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(54) Title: VEHICLE COMPRISING A COMPARTMENT, AN OPERATING DEVICE AND AN ELECTRONIC CONTROL UNIT

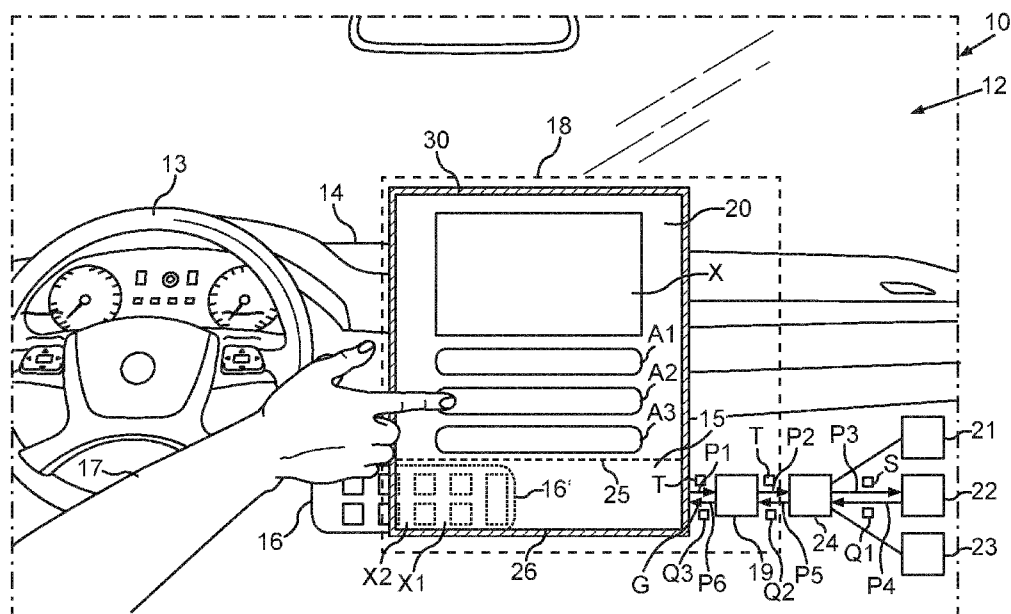


Fig. 1

(57) Abstract: The invention is concerned with a vehicle (10) comprising a compartment (15), wherein the compartment (15) is designed to be loaded by an object (16) and an operating device (18) comprising a user-interface (20), wherein the user-interface (20) is designed to output at least one output signal (Q3) on a part (X) of the user-interface (20). The operating device (18) is designed to cover the compartment (15). The compartment (15) comprises a sensing unit (27), wherein the sensing unit (27) is designed to detect a presence of the object (16) when at least a part (16') of the object (16) is loaded into the compartment (15) and the operating device (18) comprises a control circuitry (19), wherein the control circuitry (19) is designed to display a digital image (X1) of the object (16) on a part (X2) of the user-interface (20).



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5 Vehicle comprising a compartment, an operating device and an electronic
control unit

DESCRIPTION:

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The invention is concerned with a vehicle comprising a compartment and an operating device. The invention also provides an operating device comprising a user-interface. Finally, the invention is also concerned with an electronic control unit for an operating device in a vehicle.

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A vehicle nowadays usually comprises a display panel or a touchscreen which is generally of a large size and is placed on and/or integrated in a dashboard of the vehicle. This enables a user or a driver of the vehicle to communicate with and/or operate other devices in the vehicle through the display panel or the touchscreen. The user or the driver can communicate with the other devices through the display panel or the dashboard by means of touch or voice signals. However, other computing devices such as a smartphone of the user are usually loaded at a different location in the vehicle in a loading chamber. The smartphone of the user is usually connected to the display panel or the touchscreen by means of a wireless connection or a wired connection in such a manner that a display of the smartphone is displayed on the display panel or the touchscreen in a different form, so that the user can communicate with his smartphone through the display panel or the touchscreen. However, the form of the display of the smartphone on the display panel or the touchscreen is much different to the original display of the smartphone. Furthermore, the user often forgets to remove or pick up his smartphone from the loading chamber at the time of exit from the vehicle, since the smartphone is loaded at a different location in the vehicle.

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Document DE 10 2015 002 306 A1 discloses a stowage device for an interior of a motor vehicle with at least one storage compartment for receiving objects, and with at least one cover associated with the storage compartment. By means of the at least one cover, the storage compartment is at least partially closable, wherein the cover has at least one partial area with an adjust-

able light transmission. The document further discloses a method for monitoring at least one storage compartment arranged in an interior of a motor vehicle. However, the document does not disclose any virtual representation of a smartphone on the at least one cover. However, a display of the display
5 of a smart phone in the at least one cover is not disclosed.

Document DE 10 2014 209 983 A1 discloses an operator control device in a vehicle and a mobile unit, wherein the mobile unit is controlled by the operator control device by means of a proximity sensor. In this case, a user surface of the mobile unit is transmitted to a display of the operator control device by means of an interface. At said display, the user surface can control
10 the mobile unit by means of a proximity sensor, wherein a processing device of the mobile unit can be designed such that specific operator control elements are displayed on the user surface on an enlarged scale. However, a
15 storage device to store the mobile unit is not disclosed.

Document DE 10 2014 014 412 A1 discloses a motor vehicle, comprising an operating device with a touchscreen having luminous pixel elements, and a control device which is designed for this purpose, in a first operating mode, to
20 display the graphical user-interface on the touchscreen by means of the pixel elements and, depending on a touch signal of the touchscreen to control at least one device of the motor vehicle other than the operating device by means of a control signal. However, a storage device to store the mobile unit
is not disclosed.

25 It is an object of the present invention to provide a vehicle for storing an object and enabling a visualization of the object on a user-interface. The object is accomplished by the subject-matter of the independent claims. Advantageous developments with convenient and non-trivial further embodiments of
30 the invention are specified in the following description, the dependent claims and the figures.

The invention provides a vehicle comprising a compartment, wherein the compartment is designed to be loaded by an object. For example, the compartment can be a part of a dashboard of the vehicle. The compartment may
35 be located and/or integrated in the dashboard in such a manner, that it is located at a reachable distance from a user, who can be a driver of the vehicle sitting on a front vehicle seat. This enables the user to load or place the object into the compartment while driving the vehicle manually and/or at the

same time be able to reach the object the compartment by means of his hand while driving. The vehicle further comprises an operating device comprising a user-interface, wherein the user-interface is designed to output at least one output signal on a part of the user-interface. The operating device
5 may be in the form of a touchscreen and the user-interface may be in the form of a graphical user-interface (GUI) of the touchscreen. The user-interface, that is, for example, the graphical user-interface of the operating device, may comprise a plurality of pixel elements. By the term pixel element, it is meant each pixel of a pixel matrix. By means of the pixel elements, a
10 digital image can be formed or displayed. The digital image may comprise logos and/or apps, which can be displayed on the user-interface.

According to the invention, the operating device is arranged in front of the compartment and is designed to cover the compartment. In other words, the
15 operating device may function as a lid or a door of the compartment. This is of advantage, because this enables a protection and/or safety of the object which is being loaded or is loaded or placed into the compartment in the vehicle. Moreover, it further enables to preserve space in the vehicle, since the object is placed inside the compartment, instead being placed at separate
20 predefined location in the vehicle, which in turn could lead to an occupation of space in the vehicle.

Furthermore, the compartment comprises a sensing unit, wherein the sensing unit is designed to detect a presence of the object when at least a part of
25 the object is loaded into the compartment. Moreover, the operating device comprises a control circuitry, wherein the control circuitry is designed to display a digital image of the object on a part of the user-interface. In other words, when the object is being loaded or is loaded or placed into the compartment or at least a part of the object is loaded or placed into the compartment,
30 then the presence of the object is detected by means of the sensing unit and a detection signal is sent to the control circuitry of the operating device. Upon receiving the detection signal from the sensing unit the control circuitry is activated, which in turn can activate a camera attached to the control circuitry. The camera can capture an image of the loaded object or a part
35 of the loaded object into the compartment and the image in form of a digital image can be transferred from the control circuitry to a part of the user-interface. This is of advantage, because this enables the display of the digital image of the object loaded into the compartment on the part of the user-interface. Hence, on one side the object can be placed in the compartment

which enables the safety of the object and at the same time enables to save space in the vehicle and on the other side, the object can be viewed by means of the digital image of the object on a part of the user-interface. Furthermore, the object can be a smartphone of the user. In this case, it is further thinkable that a login profile of the user of the smartphone, can be stored in the control circuitry. When the smartphone is loaded into the compartment, then the login profile of the user can be identified by the control circuitry and a display content of a display panel of the smartphone of the user is displayed on a part of the user-interface in form of a digital image.

The invention also comprises embodiments that provide features which effort additional technical advantages.

In one embodiment, the operating device may be designed to output a pick-up message of the object loaded in the compartment on the user-interface, wherein for triggering the pick-up message, an electronic control unit of the vehicle may be designed to send a remove signal to the control circuitry when a stoppage of the vehicle and/or an opening of a driver's door of the vehicle is detected. In other words, a corresponding notification signal may be sent to the electronic control unit from a corresponding vehicle unit. The corresponding vehicle unit may be an engine unit which may send a notification signal notifying the stoppage of the engine, which may mean that the stoppage of the vehicle has occurred. Furthermore, the corresponding vehicle unit may be a locking unit of the driver's door of the vehicle, which may send a notification signal notifying the opening of the driver's door of the vehicle. The driver's door may be a door of the vehicle, next to which the driver of the vehicle may be seated inside the vehicle, while driving the vehicle. After receiving the corresponding notification signal from the corresponding vehicle unit, the electronic control unit may send the remove signal to the control circuitry of the operating device. This in turn may trigger the pick-up message on the user-interface of the operating device. For example, the pick-up message may be in a form of a display message ("Please pick up your object from the compartment") and/or in a form of an audio signal and/or in a form of a graphic symbol. This is of advantage, because this enables the user to pick up the object at the time of his exit from the vehicle, since the user-interface of the operating device lies within a field of view of the user while driving and/or stopping the vehicle. Hence, a reminder of a picking up of the object from the compartment is delivered to the user at the time of his exit from the vehicle.

In one embodiment, the object may be a mobile computing device, wherein the sensing unit may detect the object by reading a radio-frequency identification code (RFID) on the object and/or by means of a radio signal. The mobile computing device may be a smartphone, a tablet computer, a navigation device or a laptop. By the term mobile computing unit, it may be meant that the mobile computing unit may not be a device that is integrated in the vehicle, rather it may be an electronic unit or an electronic device which can be carried by the user into and out of the vehicle. When the mobile computing device may be loaded into the compartment of the vehicle, the sensing unit may detect the object by reading the RFID code and/or by means of a radio signal. This is of advantage, because this may enable the user to load or place, for example, his smartphone into the compartment, which may be at a distance close to a steering wheel of the vehicle and hence, can be reached by his hand while driving the vehicle.

In one embodiment, the sensing unit may be designed to send a connection signal to the control circuitry, wherein a display content of the object may be mapped onto the digital image of the object on the part of the user-interface of the operating device. In other words, the sensing unit can send the connection signal to the control circuitry by means of a USB port, a CAN-bus, WLAN (Wireless Local Area Network), a Bluetooth, a MirrorLink or a wired interface. Hence, by means of the connection signal, the sensing unit can enable a transfer of information from the object, that is the mobile computing device, for example, a smartphone, to the control circuitry of the operating device. This in turn may enable the formation of a digital image of the object on a part of the user-interface, such that the digital image may correspond to the size and dimension of a display panel of the smartphone on one side and that the display content of the object or the display content of the display panel of the smartphone may be mapped onto the digital image of the object or display panel of the smartphone on the part of the user-interface of the operating device on the other side. The digital image of the object or the display panel of the smartphone can comprise a multitude of apps or logos, which may be also displayed on the display panel of the smartphone. The apps or logos may be designed to activate different functionalities of the object, when they receive an input from a user, for example, by means of touch. In other words a digital replica of the display panel of the smartphone is generated as the digital image of the display panel of the smartphone on the part of the user-interface of the operating device. This is of advantage, because

the digital image of the object, for example, the display panel of the smartphone, on the part of the user-interface can operate and/or be operated as the display of the object or the display panel of the smartphone itself.

5 In one embodiment, the part of the user-interface displaying the digital image of the object may be designed to receive an object input signal and forward the object input signal to an object control unit of the object. In other words, an object input signal corresponding to an activation of a particular functionality of an app on the digital image of the object can be received by the user-
10 interface displaying the digital image of the object. The received object input signal by the user-interface can be transmitted to the control circuitry of the operating device, which in turn may forward or transmit the object input signal to the object control unit of the object. This can enable the activation of the required functionality of the corresponding app of the object. This is of
15 advantage, because it can enable a usage of the object by the user and/or a communication of the user with the object through the user-interface of operating device.

In one embodiment, the control circuitry may be designed to receive an object output signal from the object and/or transmit the received object output
20 signal from the object to the user-interface and/or to an output device of the vehicle, for example, an infotainment unit. In other words, the object output control unit of the object may send an object output signal to the control circuitry of the operating device. The control circuitry may then transmit the received object output signal from the object control unit of the object to the
25 user-interface of the operating device. The output of the object output signal may be controlled by the control circuitry, in such a way that the object output signal may be outputted in form of a visual signal and/or an audio signal and/or a haptic signal. Henceforth, a communication with the object by the
30 user by means of the operating device can be realized.

In one embodiment, the compartment may comprise a charging unit, wherein the charging unit may be designed to electrically charge the object loaded in the compartment. The electrically charging of the object may be by means of
35 conduction or induction. This is of advantage, because this can enable the object in the compartment to be charged electrically during the time in which the object is loaded in the compartment, that is during the time period in which the user or the driver of the vehicle is driving the vehicle and/or is present inside the vehicle.

The invention also comprises an operating device for a vehicle. The operating device comprises a user-interface, wherein the user-interface is designed to output at least one output signal on a part of the user-interface. The output
5 can be in form of a video signal and/or an audio signal and/or a haptic signal. Furthermore, the operating device comprises a control circuitry, wherein the control circuitry is designed to receive a detection signal from a sensing unit of the vehicle, wherein the detection signal detects a presence of an object. Furthermore, the control circuitry is designed to display a digital image of the
10 object on a part of the user-interface.

In one embodiment the user-interface may be designed to receive an input signal on a part of the user-interface and the control circuitry may be designed to forward the input signal to an output device of the vehicle and/or to
15 an electronic control unit of the vehicle. This is of advantage, because it can enable the operating device to receive an input signal, for example, from a user in a vehicle, in order to communicate with another device in the vehicle.

The invention also comprises various combinations of the features of the described embodiments, if not stated otherwise.
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In the following an exemplary implementation of the invention is described.

The figures show:

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Fig. 1 a schematic illustration of an embodiment of a vehicle comprising a compartment and an operating device; and

Fig. 2 a schematic illustration of a side view of an embodiment of a
30 vehicle comprising an operating device and a compartment.

The embodiment explained in the following is a preferred embodiment of the invention. However, in the embodiment, the described components of the embodiment each represent individual features of the invention which are to
35 be considered independently of each other and which each develop the invention also independently of each other and thereby are also to be regarded as a component of the invention in individual manner or in another than the shown combination. Furthermore, the described embodiment can also be supplemented by further features of the invention already described.

In the figures identical reference signs indicate elements that provide the same function.

5 Fig. 1 shows a schematic illustration of a vehicle 10, wherein the vehicle may be a personal vehicle which may be either driven manually or may be a self-driving vehicle. Furthermore, the vehicle may be a semi-autonomous vehicle. In the Fig. 1, a part of an interior cabin 12 of the vehicle 10 is depicted from a perspective of a view of a user, who can be the driver (not shown in figures)
10 of the vehicle 10. Furthermore, a steering wheel 13 which can be used to maneuver the vehicle 10 by the user and a dashboard 14 of the vehicle 10 are depicted. The vehicle comprises a compartment 15. The compartment 15 can be in form of a hollow structure, which is designed in a region close to the steering wheel 13 in the dashboard 14 of the vehicle 10. The compartment 15 is designed to be loaded by an object 16. The location of the compartment 15 is chosen in such a manner that the compartment 15 is easily reachable by a hand 17 of the user. The object 16, that can be loaded in the compartment 15, can be a mobile computing device, for example a smartphone, a laptop or a think pad.

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The vehicle 10 further comprises an operating device 18, for example a touchscreen. The touchscreen may be an integral part of the vehicle 10 which can be arranged in front of the dashboard 14 by means of a handling arrangement (not shown in the figure). The operating device 18 can further
25 comprise a user-interface 20 and a casing 30. The user-interface 20 may be a graphical user-interface (GUI), which may comprise a plurality of pixel elements. The pixel elements of the user-interface 20 can be excited by means of a control circuitry 19 of the operating device 18. The control circuitry 19 may comprise a graphic card G, by means of which the control circuitry 19
30 can excite corresponding pixel elements of the user-interface 20, in such a manner that at least one predetermined color may be radiated by the corresponding pixel element of the user-interface 20. Hence, the control circuitry 19 can control the formation of different forms of digital images on the user-interface 20. The different forms of digital images can be in the form of apps or logos corresponding to different functionalities of different devices of the vehicle 10. The different devices of the vehicle 10 are shown in Fig. 1 and Fig. 2 may be a locking unit 21, an infotainment unit 22 and a navigation unit 23. An app A1 may correspond to the locking unit 21, an app A2 may corre-

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spond to the infotainment unit 22 and an app A3 may correspond to the navigation unit 23.

5 The user-interface 20 may be designed to receive an input signal T on a part of the user-interface 20. The input signal T can be provided by the user, wherein the user can touch the corresponding part of the user-interface 20, that is a corresponding app A1, A2 or A3. For example as shown in Fig. 1, the user may provide the input signal T by touching the app A2 with a finger of his hand 17. Hence, the user can be able to communicate with the infotainment unit 22, which corresponds to the app A2 on the user-interface 20. It is further thinkable that the input signal T can be provided by the user by means of a voice input signal and/or by means of a gesture, in which the gesture may be captured by a camera and/or a proximity sensor (which are not shown in the figures). The input signal T provided by the user on the user-interface 20 can be transmitted or forwarded to the control circuitry 19, as shown by a path P1. The control circuitry 19 can transmit or forward the input signal T to an electronic control unit 24 of the vehicle 10, as shown by a path P2.

20 The electronic control unit 24 is designed to send an activation signal S to the corresponding device, which in this case is the infotainment unit 22 in the vehicle 10, dependent on the input signal T. The transmission of the activation signal S from the electronic control unit 24 to the infotainment unit 22 can be enabled by means of a wireless connection or a wired connection, as shown by a path P3. Depending on the activation signal S the infotainment unit 22 sends an output signal Q1 to the electronic control unit 24, as shown by a path P4. The electronic control unit 24 can receive the output signal Q1 and can transform the output signal Q1 to an output signal Q2 and then, transmit the output signal Q2 to the control circuitry 19, as shown by the path P5. The control circuitry 19 can transform the received output signal Q2 to an output signal Q3 and transmit the output signal Q3 to the user-interface 20, as shown by a path P6. The output signal Q3 can be a visual signal and/or an audio signal and/or a haptic signal. In other words, the electronic control unit 24 is designed to receive the output signal Q1 and transmit the received output signal Q1 from the infotainment unit 22 in the vehicle 10 to the user-interface 20 of the operating device 18. The user-interface 20 is designed to output the output signal Q3 on a part X of the user-interface 20.

The operating device 18 is arranged in front of the compartment 15 and is designed to cover the compartment 15. In Fig. 1, the compartment 15 lies behind the operating device 18, in other words the compartment 15 is hidden behind the operating device 18. This is represented by means of a region
5 bounded by a dashed line 25 and a lower side 26 of the casing 30 of the operating device 18. A depiction of the compartment 15 in Fig. 1 is made for the sake of understandability. However, the compartment 15 which is covered by the operating device 18 may be seen in a side view of the operating device 18 and the compartment 15, as shown in Fig. 2.

10 The compartment 15 can comprise a sensing unit 27, wherein the sensing unit 27 is designed to detect a presence of the object 16 when at least a part 16' of the object 16 is loaded or placed into the compartment 15. The sensing unit 27 detects the object 16 by reading an a radio-frequency identification
15 code R (RFID code) on the object 16 and/or by means of a radio signal. It is further thinkable, that the sensing unit 27 may detect the object 16 by means of a camera (not shown in the figure) which may be integrated in the compartment 15. The sensing unit 27 upon detection of the presence of the object 16 can send a detection signal D to the control circuitry 19 of the operating device 18. The control circuitry 19 is designed to receive the detection
20 signal D from the sensing unit 27 of the vehicle 10, wherein the detection signal D indicates a presence of the object 16 in the compartment 15. The detection signal D can be transmitted from the sensing unit 27 to the control circuitry by means of a wireless connection and/or a wired connection, as
25 shown by a path P7.

Upon receiving the detection signal D, the control circuitry 19 may excite a plurality of the pixel elements of the user-interface 20, which in turn may display a digital image X1 of the object 16 on a part X2 of the user-interface 20.
30 The digital image X1 can be obtained by means of a camera (not shown in figure) which may be incorporated either in the compartment 15 or may be a part of the operating device 18. A Display content X3 of the object 16 can be mapped on to the digital image X1 of the object 16 on the part X2 of the user-interface 20 of the operating device 18.

35 Furthermore, the mapping of the display content X3 of the object 16, which in this case is the smartphone, onto the digital image X1 of the object 16 on the part X2 of the user-interface 20, can be realized by means of a USB connection and/or a Bluetooth and/or a MirrorLink technology. It is further thinkable,

that a login profile of a user of the smartphone, that is the object 16, can be stored in the control circuitry 19, such that when the smartphone, that is the object 16, is loaded into the compartment 15, then the login profile of the user is identified by the control circuitry 19 and the display content X3 of the object 16, that is the smartphone of the user, is mapped onto the digital image X1 of the object 16.

The part X2 of the user-interface 20 displaying the digital image X1 of the object 16 is designed to receive an object input signal T1, for example by means of a touch signal. For example, the touch signal is provided by the user by touching the corresponding app A4 on the digital image X1 by means of the finger of his hand 17. The app A4 on the digital image X1 can correspond to the app 29 of the display content X3 of the object 16. Similarly, an app A5 on the digital image X1 of the object 16 can correspond to an app 34 of the display content X3 of the object 16. Similarly, a digital object output panel X5 on the digital image X1 may correspond to an object output panel 31 of the display content X3 of the object 16. When the finger of the hand 17 of the user touches the app A4, an object input signal T1 is sent to the control circuitry 19, as shown by a path P8. In other words, the part X2 of the user-interface 20 displaying the digital image X1 of the object 16 is designed to receive the object input signal T1 and transmit or forward the object input signal T1 to the control circuitry 19, which in turn transmits or forwards the object input signal T1 to an object control unit 32 of the object 16, as shown by a path P9. Hence, the user can communicate with the object 16 by means of the user-interface 20 by sending the object input signal T1 by touching the app A4 in order to communicate with the app 29 of the object 16.

After receiving the object input signal T1, the object control unit 32 sends an object output signal Q4, which may correspond to an output from an app 29 of the object 16, to the control circuitry 19 via a path P10. After receiving the object output signal Q4, the control circuitry 19 can transmit or forward the object output signal Q4 to the user-interface 20 via a path P11. An output corresponding to the object output signal Q4 can be outputted on the region X5 of the digital image X1 of the object 16. The output outputted on the region X5 corresponds to the output which would mirror the output displayed on the object output panel 31 of the display content X3 of the object 16. For the sake of understandability, a pattern B depicted on the region X5 and the object output panel 31, is shown to be identical, this is to represent that the output on the digital image X1 is identical to the output which would have

been displayed on the object output panel 31 of the display content X3 of the object 16 upon the application or activation of the app 29 of the object 16. It is thinkable, that the digital image X1 of the object 16 can be scaled to a different length scale, as it can be performed by an ordinary skilled person in the related field.

The compartment 15 comprises a charging unit 33, wherein the charging unit 33 can be designed to electrically charge the loaded object 16 in the compartment 15. The charging of the object 16 can occur by means of induction and/or conduction.

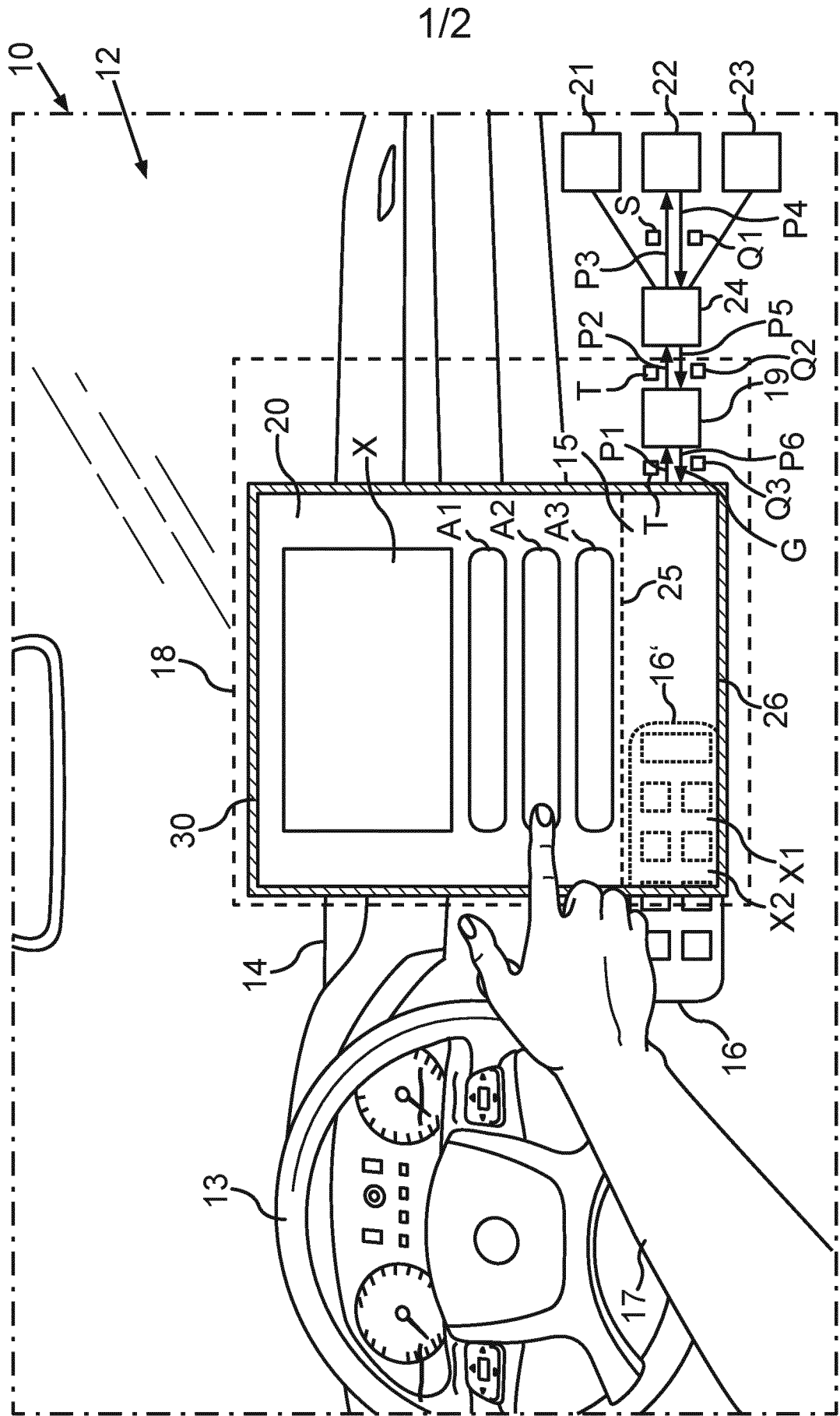
The operating device 18 can be designed to output a pick-up message of the loaded object 16 in the compartment 15 on the user-interface 20. For example, upon a stoppage of the vehicle 10, the locking unit 21 can send a remove signal Z1 to the electronic control unit 24 via a path P12. The electronic control unit 24 can receive the remove signal Z1 from the locking unit 21 and can transmit or forward the remove signal Z1 to the control circuitry 19 via a path P13. The control circuitry 19 can transform the remove signal Z1 to an output remove signal Z2 and can transmits the output remove signal Z2 to the user-interface 20. The output remove signal Z2 can be outputted on the output panel X as an output Y. The output Y can be in form of the pick-up message which can be outputted as a visual signal and/or an audio signal and/or a haptic signal. Furthermore, the remove signal Z1 can be sent from an engine unit and/or other units or devices of the vehicle 10 which could detect a stoppage of the vehicle 10 and/or an opening of a driver's door of the vehicle 10.

Overall, the example shows how the storing of the object 16 and enabling a visualization of the object 16 on a user-interface 20 of the operating device 18 in a vehicle 10 can be obtained.

CLAIMS:

1. A vehicle (10) comprising:
- a compartment (15), wherein the compartment (15) is designed to be loaded by an object (16); and
 - an operating device (18) comprising a user-interface (20), wherein the user-interface (20) is designed to output at least one output signal (Q3) on a part (X) of the user-interface (20),
- characterized in that
- the operating device (18) is arranged in front of the compartment (15) and is designed to cover the compartment (15);
 - the compartment (15) comprises a sensing unit (27), wherein the sensing unit (27) is designed to detect a presence of the object (16) when at least a part (16') of the object (16) is loaded into the compartment (15); and
 - the operating device (18) comprises a control circuitry (19), wherein the control circuitry (19) is designed to display a digital image (X1) of the object (16) on a part (X2) of the user-interface (20).
2. A vehicle (10) according to claim 1, wherein the operating device (18) is designed to output a pick-up message of the object (16) loaded in the compartment (15) on the user-interface (20), wherein for triggering the pick-up message, an electronic control unit (24) of the vehicle (10) is designed to send a remove signal (Z1) to the control circuitry (19) when a stoppage of the vehicle (10) and/or an opening of a driver's door of the vehicle (10) is detected.
3. A vehicle (10) according to claim 1 or 2, wherein the object (16) is a mobile computing device, wherein the sensing unit (27) detects the object (16) by reading a radio-frequency identification code (R) on the object (16) and/or by means of a radio signal.
4. A vehicle (10) according any of the preceding claims, wherein the sensing unit (27) is designed to send a connection signal (C) to the control circuitry (19), wherein a display content (X3) of the object (16) is mapped onto the digital image (X1) of the object (16) on the part (X2) of the user-interface (20) of the operating device (18).

5. A vehicle (10) according to any of the preceding claims, wherein the part (X2) of the user-interface (20) displaying the digital image (X1) of the object (16) is designed to receive an object input signal (T1) and forward the object input signal (T1) to an object control unit (32) of the object (16).
5
6. A vehicle (10) according to any of the preceding claims, wherein the control circuitry (19) is designed to receive an object output signal (Q4) from the object (16) and/or transmit the received object output signal (Q4) from the object (16) to the user-interface (20) and/or to an output device of the vehicle (10).
10
7. A vehicle (10) according to any of the preceding claims, wherein the compartment (15) comprises a charging unit (33), wherein the charging unit (33) is designed to electrically charge the object (16) loaded in the compartment (15).
15
8. An operating device (18) for a vehicle (10) according to any of the preceding claims, wherein the operating device (18) is designed to cover a compartment (15) of the vehicle (10), comprising:
20
- a user-interface (20), wherein the user-interface (20) is designed to output at least one output signal (Q3) on a part (X) of the user-interface (20); and
 - a control circuitry (19), wherein the control circuitry (19) is designed to receive a detection signal (D) from a sensing unit (27) of the vehicle (10), wherein the detection signal (D) indicates a presence of an object (16) and to display a digital image (X1) of the object (16) on a part (X2) of the user-interface (20).
25
9. An operating device (18) according to claim 8, wherein the user-interface (20) is designed to receive an input signal (T) on a part of the user-interface (20) and the control circuitry (19) is designed to forward the input signal (T) to an output device of the vehicle (10) and/or to an electronic control unit (24) of the vehicle (10).
30
- 35



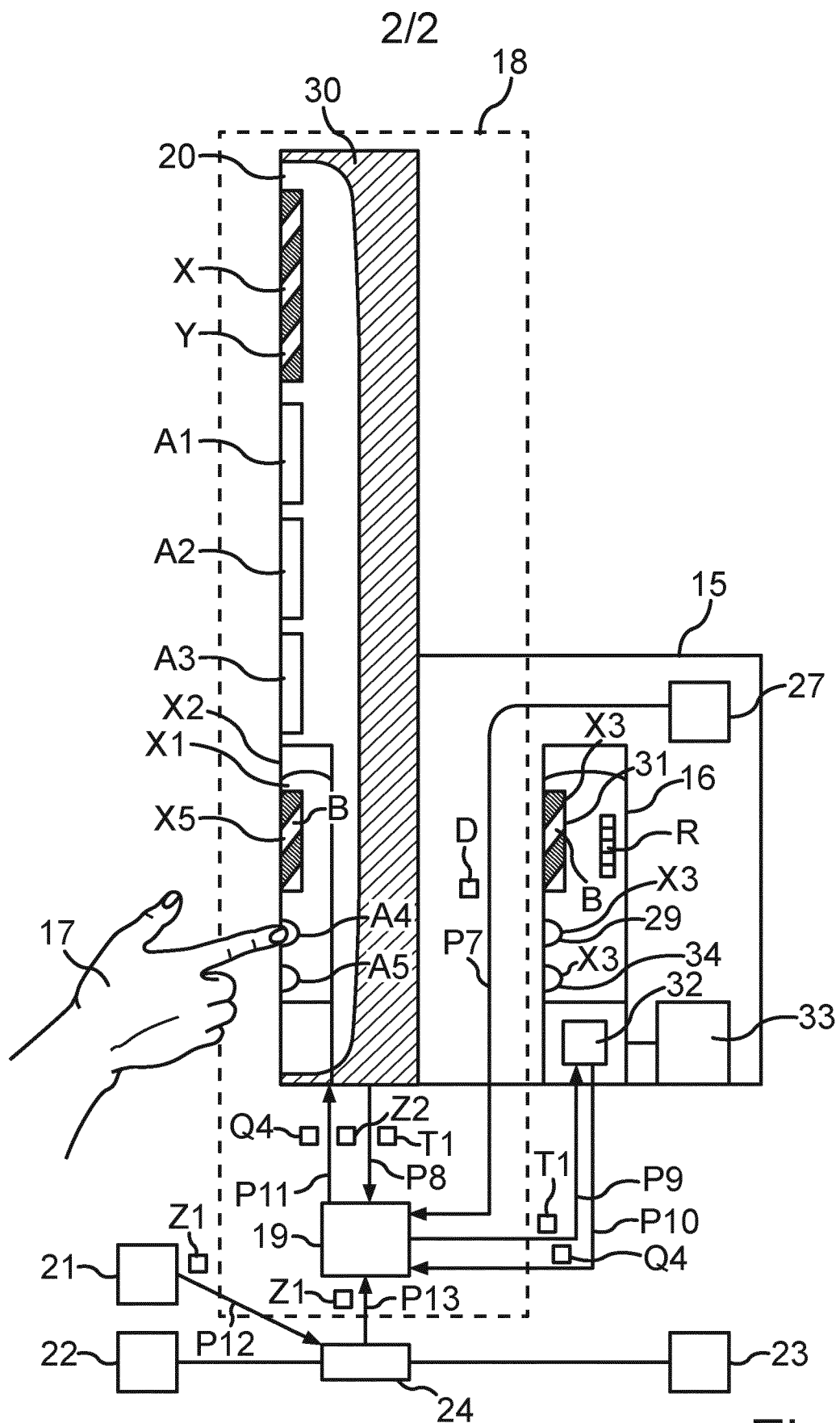


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2019/085341

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B60K37/00 B60K37/06
 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)
 B60K B60R

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.
Y	US 2007/203641 A1 (DIAZ MELVIN B [US] ET AL) 30 August 2007 (2007-08-30) paragraphs [0091] - [0093], [0096], [0101]; figure 6 -----	1-9
Y	US 2014/277937 A1 (SCHOLZ LARS [US] ET AL) 18 September 2014 (2014-09-18) the whole document -----	1-9
A	US 2018/018289 A1 (PREUSSLER STEPHAN [DE] ET AL) 18 January 2018 (2018-01-18) the whole document -----	1-9



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

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

"T" 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

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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

"&" document member of the same patent family

Date of the actual completion of the international search

3 February 2020

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2019/085341

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