

Appeal decision

Appeal No. 2016-16990

Germany

Appellant ROBERT BOSCH GMBH

Tokyo, Japan

Patent Attorney KAMEYA, Yoshiaki

The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2015-525796, entitled "Method for controlling driving of a hybrid vehicle, and a hybrid vehicle provided with control unit capable of driving in accordance with the method" [International publication on Feb. 13, 2014: WO 2014/023486, National publication of the translated version on Sep. 17, 2015: National Publication of International Patent Application No. 2015-527244] has resulted in the following appeal decision:

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The present application was originally filed on Jul. 4, 2013 (Priority Claim under the Paris Convention was received by the foreign receiving office on Aug. 10, 2012: (DE) Federal Republic of Germany) as an International Patent Application. Then, translation of the description, the scope of claims, and Abstract was submitted on Feb. 9, 2015 together with national documents, the reasons for refusal were notified on Jan. 21, 2016, and, although a written opinion and a written amendment were submitted on Apr. 26, 2016, a decision of refusal was made dated Jul. 8, 2016. Against this, an appeal

against an examiner's decision of refusal was demanded on Nov. 14, 2016.

No. 2 Regarding the Invention

[1] The Invention

The invention according to claim 1 of the present application (hereinafter, referred to as the "Invention") is as follows as viewed from the translation of the description submitted on Feb. 9, 2015 and the scope of claims amended by the written amendment submitted on Apr. 26, 2016 and the drawings at the time of the international application.

"[Claim 1]

A method for controlling driving of a hybrid vehicle (10) that can be driven by an internal-combustion engine and/or by an electrical driving unit capable of supplying electric power via a stock of stored electric energy, wherein the vehicle (10) comprises a drive control unit including a user interface, and wherein the method comprises performing setting by which, by a user utilizing the user interface, the vehicle (10) is driven only by the electrical driving unit on a priority basis after a predetermined time point (A, B, C) and/or during a predetermined period or section (a, b, c), and, when it is desired to fully charge a battery at a time of a running end, is driven by the internal-combustion engine during the section."

[2] Cited Document

(1) Described matters of Cited Document

In Japanese Patent No. 4636182 which was cited in the reason of the examiner's decision, and is a publication distributed before the priority date of the present application (hereinafter, referred to as "Cited Document"), there are the following statements relating to "control device of vehicle and control method of vehicle, program to make computer carry out the control method of vehicle, and recording medium storing the program" together with drawings.

a) "An object of this invention is to provide a control device for a hybrid vehicle, a control method capable of making a running pattern fit finely to driver's preference, a program for making a computer execute the control method, and a recording medium storing the program.

In summary, this invention is a control device of a vehicle having a plurality of running modes, and includes a destination setting unit to set a destination, a route setting unit to set a running route from an origination to a destination, a running route dividing unit to divide a running route, a running mode confirmation unit to confirm a running mode in a manner associating each section of the divided running route with any running mode based on an indication from an operator, and a running control unit to make the vehicle run in each section in an associated running mode.

It is preferred that a vehicle be a hybrid vehicle that uses an internal-combustion engine and a motor together for running, and the plurality of running modes include an HV running mode in which operation by an internal-combustion engine is allowed, and an EV running mode in which running is made using a motor while stopping an internal-combustion engine.

Preferably, a control device of a vehicle further includes an information reading unit to read information including a destination, a running route, each divided section, and a running mode associated with each divided section, from outside the vehicle. The running control unit is configured in a manner capable of running the vehicle based on the information.

Preferably, the running route dividing unit divides the running route from the origination to the destination into sections that are suited for the respective plurality of running modes, makes tentative determination of a running mode of each divided section, and the running mode confirmation unit changes a running mode associated with each section to another running mode based on an indication from an operator.

It is preferred that the running mode confirmation unit changes the position of a border point of division of a running route based on input of an operator.

According to another aspect of the invention, a control device of a vehicle having a plurality of running modes includes a setting unit to set a destination, a setting

unit to set a running route from an origination to a destination, a dividing unit to divide the running route, a confirmation unit to confirm a running mode in a manner associating one of the running modes with each section of the divided running route based on an indication from an operator, and a running control unit to make the vehicle run in a manner running in a running mode associated with each section.

It is preferred that the vehicle be a hybrid vehicle that uses an internal-combustion engine and a motor together for running, and the plurality of running modes include an HV running mode that allows operation of the internal-combustion engine, and an EV running mode for running using the motor while stopping the internal-combustion engine." (Page 4, lines 15 to 43) (The underlines were given by the body for the purpose of facilitating understanding. The same applies hereinafter.)

b) "The battery B that is a direct-current power source includes a secondary battery such as a nickel hydrogen battery or a lithium ion battery, and supplies direct-current electric power to the boosting unit 32, and, in conjunction with this, the battery B is charged by direct-current electric power from the boosting unit 32.

The boosting unit 32 boosts direct-current voltage received from the battery B, and supplies the boosted direct-current voltage to the inverter 36. The inverter 36 converts the supplied direct-current voltage into alternating-current voltage, and performs drive control of the motor generator MG1 at the time of engine start. In addition, after the start of the engine, alternating-current electric power generated by the motor generator MG1 is converted to direct-current by the inverter 36, and then converted to voltage suitable for charging of the battery B by the boosting unit 32 to charge the battery B.

In addition, the inverter 36 drives the motor generator MG2. The motor generator MG2 drives the front wheels 20R and 20L in a manner assisting the engine 2. At the time of braking, the motor generator performs regenerative operation to convert rotational energy of wheels to electric energy. The resultant electric energy is returned to the battery B through the inverter 36 and the boosting unit 32. The battery B is a battery pack, and includes a plurality of battery units B0 to Bn connected in series.

Between the boosting unit 32 and the battery B, system main relays 28 and 30 are provided, and, on the occasion of non-operation of a vehicle, high voltage is cut off."
(Page 6, lines 19 to 34)

c) "The navigation control unit 64 performs setting processing of a destination based on operation of a crew, and carries out searching processing to set a running route from an origination to the destination.

Then, as will be described later in FIG. 5, the navigation control unit 64 divides the searched running route, and carries out processing to associate one of the running modes with each section of the divided running route. Then, in order to confirm whether this association conforms to a preference of a user, processing to confirm division of a running route and a running mode associated with each section is carried out based on an indication from an operator. In this case, it is also possible for a user to change the division of sections and a running mode manually. Then, the concluded section dividing and corresponding running modes are stored. After that, when running is started, the navigation control unit 64 transmits information on running modes to the hybrid control unit 62 so as to make the vehicle run in each section in an associated running mode.

The navigation control unit 64 is provided with a memory card interface 56 as a reading unit that reads, from the outside, information including a destination, a running route, each divided section, and a running mode associated with each section. It is possible to store data generated in an unillustrated personal computer to the memory card 54 in advance, and make the navigation control unit 64 read the data via the memory card interface 56.

By this, the control device 14 that makes a vehicle run is configured in a manner capable of making the vehicle run based on the data.

The navigation control unit 64 divides a running route from an origination to a destination into sections suited for a plurality of running modes, respectively. For example, either of the EV running mode and the HV running mode is selected depending on surrounding environments of a road, an inclination, whether there is a

curve, whether there is a traffic light, and the like. Meanwhile, in a vehicle having a transmission capable of range switching, switching of a range may be performed in addition to such setting of a running mode.

Furthermore, the navigation control unit 64 also carries out processing to change a running mode associated with each section to another running mode based on an indication from an operator." (Page 7, lines 27 to 50)

d) "FIG. 4 is a flow chart showing a control structure of processing executed by the control device 14. Although this processing is executed in the navigation control unit 64 in a vehicle, it may be performed in advance of getting in the vehicle by installing beforehand software of a car navigation system on a personal computer outside the vehicle.

Referring to FIG. 4, first, when the processing starts, reception processing of setting input of a destination of vehicle running is performed, in step S1. When carrying out operation in a vehicle, an operator performs setting of a destination by operating a touch display of the display unit 48 of FIG. 2. In addition, when performing operation of a personal computer in the operator's home and the like outside the vehicle, a destination is set by operating an input device such as a mouse and a keyboard.

Next, in step S2, searching of a running route from the current location of the vehicle (or the location of the home) to a destination is performed. Then, in step S3, processing to indicate the searched running route on the screen is carried out.

In step S4, the processing becomes a state to await input for confirming the running route. The input for confirming a running route may be, for example, pushing of a "guidance start" button indicated on a touch panel. Furthermore, it may be such that, when a predetermined amount of time has elapsed without a "re-searching" button being pushed; that is, without operation, it is supposed that confirmation has been made. When there is a request for re-searching in step S4, the processing returns to step S2 from step S4. On this occasion, a step of setting a passing-through point and the like may be provided.

When it is determined in step S4 that the running route has become final and

conclusive, the processing proceeds to step S5.

In step S5, processing to divide the searched running route is performed, and, in step S6, processing to display a running mode of each divided section in a superposed manner is carried out.

Meanwhile, it may be such that only division of a running route is performed in step S5, and, in step S7 that comes after that, a user is made to select a running mode. In this case, the division of a running route may be such that it is simply divided at regular distances." (Page 8, line 27 to page 9, line 1)

e) "FIG. 7 is a diagram showing another example of change input in step S7 of FIG. 4.

FIG. 7(A) indicates that selection processing for a section is performed by touching by a finger, in the case of touch display, or by clicking, in the case of a mouse, the section A3 that has been created by division in FIG. 5 and for which a running mode is being displayed.

Then, as shown in FIG. 7(B), a pop-up display B3 that makes it possible to select a running mode of the section A3 appears. Then, an operator can change the running mode of the section A3 from HV mode to EV mode by pressing an "EV" button in the pop-up display. Meanwhile, it may be such that tentative determination of a running mode is not performed at the time point of dividing, and, a user is made to conduct selection regarding each section as indicated in FIG. 7(B).

Referring again to FIG. 4, in step S8, change of section dividing and a running mode is performed based on input of an operator that has been carried out in step S7, and the processing returns to step S7 again.

On the other hand, when there is no change input in step S7, the processing proceeds to step S9. For example, in cases such as where a button such as a "running start" button on a touch display is pressed, where operation of change input is not performed for a predetermined amount of time, and where a vehicle has started in a state that there is no operation of change input, it is determined as there is no change input of a user in step S7, and the processing progresses to step S9.

In step S9, confirmation processing of a running mode/section division is

performed, along with preservation processing to evacuate information on a running mode and section division that has become final and conclusive in an embedded hard disk, a memory, or the like.

After step S9, the processing in this flow chart finishes once at step S10." (Page 9, lines 27 to 47)

(2) Matters that can be found from the above-mentioned (1) and the drawings

f) From the above-mentioned (1) a), it can be seen that the vehicle is a hybrid vehicle using an internal-combustion engine and a motor together for running, and drive of the vehicle is controlled by selecting either of an HV running mode that allows operation of the internal-combustion engine, and an EV running mode for running using the motor while stopping the internal-combustion engine.

g) From the statements of the above-mentioned (1) d) and e) and FIG. 2 and FIG. 4, it can be seen that the hybrid vehicle includes the hybrid control unit 62 having the navigation control unit 64 through which an operator performs an indication by operating a touch display of the display unit 48.

h) From the above-mentioned (1) e), it can be seen that there is included setting so as to make, by an indication in a touch display by an operator, a hybrid vehicle be driven by the EV running mode in a section corresponding to the indication.

(3) Cited invention

From the statements of the above-mentioned (1) and (2) and the drawings, there is described the following invention in Cited Document (hereinafter, referred to as "Cited invention").

"A method of controlling driving of a hybrid vehicle capable of being driven by an HV running mode that allows operation of an internal-combustion engine, or by an EV running mode for running using a motor while stopping the internal-combustion engine,

wherein the hybrid vehicle comprises the hybrid control unit 62 having the navigation control unit 64 through which an operator performs an indication by operating a touch display of the display unit 48, and wherein the method comprises setting so as to make, by an indication in a touch display by an operator, driving be performed by the EV running mode in a section corresponding to the indication."

[3] Comparison / Judgment between the Invention and Cited invention

Since the HV running mode includes running according to a state in which at least an internal-combustion engine is operated, "by an HV running mode that allows operation of the internal-combustion engine" in Cited invention corresponds to "by the internal-combustion engine" in the Invention. Also, "by an EV running mode for running using the motor while stopping the internal-combustion engine" in Cited invention corresponds to "by an electrical driving unit capable of supplying electric power via a stock of stored electric energy" in the Invention, because it is obvious that, in a hybrid vehicle, when running using only a motor while stopping an internal-combustion engine, electric power stored in a battery in advance is supplied to the motor.

Then, "hybrid vehicle" in Cited invention corresponds to "hybrid vehicle" or "vehicle" in the Invention as viewed from its function, constitution, and technical meaning, and, in a similar fashion, "the navigation control unit 64 through which an operator performs an indication by operating a touch display of the display unit 48" corresponds to "user interface," "the hybrid control unit 62" to "drive control unit," "operator" to "user," "indication in a touch display" to "utilization of a user interface," and "section" "corresponding to the indication" to "predetermined" "section," and "in a section" to "during a section", "driving be performed by the EV running mode" and to "driven only by the electrical driving unit on a priority basis," respectively.

Accordingly, the corresponding features and the Different feature between the two are as follows.

[Corresponding features]

"A method for controlling driving of a hybrid vehicle that can be driven by an internal-combustion engine or by an electrical driving unit capable of supplying electric power via a stock of stored electric energy, wherein the vehicle comprises a drive control unit having a user interface, and wherein the method comprises performing setting by which, by a user utilizing the user interface, the vehicle is driven only by the electrical driving unit on a priority basis during a predetermined section."

[Different feature]

A point that, relating to "comprises performing setting by which, by a user utilizing the user interface, the vehicle is driven only by the electrical driving unit on a priority basis during a predetermined section," it is such that "performing setting by which, when it is desired to fully charge a battery at a time of a running end, driving is performed by the internal-combustion engine during the section" in the Invention, whereas, in Cited invention, it is unclear whether or not it has the constitution of "performing setting by which, when it is desired to fully charge a battery at a time of a running end, driving is performed by the internal-combustion engine during the section." (Hereinafter, referred to as "Different feature")

The Different feature will now be discussed below.

[Regarding the Different feature]

According to, for example, Japanese Unexamined Patent Application Publication No. 2004-236472 (refer to statements of paragraphs [0063] to [0075] and description of FIG. 5 and FIG. 6 and the like) and Japanese Unexamined Patent Application Publication No. 2007-62640 (refer to statements of paragraphs [0127] to [0137] and description of FIG. 11 to FIG. 13 and the like), it is recognized that, in the technical field of a hybrid vehicle, when the battery is desired to be charged to the extent according to an electric power quantity and the like necessary in a destination at the time of arriving at the destination, it is well-known technology (hereinafter, referred

to as "Well-known art") to make it possible, by a user interface, to set to perform a mode that gives priority to charging of the battery by operation of an internal-combustion engine in such as sections before arrival to the destination.

Then, it is also nothing but one design example (hereinafter, referred to as "Design example") to make, in a hybrid vehicle, a degree of charging of the battery according to an electric power quantity necessary in the destination be "full charge," as observed in Japanese Unexamined Patent Application Publication No. 2012-125059 (refer to statements of paragraphs [0052] to [0061], and, relating to "full charge," statements of [0061], in particular), for example.

Therefore, a person skilled in the art could have easily implemented the matters specifying the Invention according to the different feature by, in Cited invention, applying the above-mentioned Well-known art in the technical field of a hybrid vehicle, and, when the battery is desired to be charged to the extent according to an electric power quantity and the like necessary at a destination at the time of arriving at the destination, making it possible, by a user interface, to set to perform a mode that gives priority to charging of the battery by operation of an internal-combustion engine in such sections before arrival to the destination, and, on this occasion, as with the case with the above-mentioned Design example, making a degree of charging of the battery at the time of arrival at the destination be full charge.

In addition, the Invention does not provide a specific effect beyond the effect predicted on the basis of Cited invention, Well-known art, and Design example.

No. 3 Closing

Accordingly, since the Invention could have been easily made by a person skilled in the art based on the Cited invention, Well-known art, and Design example, the appellant should not be granted a patent in accordance with the provisions of Article 29(2) of the Patent Act, and, therefore, the present application should be rejected.

Therefore, the appeal decision shall be made as described in the conclusion.

Jun. 19, 2017

Chief administrative judge: ITO, Asahito
Administrative judge: MATSUSHITA, Akira
Administrative judge: MAKIHARA, Susumu