



(51) International Patent Classification:

B60K 37/00 (2006.01) B62D 25/14 (2006.01)

(21) International Application Number:

PCT/IN2021/050692

(22) International Filing Date:

16 July 2021 (16.07.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

202041030744 18 July 2020 (18.07.2020) IN

(71) Applicant: TVS MOTOR COMPANY LIMITED

[IN/IN]; "Chaitanya", No. 12 Khader Nawaz Khan Road, Nungambakkam, Chennai 600 006 (IN).

(72) Inventors: VINOTH, Murugan; TVS Motor Company

Limited, "Chaitanya", No. 12 Khader Nawaz Khan Road, Nungambakkam, Chennai 600 006 (IN). RAMAKRISHNAN, Kuppusamy; TVS Motor Company Limited, "Chaitanya", No. 12 Khader Nawaz Khan Road, Nungambakkam, Chennai 600 006 (IN). DHINAGAR, Samraj Jabez; TVS Motor Company Limited, "Chaitanya", No. 12 Khader Nawaz Khan Road, Nungambakkam, Chennai 600 006 (IN). VENKATESAN, Palanisamy; TVS Motor Company Limited, "Chaitanya", No. 12 Khader Nawaz Khan Road,

Nungambakkam, Chennai 600 006 (IN). EZHILARASAN, Subramanian; TVS Motor Company Limited, "Chaitanya", No. 12 Khader Nawaz Khan Road, Nungambakkam, Chennai 600 006 (IN). CHETHAN, Gangaiah; TVS Motor Company Limited, "Chaitanya", No. 12 Khader Nawaz Khan Road, Nungambakkam, Chennai 600 006 (IN).

(81) Designated States (unless otherwise indicated, for every

kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every

kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,

(54) Title: A DASHBOARD ASSEMBLY

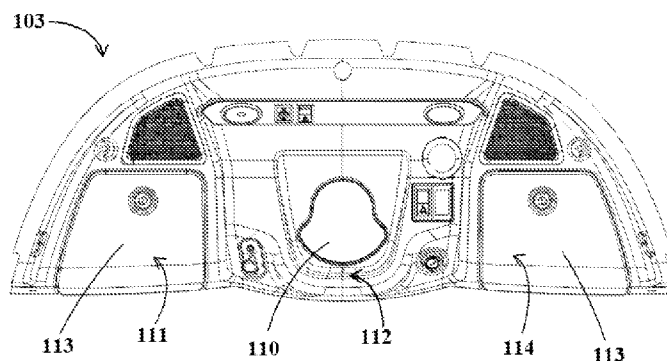


Fig. 2(a)

(57) Abstract: This is to provide an ergonomic dashboard which has secure, safe and accessible fool proof layout of the switches to be operated without any discomfort and cognitive stress to the rider. The dashboard assembly in a vehicle have a centrally located cavity for positioning a steering assembly of the vehicle and at least one first switch for operating the vehicle in a forward mode, a reverse mode and a neutral mode, disposed on a first surface of a second region proximal to the cavity, at least one second switch for operating the vehicle in a power mode and an economy mode, and a third switch which controls the start and stop of the vehicle disposed on the first surface of the second region, proximal to the at least second switch. The switches thus disposed helps in reduction in wiring and also prevents the entry of water into the switches.

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to the identity of the inventor (Rule 4.17(i))*
- *of inventorship (Rule 4.17(iv))*

Published:

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

A DASHBOARD ASSEMBLY

TECHNICAL FIELD

[0001] The present subject matter relates generally to a vehicle, more particularly but not exclusively relates to a dashboard assembly of the vehicle.

BACKGROUND

5 [0002] Generally, in a vehicle, there are numerous functions to be performed for operating the vehicle. To perform these functions, all parts of the vehicle are connected either mechanically, electrically or a combination of both. In order to actuate the parts related to the electrical system or a combination of both mechanical and electrical systems, suitable actuating means are provided. Typically, these
10 actuation means are one or more switches provided on the vehicle, disposed in an easily accessible location so that the user of the vehicle can actuate the desired parts while running as well as starting the vehicle.

[0003] Generally, the switches are located in a steering means/handle bar of the vehicle, to ensure ease of operation while riding the vehicle. With development of
15 technology and increase in features provided in the vehicle, number of operations and related switches have also increased. Further the challenge is made complicated especially when the powertrain of the vehicle has at least one electric powertrain included. In case of an electric powertrain, in known art a sudden jerk is perceived in form of forward thrust when the vehicle ignition is switched ON which is
20 undesirable. Also, for a vehicle configured with a simple forward and reverse movement based on suitable selection from the user, in the scenario of need to actuate multiple number of switches, there is a cognitive overload on the user to process multiple information. This problem is further aggravated for a novice rider. Accidental actuation of torque transfer at idle condition of the vehicle by having a
25 powertrain and its transmission in a forward or reverse engagement can lead to very unsafe riding situation both the rider, occupants as well as the people in the vicinity of the vehicle potentially jeopardising safety. Therefore, there is a need to design a simple yet ergonomic layout of the switch console on a dashboard of a vehicle which is safe and fool proof to avoid accidental actuation of the switches.

Additionally, there is a need to have a control system and method for fool proof starting of the vehicle to avoid any safety risk from accidental actuation of the switches.

5 BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The details are described with reference to an embodiment of a Three-wheeled autorickshaw along with the accompanying figures. The same numbers are used throughout the drawings to reference similar features and components. Figure 1 exemplarily illustrates a schematic plan view of a three-wheeled vehicle.

10 [0005] Figure 2 (a) exemplarily illustrates a magnified top view of the dashboard assembly

[0006] Figure 2 (b) exemplarily illustrates a magnified plan view of the dashboard assembly in the three-wheeled vehicle.

15 [0007] Figure 3 exemplarily illustrates an exploded view of the plurality of switches disposed on the dashboard assembly.

[0008] Figure 4 exemplarily illustrates a flowchart explaining the controlling function of a controller to actuate the switches.

DETAILED DESCRIPTION

20

[0001] Accommodating all required switches on the steering means, particularly on the handle bar of a three or two wheeled vehicle results in reduction of size of the switches. As a result, the steering means becomes crowded with lot of small switches. This leads in discomfort to the rider in accessing the switches while riding the vehicle. In addition, the switches on the steering means are not differentiable easily due to small size and increasing number of switches at a particular location may result in an unintended activation of a switch. Thus, there exists a need to design an ergonomic interface console or dashboard for a vehicle so that the one or more switches are disposed securely and are easily available to the rider for the operation of the vehicle without any accidental actuation which can result in an accident. Also, there is a need of a control mechanism to avoid the unintended

25

30

actuation of the switches on the dashboard of the vehicle. The main objective of the present subject matter is to provide ergonomic dashboard which has secure, safe and accessible fool proof layout of the switches to be operated without any discomfort and cognitive stress to the rider. The present subject matter is described
5 using an exemplary electric three-wheeled autorickshaw type vehicle. However, the invention is applicable to any two wheeled, three wheeled, or four wheeled vehicles in general including motorcycles, scooters, autorickshaws etc. In the present subject matter, a dashboard assembly is provided in a vehicle. As per an aspect of the present invention, the dashboard assembly includes a substantially vertical surface
10 and a substantially horizontal surface, the substantially horizontal surface inclinedly extends from a lower end of the substantially vertical surface. The substantially horizontal surface is configured with a first region, a second region, and a third region. The second region is disposed between the first region and the third region and the second region of said dashboard assembly being disposed in a lower plane
15 from the first and the third region. The first region, the second region, and the third region being partially enclosed by the substantially vertical surface forming a semi-circular shape.

[0002] As per an aspect of the present subject matter, the vehicle includes an electric power train.

20 **[0003]** As per an aspect of the present subject matter, the second region includes a front wall, at least one side wall, and a first surface. The front wall includes at least one audio system, at least one control switch, and at least one charging port. The first surface includes a centre cavity and an at least one switch slot. The centre cavity is configured to accommodate at least a portion of a steering assembly of the
25 three-wheeled vehicle.

[0004] As per another aspect of the present subject matter, the first surface having the centre cavity and the at least one switch slot is configured to accommodate one or more switches on the dashboard assembly of the three-wheeled vehicle.

30 **[0005]** As per another embodiment of the present subject matter, an at least one storage space is disposed in a raised portion adjacent to the second region of the dashboard assembly. The raised portion is configured to form the first region and

the third region of the dashboard assembly of the vehicle. The depth of the at least one storage space is at least equal to the depth of the second region. In another embodiment, the depth of the at least one storage space extends beyond the depth of the second region.

5 [0006] As per another embodiment of the present subject matter, the one or more switches include one or more of a toggle switch, a rocker switch, and an electronic switch and a push pull switch.

[0007] Another objective of the present subject matter is to provide a control system for a vehicle configured with a method of controlling stating of the vehicle
10 using a controller, the vehicle having an ergonomic dashboard assembly, provided with one or more switches communicatively connected to the controller, the one or more switches comprising at least a first switch, and at least a third switch. The controller receives a position input from the at least a third switch which is one of the start position and a stop position. The controller receives a position input from
15 the ignition key based on the received input from the at least a third switch, where the position input from the ignition key is one of the ON or OFF positions. The controller further receives a position input from the ignition key, where the position input from the at least one first switch is one of a forward position, a reverse position and a neutral position, and the controller controls one of connection and
20 disconnection of the power supply to a mobility unit of the vehicle for changing the state of the vehicle to one of mobile or immobile state based on the received position of the at least one first switch and the transition between the position inputs. Thus, the dashboard and switch console layout as described herewith achieves a simple yet ergonomic and cognitive stress-free design for use by a rider which is also safe
25 by being fool proof to avoid accidental wrong actuation of switches.

[0008] As per an aspect of the present subject matter, the third switch is in the start position, the ignition key is in ON position, the controller receives, a position input of at least a second switch, where the position input is one of an economy mode and a power mode.

[0009] As per an aspect of the present subject matter, the third switch is in the start position, the ignition key is in OFF position, the controller disconnects the power supply of the mobility unit of the vehicle.

5 [00010] As per an aspect of the present subject matter, the third switch is in the start position, the ignition key is in ON position, the controller receives a position input of the at least a first switch is one of the forward position and the reverse position, said controller disconnects the power supply of the mobility unit of the vehicle.

10 [00011] As per an aspect of the present subject matter, the third switch is in the start position, the ignition key is in ON position, the controller receives a position input of the at least a first switch is in neutral position, said controller connects the power supply of the mobility unit of the vehicle. The present subject matter is further described with reference to an embodiment in a three wheeled vehicle along with the accompanying figures. It should be noted that the description and figures
15 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.

20 [00012] **Fig. 1** exemplarily illustrates a schematic rear perspective view of a three-wheeled vehicle **100** with roof and rear cover of the three-wheeled vehicle **100** omitted for clarity. A frame structure of the three-wheeled vehicle **100** depicts a frame assembly (not shown) having a front compartment (**F**), a partition (**P**), and a rear compartment (**R**). The front compartment (**F**) includes a front frame portion
25 **101** having a windshield **102**. The vehicle **100** includes the frame assembly, a dashboard assembly **103**, a windshield **102**, a handle bar assembly **104**, a steering assembly **105**, a rider seat assembly **106**, a back rest **107**, a leg operated throttle control **108**, and a passenger seat assembly **109**. The dashboard **103** assembly is placed inside the front compartment (**F**) where the windshield **102** terminates at the
30 middle portion of the front compartment (**F**) in downward direction and extends from said middle portion, substantially horizontal within the front compartment (**F**).

The handle bar assembly **104** is mounted with the steering assembly **105** which passes through the centre of the dashboard assembly **103**. The rider seat assembly **106** is provided in the front compartment (**F**) placed opposing to the dashboard assembly **103**. The back rest **107** for the rider of the vehicle **100** is disposed in a vertical direction on the partition (**P**) provided between the front compartment (**F**) and the rear compartment (**R**) for resting the back of the rider of the vehicle **100**. The leg operated throttle control **108** is provided on the right-hand side of the vehicle **100** in front direction in proximity of the steering assembly **105** to give throttle to the vehicle **100**. The rear compartment (**R**) includes the passenger seat assembly **109** for carrying the passengers in the vehicle **100**.

[00013] Fig. 2 (a) exemplarily illustrates a top view of the dashboard assembly **103** and Fig. 2 (b) exemplarily illustrates a perspective view of the dashboard assembly **103** in the three-wheeled vehicle **100**. The dashboard assembly **103** mounted in the front compartment (**F**) of the vehicle **100** includes a substantially vertical surface **103 (a)**, a substantially horizontal surface **103 (b)**, a first region **111**, a second region **112**, a third region **114**, a centre cavity **110**, and an at least one storage space **113**. The dashboard assembly **103** includes the substantially vertical surface **103 (a)** and the substantially horizontal surface **103 (b)**, the substantially horizontal surface **103 (b)** inclinedly extends from a lower end of the substantially vertical surface **103 (a)**. The substantially horizontal surface **103 (b)** includes the first region **111**, the second region **112**, and the third region **114**. The second region **112** is disposed between the first region **111** and the third region **114** and the second region **112** of said dashboard assembly **103** is disposed in a lower plane from the first region **111** and the third region **114**. The first region **111**, the second region **112**, and the third region **114** are covered by the substantially vertical surface **103(a)** at its peripheral sides having semi-circular shape forming the dashboard assembly **103**. The second region **112** includes a front wall **112(a)**, at least one side wall **112 (b)**, and a first surface **112 (c)**. The front wall **112 (a)** includes at least one music system **119** (shown inf Fig 3), at least one control switch **120** (shown inf Fig 3), and at least one charging port **121** (shown inf Fig 3). The first surface **112 (c)** includes a centre cavity **110** and an at least one switch slot **122** (shown inf Fig 3). The centre cavity

110 located in the center of the second region 112 of the dashboard assembly 103 is configured to accommodate at least a portion of the steering assembly (not shown) of the vehicle 100. The dashboard assembly 103 includes at least one storage space 113 which is disposed adjacent to the second region 112 of the dashboard assembly 103. In the present embodiment, the storage space 113 is disposed on one or more of the left and right sides of the second region 112, thereby enhancing the volumes of storage spaces 113. However, the location of storage spaces 113 can be different in different configuration. In addition to this, this storage spaces 113 can be used for different purposes. The depth of the storage space 113 is at least equal to the depth of the second region 112. However, in an additional embodiment the depth of the storage space 113 may extend beyond the depth of the second region 112 covering all the space available in the vehicle 100 in downward direction.

[00014] Fig. 3 exemplarily illustrates an exploded perspective view of the plurality of switches disposed on the dashboard assembly 103. In the present embodiment, the plurality of switches includes an at least one first switch 115, an at least one second switch 116, and an at least one third switch 117 in the second region 112 present on the dashboard assembly 103. The plurality of switches may include more number of switches on the dashboard assembly 103. The at least one first switch 115 operates the vehicle 100 in a forward mode, a reverse mode, and a neutral mode placed in the second region 112 proximal to the centre cavity 110. The at least one first switch 115 is a toggle switch in the present embodiment. The toggle switch facilitates the ease of actuation of the vehicle 100 in a forward position, a reverse, and a neutral position due to its actuation mechanism. Said at least one first switch disposed in the second region 112 proximal to the centre cavity 110 at the left-hand side of the second region 112 in the at least one switch slot 122. As per an embodiment, the at least one first switch 115 makes an acute angle in the range of 15 to 35 degrees with respect to the line of sight of the rider of the vehicle 100 and the substantially horizontal surface 103 (b) of the dashboard assembly 103. This orientation of said at least one first switch 115 makes it easier to view and

differentiate the position of the toggle switch to determine the position of the vehicle 100.

[00015] The at least one second switch 116 for operating the vehicle 100 in a power mode and an economy mode is placed in the second region 112 proximal to the centre cavity 110 at the right-hand side of the second region 112. The at least one second switch 116 is a rocker switch in the present embodiment. The rocker switch facilitates the ease of actuation of the vehicle 100 in the power mode and the economy mode due to its actuation mechanism. Said at least one second switch 116 disposed in the second region 112 proximal to the centre cavity 110 at the right-hand side of the second region 112 in the at least one switch slot 122. As per an embodiment, the at least one second switch 116 makes an acute angle in the range of 10 to 20 degrees with respect to the line of sight of the rider of the vehicle 100 and substantially horizontal surface 103(b) of the dashboard assembly 103. This orientation of said at least second switch 116 makes it easier to view and differentiate the position of the rocker switch to determine the position of the vehicle 100 as shown in fig.3.

[00016] The at least one third switch 117 controls the start and the stop of the vehicle 100 and is placed in the second region 112 proximal to the centre cavity 110. The at least one third switch 117 is a push-pull type switch in the present embodiment. The push-pull switch facilitates the ease of actuation of the vehicle 100 at the time of vehicle start and stop. Also, in case of emergency situations, where the vehicle 100 is required to stop immediately, actuation of push and pull is easier than all other switches. Said at least one third switch 117 disposed in the second region 112 proximal to the centre cavity 110 at the right-hand side of the second region 112 in the at least one switch slot 122. As per an embodiment, the at least one third switch 117 makes an acute angle in the range of 10 to 20 degrees with respect to the line of sight of the rider of the vehicle 100 and substantially horizontal surface 103(b) of the dashboard assembly 103. This orientation of said at least third switch 117 makes it easier to view and differentiate from other parts on the dashboard assembly 103. The at least one third switch 117 is placed in the right-hand side of the second region 112 and in front of the handle bar 104 so that

it is easily reachable by the rider of the vehicle **100** as shown in fig 3. Also, the placement of the at least one third switch **117** in the second region **112** results in the reduction of power cable connected to the switch. In addition to that, the connection of the at least one third switch **117** to the mechanical or electronic parts
 5 done through the power cable follows a substantially downward straight path and as a result there is no undesirable bending of power cable. This configuration also reduces the power losses in the cables. The shape of the push pull type of switch can be a rectangular, triangular, square, or circular in shape. In this embodiment an ignition key **118** is disposed in the second region **112**, proximal to the at least one
 10 second switch **116** as shown in fig.3. In this embodiment, the front wall includes at least one audio system **119** for playing audio, at least one control switch **120**, at least one charging port **121** for charging electronic devices or any other electrical device, and one or more speakers **123**.

[00017] Fig.4 exemplarily illustrates a flowchart explaining the controlling
 15 function of a controller (not shown) to actuate the switches, while in operation. The controller performs the controlling of a power supply to a mobility unit of the vehicle **100** based on different position inputs and modes of the vehicle **100**. The controller receives a position input from the third switch **117**, which may be at the start position or the stop position, to identify whether the third switch **117** is in start
 20 position or stop position at step **202**. The controller then at step **204** receives the position input from the ignition key **118**, based on the received position input from the third switch **117**, where the position input from the ignition key **118** is one of the ON position or the OFF position at step **204**. If the ignition key is OFF, then at step **206**, the vehicle remains in immobile condition. If the ignition key is ON, then
 25 at step **208**, the controller further receives the position input of the at least one first switch **115** based on the received position input from the ignition key **118**, where the position input from the at least one first switch **115** is one of a forward position, a reverse position and a neutral position. If the position input from the at least one first switch **115** is not available, then at step **206**, the vehicle remains immobile.
 30 However, if the first switch **115** input is available, then this input is fed to the controller at step **212**. In parallel, at step **210**, a traction battery input is fed to the

controller. Further in parallel, at step 214, the controller receives input about whether the second switch is in economy or power mode. Based on these above inputs, at step 216, the controller controls one of connection and disconnection of the power supply to the mobility unit at step 216 of the vehicle 100 for making the vehicle 100 either mobile or immobile at step 218 thereby achieving a safe and fool proof starting control system for a vehicle. When the third switch 117 is in the start position at step 202, the ignition key 118 is in ON position at step 204 and, where position input from the at least one first switch 115 is in the forward position at step 208, the controller disconnects the power supply of the mobility unit and makes the vehicle 100 immobile at step 206. When the third switch 117 is in the start position at step 202, the ignition key 118 is in ON position at step 204 and, where position input from the at least one first switch 115 is in the reverse position at step 208, the controller disconnects the power supply of the mobility unit and makes the vehicle 100 immobile at step 206. When the third switch 117 is in the start position at step 202, the ignition key 118 is in ON position at step 204 and, where position input from the at least one first switch 115 is in a neutral position, the controller connects the power supply of the mobility unit at step 216 and makes the vehicle 100 mobile at step 218.

[00018] In another scenario, when said third switch 117 is in the start position at step 202, the ignition key 118 is in OFF position at step 204, the controller disconnects the power supply of the mobility unit and disconnects all the vehicle 100 components at step 206. If the third switch 117 is in the start position at step 202, an auxiliary controller (not shown) turns ON other electrical loads in the vehicle 100. When the third switch 117 is in the start position at step 202, the ignition key 118 is in ON position at step 204, the position input from the at least one second switch 116 is one of an economy mode and a power mode at step 214 to operate the vehicle 100 in economy mode or power mode based on the requirement of the rider of the vehicle 100, then the controller connects the power supply to the mobility unit at step 216 to enable vehicle mobility at step 218. In the present embodiment, the power supply is a battery shown at step 210 and the mobility unit is a motor shown at step 216. Many other improvements and

modifications may be incorporated herein without deviating from the scope of the invention.

List of Reference numerals:

- 5
- 100: Three-wheeled vehicle
- 101: Front frame portion of 100
- 102: windshield of 101
- 103: Dashboard assembly of 100
- 10 103(a): Substantially vertical surface of 103
- 103(b): Substantially horizontal surface of 103
- 104: Handlebar of 100
- 105: Steering assembly of 100
- 106: Rider seat assembly of 100
- 15 107: Backrest of 106
- 108: Leg operated throttle control of 100
- 109: Passenger seat assembly of 100
- F: Front compartment of 100
- R: Rear compartment of 100
- 20 P: Partition of 100
- 110: Centre cavity in 103
- 111: First region of 103
- 112: Second region of 103
- 112 (a): Front wall of 112
- 25 112 (b): at least one side wall of 112

- 112 (c): first surface of 112
- 113: Storage spaces of 103
- 114: Third region of 103
- 115: First switch on 103
- 5 116: Second switch on 103
- 117: Third switch on 103
- 118: Ignition key of 100
- 119: Music system on 112 (a)
- 120: At least one control switch on 112 (a)
- 10 121: charging port on 112 (a)
- 122: switch slot for 115, 116, and 117
- 123: Speakers on 103

We claim:

1. A dashboard assembly **(103)** in a vehicle **(100)** comprising:
 - a substantially vertical surface **(103 (a))** and a substantially horizontal surface **(103 (b))**, the substantially horizontal surface **(103 (b))** inclinedly extending from a lower end of the substantially vertical surface **(103 (a))**;
 - said substantially horizontal surface **(103 (b))** including a first region **(111)**, a second region **(112)**, and a third region **(114)**;
 - said second region **(112)** is disposed between the first region **(111)** and the third region **(114)**;
 - said second region **(112)** of said dashboard assembly **(103)** being disposed in a lower plane from said first region **(111)** and said third region **(114)**; and
 - said first region **(111)**, the second region **(112)**, and the third region **(114)** being partially peripherally enclosed by the substantially vertical surface **(103 (a))** forming a substantially semi-circular shape.
2. The dashboard assembly **(103)** in the vehicle **(100)** as claimed in claim 1 wherein, the vehicle includes an electric power train.
3. The dashboard assembly **(103)** as claimed in claim 1 wherein, said second region **(112)** includes a front wall **(112(a))**, at least one side wall **(112(b))**, and a first surface **(112(c))**.
4. The dashboard assembly **(103)** as claimed in claim 1 wherein, the front wall **(112(a))** includes at least one audio system **(119)**, at least one control switch **(120)**, and at least one charging port **(120)**.
5. The dashboard assembly **(103)** as claimed in claim 1 wherein, the first surface **(112(c))** includes a centre cavity **(110)** and an at least one switch slot **(122)**.
6. The dashboard assembly **(103)** as claimed in claim 4 wherein, the centre cavity **(110)** is configured to accommodate at least a portion of a steering assembly **(105)**.

7. The dashboard assembly **(103)** as claimed in claim 4 wherein, the at least one switch slot **(122)** is configured to accommodate one or more switches.
8. The dashboard assembly **(103)** as claimed in claim 1 wherein, an at least one storage space **(113)** is disposed in a raised portion adjacent to said second region **(112)**.
9. The dashboard assembly **(103)** as claimed in claim 7, wherein a depth of the at least one storage space **(113)** is at least equal to the depth of the second region **(112)**.
10. The dashboard assembly **(103)** as claimed in claim 6, wherein the one or more switches include one or more of a toggle switch, a rocker switch, and an electronic switch and a push pull switch.
11. A control system for a vehicle **(100)** configured with a method of controlling starting of said vehicle **(100)** using a controller, the vehicle **(100)** comprising a dashboard assembly **(103)**, provided with one or more switches communicatively connected to the controller, the one or more switches comprising at least a first switch, and at least a third switch, the method comprising steps of:
- receiving by the controller (step **202**), a position input from the at least a third switch **(117)**, wherein the position input from the at least a third switch **(117)** being one of a start position and a stop position.
- receiving by the controller, (step **204**) a position input from an ignition key **(118)**, based on the received position input from the at least a third switch **(117)**, wherein the position input from the ignition key **(118)** is one of an ON position or an OFF position.
- receiving by the controller (step **208**), a position input of the at least a first switch **(115)** based on the received position input from the ignition key **(118)**, wherein the position input from the at least a first switch **(115)** is one of a forward position, a reverse position and a neutral position; and

controlling one of connection and disconnection of the power supply to a mobility unit of the vehicle (100) based on the received position of the first switch (115).

- 5 12. The control system for a vehicle (100) as claimed in claim 11, wherein said third switch (117) is in the start position, the ignition key (118) is in ON position, the controller (step 214) receives, a position input of at least a second switch (116), wherein the position input is one of an economy mode and a power mode.
- 10 13. The control system for a vehicle (100) as claimed in claim 11, wherein, said third switch (117) is in the start position, the ignition key (118) is in OFF position, the controller (step 206) disconnects the power supply of the mobility unit of the vehicle (100).
- 15 14. The control system for a vehicle (100) as claimed in claim 11, wherein, said third switch (117) is in the start position, the ignition key (118) is in ON position, the controller (step 208) receives a position input of the at least a first switch (115) is one of the forward position and the reverse position, said controller (step 206) disconnects the power supply of the mobility unit of the vehicle (100).
- 20 15. The control system for a vehicle (100) as claimed in claim 11, wherein, said third switch (117) is in the start position, the ignition key (118) is in ON position, the controller (step 208) receives a position input of the at least a first switch (115) is in neutral position, said controller (step 212) connects the power supply of the mobility unit of the vehicle (100).

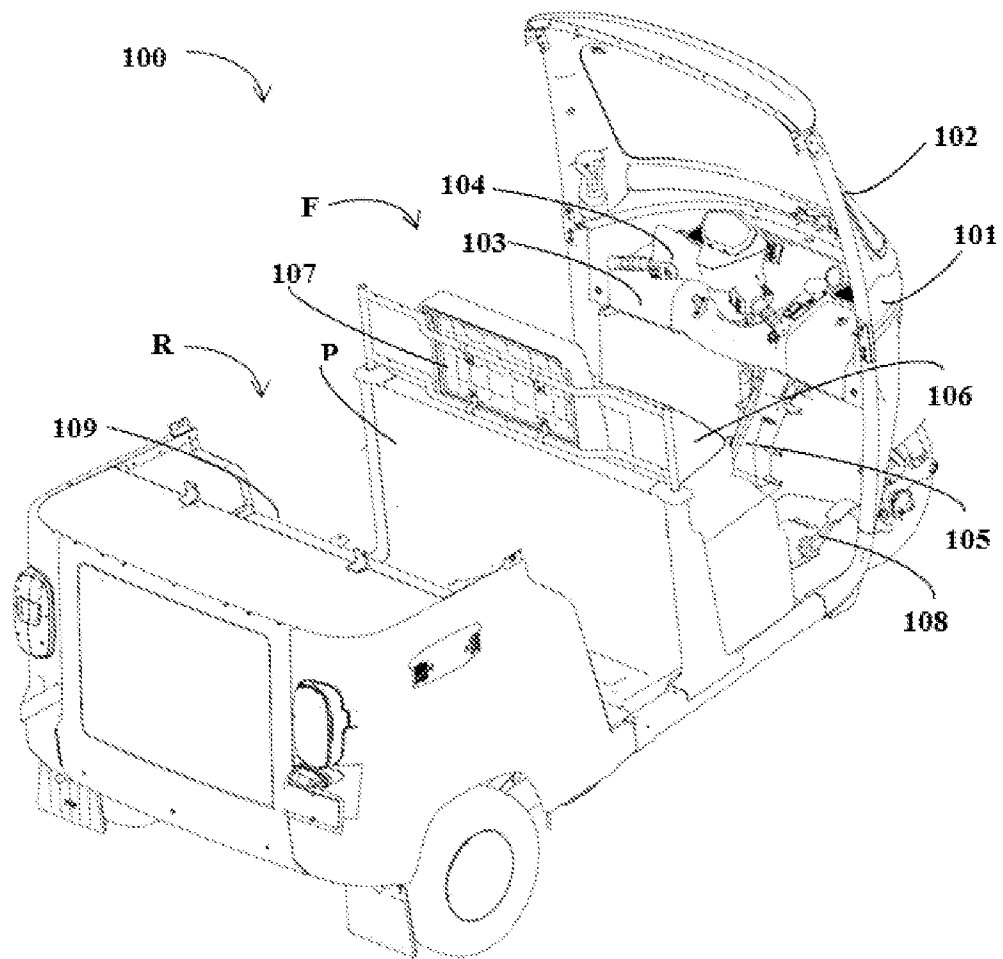


Fig. 1

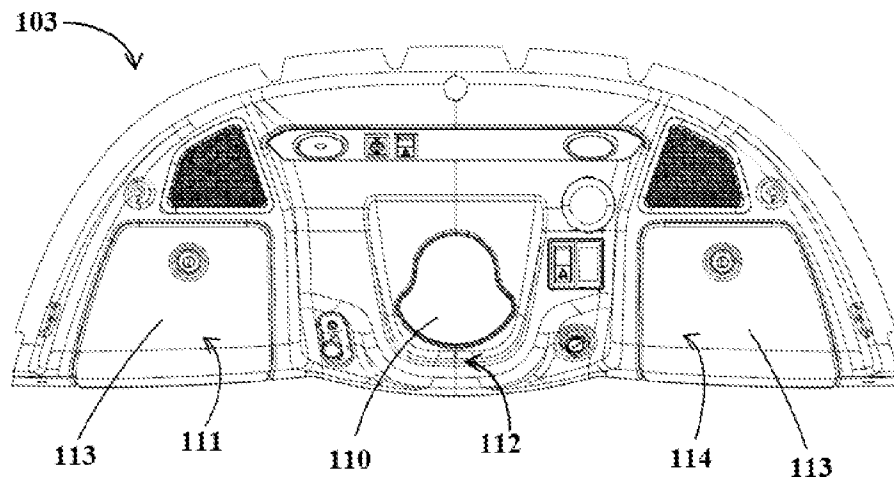


Fig. 2(a)

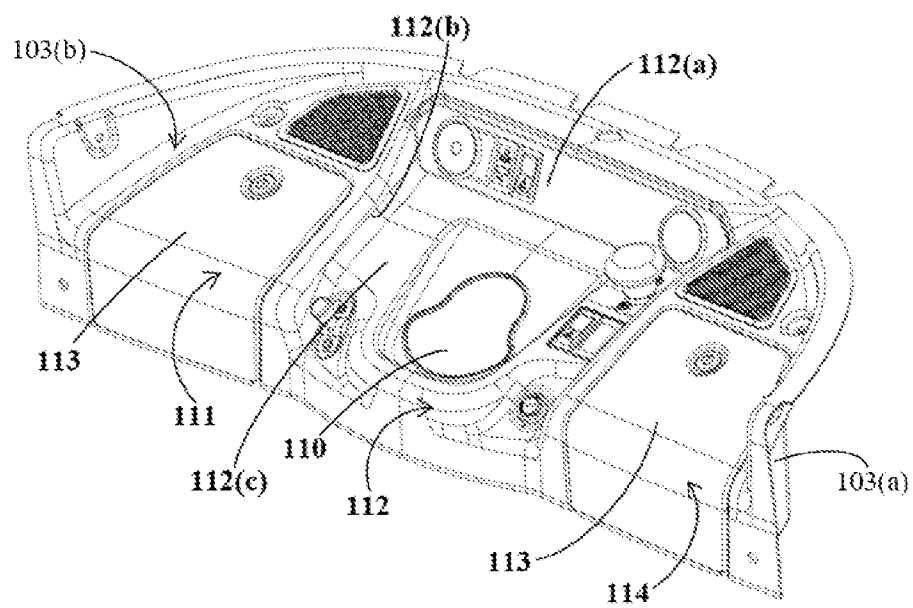


Fig. 2(b)

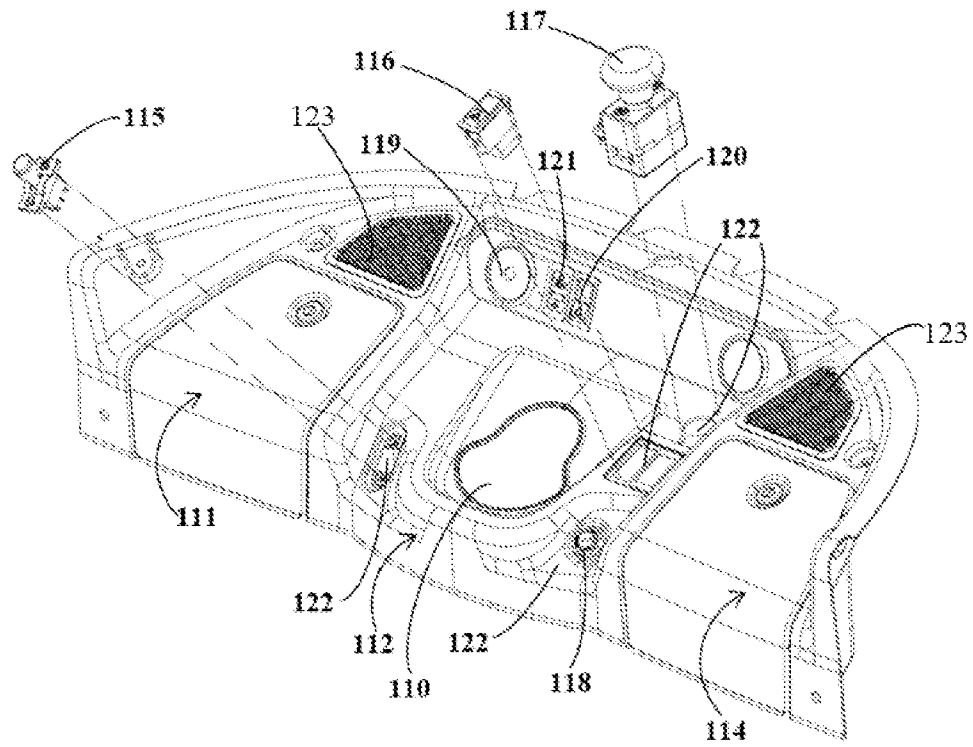


Fig. 3

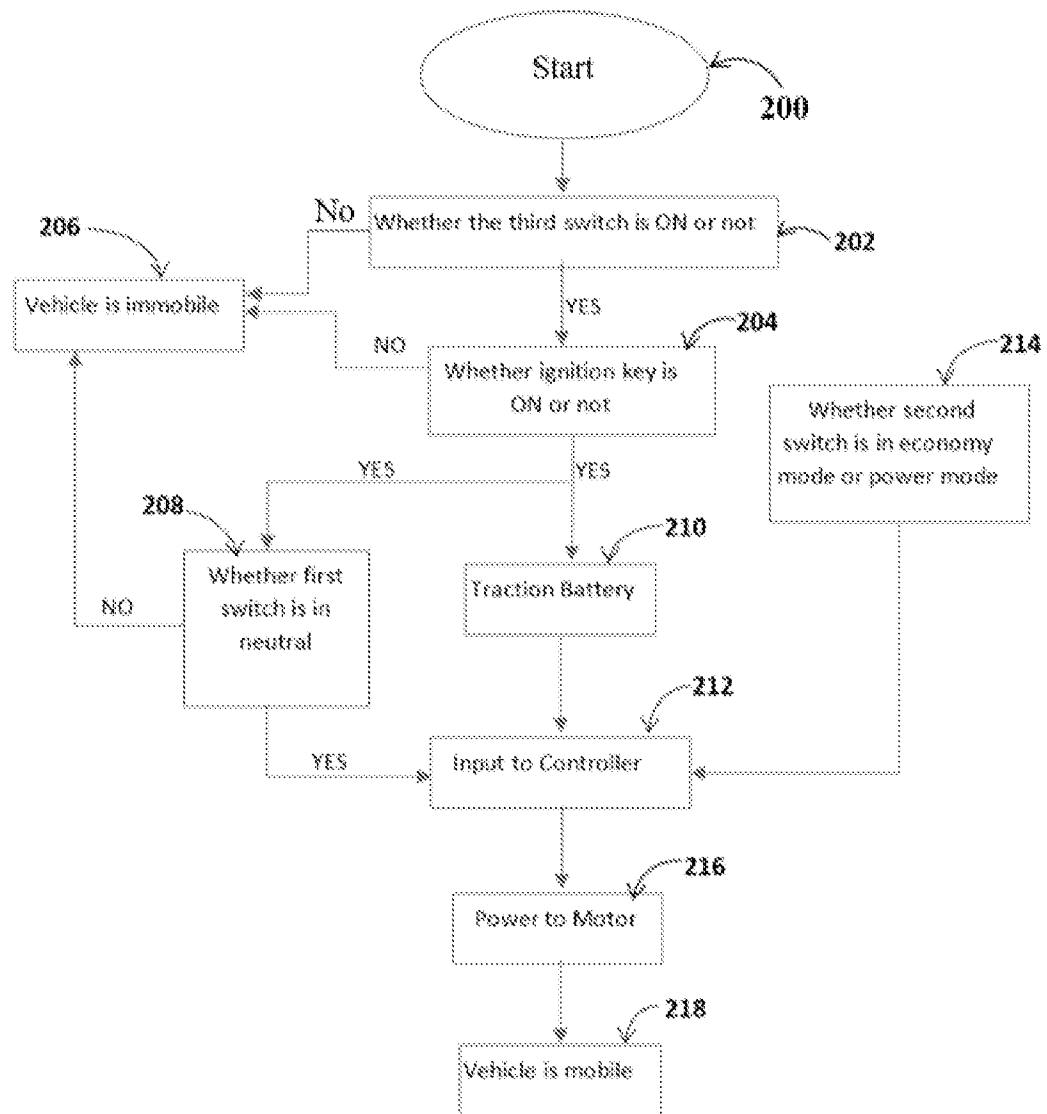


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN2021/050692

A. CLASSIFICATION OF SUBJECT MATTER
B60K37/00, B62D25/14 Version=2021.01

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B60K, B62D

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)

PatSeer, IPO Internal Database, Google, YouTube

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TVS King Duramax LD BS4 Liquid Cooled LPG Auto Rickshaw Specs Review, YouTube [online][video], Rajeev Pillai, 2 MARCH, 2020 [retrieved on 26.10.2021], Retrieved from URL: https://www.youtube.com/watch?v=yI7nBKV9Rgo Whole Video	1-10
Y	Whole Video	11-15
Y	IN 155/CHE/2014 A (TVS MOTOR CO LTD) 31 AUGUST, 2016 (31.08.2016) & NO FAMILY Abstract; Claims 1, 3, 14; Page 7, Lines 9-25	11-15
Y	LI, Jiashun et al. Design of Dual MCU Vehicle Control Unit Based on Electric Vehicles to Respond to Control Failure. IOP Conf. Series: Earth and Environmental Science 512 (2020) 012132. DOI:10.1088/1755-1315/512/1/012132. [online][retrieved on 26.10.2021], retrieved from [https://www.proquest.com/docview/2555857009] 30 JUNE, 2020 (30.06.2020) Figures 1, 2	11-15

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

* Special categories of cited documents:

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

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

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

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

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search

08-11-2021

Date of mailing of the international search report

08-11-2021

Name and mailing address of the ISA/

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

Authorized officer

Dwaipayan Mahato

Telephone No. +91-1125300200

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN2021/050692

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Unity of invention:

The requirements of unity of invention have not been met as there are group of inventions which are not so linked as to form a single general inventive concept.

I. Claims 1-10 are directed to a dashboard assembly design of a vehicle .

II. Claims 11-15 are directed to a control system for a vehicle configured with a method of controlling the starting of said vehicle using a controller. It discloses a method of controlling the starting

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

Continuation of Observations where unity of invention is lacking (Box III)

of vehicle in a sequential manner.

Independent claims 1 and 11 do not appear to be linked by any common or corresponding special technical features, nor are their features somehow interrelated. Claims 1 and 11 therefore define two different inventions not linked by a single general inventive concept. The application, hence does not meet the requirements of unity of invention.