame 106 is configured for accommodating and supporting the holder 202a along with the one or more auxiliary energy sources 202 and the second controller 201. Therefore, no modification of the front panel 170 is required according to the present subject-matter, which enables to achieve good aerodynamic profile of the front body panel as well as good aesthetics.

[00044] Further, one or more auxiliary energy sources 202 and the second controller 201 can be dismantled whenever required without disturbing the surrounding parts. Likewise, whenever, the

surrounding parts are to be accessed, the mounting of the one or more auxiliary energy sources 202 and the second controller 201 is not disturbed. This way, a stable mounting of the one or more auxiliary energy sources 202 and the second controller 201 is obtained as they are not disturbed due to interference with surrounding parts/sub-systems.

[00045] In another embodiment, a bottom face 201b of the second controller 201 is disposed above a lower face 202b of the auxiliary energy source 202. The bottom face 201b is disposed in front of and above the lower surface 2011 of the auxiliary energy source 202, such that a pre-defined space 203 is formed between a portion of a front face 202f of the holder 202a and the bottom face 201b. The pre-defined space 203 is formed in front of the portion of the front face 202f and below the bottom face 201b.

[00046] Figure 3 illustrates a side view of an exploded perspective view of the second controller with the holder. According to an embodiment of the present invention, the second controller 201 is detachably attached to the holder 202a. The holder 202a is configured to include one or more receiving portions 202r configured to receive one or more mounting members 202m that enable mounting of the second controller 201 to the holder 202a. In an embodiment, the one or more receiving portions 202r are configured in a top portion 202at and on any one of a laterally facing side surfaces 202s of the holder 202a. The one or more receiving portions 202r on the top portion 202at and on any one of the side surfaces 202s of the holder 202a enable multi-point mounting of the second controller 201 at various portions of the second controller 201. The mounting of the second controller 201 at various portions with multi-point or plurality of mounting means eliminates undesirable overhang of the second controller 201 thereby achieving a stable and vibration resistance mounting which is critical for error free performance of the controller.

[00047] Figure 4 illustrates a side view of a front portion of the straddle type vehicle. According to another embodiment of the present invention, the second controller 202 is disposed in front of the front frame 106 and mounted to the front frame 106. The one or more auxiliary energy sources 201 is disposed in front of the second controller 202. Both the one or more auxiliary energy sources 201 and the second controller 202 are supported by a bracket 205. The bracket 205 is fixedly attached to the front frame 106.

[00048] Figure 5 illustrates a vehicle layout of the straddle type vehicle according to an embodiment of the present invention. In an embodiment, a power source 405 is configured to

propel the vehicle. The power source 405 is controlled by a control unit 302. The control unit 302 is mounted to a one of a side tube 108 of the pair of rear frames (shown in figure 1). Further, the second controller 201 includes one or more couplers 304 configured to receive various inputs through a first wiring harness 401 and a second wiring harness 303. The first wiring harness 401 is routed below the second controller 201 in the pre-defined space 203 formed below the second controller 201. The first wiring harness 401 is protected in the pre-defined space 203 and is also covered by the front panel (shown in Figure 2a) thereby achieving a secure and safe wiring harness design. The front panel prevents entry of water particles below the second controller 201 and thereby preventing short circuiting of the first wiring harness that is connected to the one or more couplers 304.

[00049] In an embodiment, a sub-power source 401a is a part of the power source 405. The second controller 201 is configured to control the sub-power source 401a.

[00050] Further, in an embodiment the one or more couplers 304 are provided on the second controller 201 on a same side as the side in the vehicle comprising the control unit 302. The second wiring harness 303 routed between the one or more couplers 304 and the power source 405 is short while ensuring the control unit being disposed in close proximity of the power source 405 as well as configuring a secure, safe and stable layout of the auxiliary energy source of the vehicle. Further, the control unit 302 is oriented and mounted on a right-side rear frame 108a of the pair of rear frames 108 such that the one or more couplers 304 of the control unit 302 are easily accessible and do not interfere with the surrounding parts. This way, a third wiring harness 402 routed between the power source 405 and the control unit 302 is not subjected to stress, which otherwise would have been caused due to interference with the surrounding sub-systems. All the above said first wiring harness 401, second wiring harness 303 and the third wiring harness 402 do not include any sharp bends and hence, the communication speed between the sub-systems through the mentioned wiring harness is at optimum speed. The hassle-free routing as well as ease of service of the wiring harness is facilitated by the vehicle layout of the straddle type vehicle.

[00051] In an embodiment, the control unit 302 is disposed on the same side as that of the one or more couplers 304 in the vehicle. In an embodiment, the one or more couplers 304 are disposed on the right side of the second controller 201. The control unit 302 is also disposed on the right side of

the vehicle, such that a simpler routing of the second wiring harness 303 between the second controller 201 and the one or more couplers 304 is obtained.

[00052] In an embodiment, the first wiring harness 401, the second wiring harness 303, and the third wiring harness 402 are routed on any one of a right side and a left side of the vehicle and the control unit 302 is disposed on the same side as that of the first wiring harness 401, the second wiring harness 303, and the third wiring harness 402. The above said configuration provides for improved, simpler and cost-effective routing of the wiring harness.

[00053] Figure 6 illustrates a plan view of the straddle type vehicle according to an embodiment of the present invention. The power source 405 is configured to propel the vehicle 100. The control unit 302 is configured to control the power source 405 and the second controller 201 is configured to control a generator, for example, an integrated starter generator (ISG) of the power source 405.

[00054] In an embodiment, the second controller 201 and the power source 405 are disposed along a longitudinal axis LM. The control unit 302 is disposed at a close proximity to the power source 405. The control unit 302 is disposed along a transverse axis TR such that the transverse axis TR is a virtual line intersecting substantially orthogonally the power source 405 as well as the control unit 302. The longitudinal axis LM is passing through center of the vehicle 100 in a front-rear direction and the transverse axis TR is intersecting the longitudinal axis LM at an angle substantially normal to the axis LM. In the present embodiment the angle between the longitudinal axis LM and the transverse axis TR joining the power source 405 and the control unit 302 is zero. In the present embodiment, the control unit 302, the second controller 201 and the one or more auxiliary energy sources 202 are disposed along the same axis, which is the longitudinal axis LM. The longitudinal axis LM is passing through the center of the vehicle in a front-rear direction when viewed from a plan view.

[00055] In the present embodiment, the control unit 302 is disposed above the power source 405 and substantially at the lateral center of the vehicle as well as substantially in vicinity of the transverse axis TR in left-right direction (L-H). The power source 405 is disposed at the lateral center of the vehicle at a rear portion of the vehicle. The power source 405 is functionally coupled to a sub-power source 401a as shown in Figure 5, the sub-driving source 401a is a part of the power source 405, wherein the sub-power source 401a is configured to be controlled by the second

controller 201. In an embodiment, the second controller 201 is disposed in front of said front frame 106 and mounted to the front frame 106.

[00056] The control unit 302 and the second controller 201 are configured to receive power from the auxiliary energy source. The auxiliary energy source is disposed in front of the front frame and mounted to said front frame.

[00057] In an embodiment, the control unit 302 is disposed on a right-side rear frame 108a of the pair of rear frames 108. In another embodiment, the control unit 302 is disposed on a left-side rear frame 108b of the pair of rear frames 108.

[00058] **Figure 7** illustrates a detailed local perspective view of the second controller mounted to the holder. The pre-defined space 203 allows entry of atmospheric air therethrough and aids in cooling of the second controller 201 and the one or more auxiliary power sources. In an embodiment, the second controller 201 includes one or more fins 404 configured to receive atmospheric air for the purpose of faster dissipation of heat emanated by the second controller 201. In an embodiment, a portion of a front face 202f of the holder 202a includes one or more wiring harness-holding members 406. The one or more wiring harness-holding members 406 enable routing of the first wiring harness through the pre-defined space 203.

[00059] In an embodiment, the second controller 201 is mounted to the holder 202a through a multi-point mounting. The multi-point mounting includes mounting of one of a side surfaces and a top surface of the second controller 201. The side surface 201s is configured with one or more mounting members 202m and the top surface 201t is configured with the one or more mounting members 202m. The multi-point mounting provides stable mounting of the second controller 201 and thereby improving the efficiency of the second controller 201.

[00060] Althcough the subject matter has been described in considerable detail with reference to certain embodiments thereof, other embodiments are possible. It is to be understood that the aspects of the embodiments are not necessarily limited to the features described herein.

Reference Numerals:

100 vehicle

105 frame assembly

106 front frame

107 main frame member

108 pair of rear frames

108a right-side rear frame

108b left-side rear frame

109 step through portion

110 handlebar assembly

111 central frame member

115 front wheel

120 one or more front suspensions

130 rear wheel

135 muffler

140 seat assembly

145 floor board

150 toggle link

155 front fender

165 headlight

170 front panel

171 leg shield

172 rear panel assembly

201 second controller

201b bottom face

202 one or more auxiliary energy sources

202l lower face

202a holder

202m one or more mounting members

202f front face

203 predefined space

302 control unit

401 power source

401a sub-power source

404 one or more fins

405 power source

406 one or more wiring harness holding members

LM longitudinal axis

TR transverse axis

I/We claim:

1. A straddle-type vehicle (100) comprising:

a frame assembly (105) including a front frame (106), a main frame (107) extending rearwardly from said front frame (106), and a pair of rear frames (108) extending rearwardly from said main frame (107);

a power source (405) configured to propel said vehicle (100);

a control unit (302) configured to control said power source (405);

a second controller (201) configured to control said power source (405), and

one or more auxiliary energy source (202) disposed in front of said front frame (106),

wherein, at least one of said control unit (302) and said second controller (201) being disposed in front of said one or more auxiliary power source (202).

2. The straddle-type vehicle as claimed in claim 1, wherein a bottom face (201b) of said second controller (201) being disposed above a lower face (202l) of said one or more auxiliary energy source (202), wherein a pre-defined space (203) being formed below said bottom face (201b).

3. The straddle-type vehicle (100) as claimed in claim 1 or claim 2, wherein said control unit (302) being disposed on a right-side rear frame (108a) of said pair of rear frames (108).

4. The straddle-type vehicle (100) as claimed in claim 1 or claim 2, wherein said control unit (302) being disposed on a left-side rear frame (108b) of said pair of rear frames (108).

5. A straddle-type vehicle (100) comprising:

a frame assembly (105) including a front frame (106), a main frame (107) extending rearwardly from said front frame (106), and a pair of rear frames (108) extending rearwardly from said main frame (107);

a power source (405) configured to propel said vehicle (100);

a control unit (302) configured to control said power source (405);

a second controller (201) configured to control said power source (405), and

one or more auxiliary energy source (202)

wherein, said second controller (201), said control unit (302), and said one or more auxiliary energy source (202) are disposed along a longitudinal axis (LM), said longitudinal axis (LM) is passing through lateral centre of said vehicle (100) in a front-rear direction when viewed from a plan view.

6. The straddle-type vehicle (100) as claimed in claim 1 or claim 5, wherein said power source (405) is functionally coupled to a sub-power source (401a), said sub-power source (401a) is a part of said power source (405), wherein said sub-power source (401a) is configured to be controlled by said second controller (201).

7. The straddle-type vehicle (100) as claimed in claim 1 or claim 5, wherein said second controller (201) being disposed in front of said front frame (106) and mounted to said front frame (106).

8. The straddle-type vehicle (100) as claimed in claim 1 or claim 5, wherein said power source (405) being disposed in a rear portion of said vehicle (100) and below said pair of rear frames (108), said control unit (302) being disposed along said longitudinal axis (LM) such that the control unit (302) being placed above said power source (405) when viewed from a plan view.

9. The straddle-type vehicle (100) as claimed in claim 1 or claim 5, wherein said control unit (302) being disposed on any one rear frame of said pair of rear frames (108), wherein a transverse axis (TR) intersects substantially orthogonally between said control unit (302) and said power source (405).

10. The straddle-type vehicle (100) as claimed in claim 1 or claim 5, wherein said sub-driving source (401a) being an integrated starter-generator (ISG) and said second controller (201) being an ISG controller.

11. The straddle-type vehicle (100) as claimed in claim 1 or 5, wherein said second controller (201) is disposed in front of and mounted to said front

frame (106) and said one or more auxiliary energy source (202) being disposed in front of said second controller (201).

12. The straddle-type vehicle (100) as claimed in claim 1 or 5, wherein said second controller (201) includes a side surface (201s) configured with one or more mounting members (202m) and a top surface (201t) is configured with the one or more mounting members (202m), said side surface (201s) and said top surface (201t) are configured to be mounted to said holder (202a) by means of said one or more mounting members (202m).
13. The straddle-type vehicle (100) as claimed in claim 1 or 5, wherein said vehicle includes a first wiring harness (401), a second wiring harness (303) and a third wiring harness (402).
14. The straddle-type vehicle (100) as claimed in claim 1 or 5, wherein said second controller (201) includes one or more fins (404).
15. The straddle-type vehicle (100) as claimed in claim 1 or 5, wherein said second controller (201) includes one or more couplers (304), said one or more couples (304) are disposed on any one of a right side and a left side of said second controller (201), wherein said control unit (302) is disposed on a same side in said vehicle, as that of said one or more couplers (304).
16. The straddle-type vehicle (100) as claimed in claim 15, wherein control unit 302 is disposed on the same side as that of the first wiring harness 401, the second wiring harness 303, and the third wiring harness 402.
17. The straddle-type vehicle (100) as claimed in claim 1 or 5, wherein said control unit (302) and said second controller (201) receive power from one or more auxiliary energy source (202), said one or more auxiliary energy source (202) being disposed in front of said front frame (106) and mounted to said front frame (106).
18. The straddle-type vehicle (100) as claimed in claim 17, wherein said one or more auxiliary energy source (202) being supported by a holder (202a), said holder (202a) being mounted to said front frame (106), said holder (202a) is configured to support a portion of said second controller (201).

19. The straddle-type vehicle (100) as claimed in claim 17, wherein said second controller (201) being disposed in front of said auxiliary energy source (202), wherein a bottom face (201b) of said second controller (201) being disposed above a lower face (202l) of said auxiliary energy source (202), wherein a pre-defined space (203) being formed below said bottom face (201b).

20. The straddle-type vehicle (100) as claimed in claim 17, wherein said pre-defined space (203) being formed by said bottom face (201b) and a portion of a front face (202f) of said holder (202a), said portion of a front face (202f) being disposed below said bottom face (201b), wherein said pre-defined space (203) being configured to facilitate routing of a first wiring harness (401) therethrough.

21. The straddle-type vehicle (100) as claimed in claim 20, wherein said lower portion of said front face (202f) includes one or more wiring harness-holding members (406), said one or more wiring harness-holding members (406) enable routing of said first wiring harness (401) therethrough.

Dated this 12th day of November 2020

(Digitally singed by)
Chandan Chavan
Head IP
TVS Motor Company Limited

ABSTRACT

A STRADDLE-TYPE VEHICLE

The present subject matter relates to a straddle-type vehicle. More particularly but not exclusively, to vehicle layout of the straddle-type vehicle for packaging of one or more control units in the vehicle. The power source (405) to propel the vehicle (100) and a control unit (302) configured to control the power source (405) are disposed along a transverse axis (TR). A second controller (201) is configured to control a sub-power source (401a). The second controller (201) and the power source (405) are disposed along a longitudinal axis (LM) in a front rear direction when viewed from a plan view.

<To be published with Figure 2a, 2b>