Appeal decision

Appeal No. 2015-11075

Kanagawa, Japan
Appellant NISSAN MOTOR CO. LTD.

Tokyo, Japan
Patent Attorney MORI, Tetsuya

Tokyo, Japan
Patent Attorney SUZUKI, Sobe

Tokyo, Japan
Patent Attorney TANAKA, Hidetetsu

The case of appeal against an examiner's decision of refusal of Japanese Patent Application No. 2010-237567, titled "control device of a hybrid vehicle" [the application published on May 10, 2012, Japanese Unexamined Patent Application Publication No. 2012-86802] 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 is an application dated Oct. 22 2010, for which: the reason for refusal was noticed on Mar. 6, 2014; a written opinion and a written amendment were submitted on Apr. 23, 2014; the reason for refusal was noticed on Oct. 2, 2014; then, although a written opinion and a written amendment were submitted on Nov. 7, 2014, the decision of refusal was made on May 11, 2015; and, in response to this, an appeal against an examiner's decision of refusal was requested on Jun. 10, 2015 and, at the same time, a written amendment was submitted.

No. 2 Decision to dismiss amendment for the amendment dated Jun. 10, 2015

[Conclusion of Decision to Dismiss Amendment]

The amendment dated Jun. 10, 2015 (Hereinafter, referred to as " The Amendment") shall be dismissed.

[Reason]

[1] Details of the Amendment

The Amendment is an amendment that includes amending, relating to the scope of claims, claim 1 shown in the following (1) before being amended by the Amendment to claim 1 shown in the following (2).

(1) Claim 1 of the scope of claims before Amendment

"[Claim 1]

A control device of a hybrid vehicle, comprising:

an engine capable of driving a wheel;

a motor capable of driving the wheel; and

a drive control means for driving at least one of the engine and the motor in accordance with a set vehicle speed capable of being set by switch operation by a driver,

wherein the drive control means

inhibits a stop of the engine, if, in a state that the wheel is being driven by at least the engine, the set vehicle speed is lowered by switch operation carried out by the driver, during a period until the lowered set vehicle speed is achieved."

(2) Claim 1 of the scope of claims after the Amendment

"[Claim 1]

A control device of a hybrid vehicle, comprising:

an engine capable of driving a wheel;

a motor capable of driving the wheel; and

a drive control means for performing cruise traveling by driving at least one of the engine and the motor in accordance with a set vehicle speed capable of being set by switch operation by a driver,

wherein the drive control means

inhibits a stop of the engine, if, in a state that the wheel is being driven by at least the engine and cruise traveling is being performed, the set vehicle speed is lowered by switch operation carried out by the driver, during a period until the lowered set vehicle speed is achieved." (The underlines were added by the Appellant

in order to show amended portions)

[2] Regarding purpose of Amendment and whether or not there is addition of new matters

The Amendment is an amendment that applies, in relation to claim 1, a restriction about a "drive control means" of "performing cruise traveling by driving at least one of the engine and the motor", and, further, a restriction about "driving" that "cruise traveling" is performed by that driving.

Accordingly, the Amendment as to claim 1 of the scope of claims is an amendment that restricts the matters specifying the invention described in claim 1 before the Amendment, and the field of industrial application of and the problem to be solved by the invention described in claim 1 before the Amendment and those of the invention described in claim 1 after the Amendment are identical. Therefore, the Amendment falls under an amendment for the purpose of restriction of the scope of claims prescribed in Article 17-2(5)(ii) of the Patent Act. In addition, the Amendment is not one that adds new matters.

Therefore, whether or not the appellant should be granted a patent for the invention according to claim 1 amended by the Amendment (hereinafter, referred to as "the Amended Invention") independently at the time of patent application (whether or not it complies with the provision of Article 126(7) of the Patent Act as applied mutatis mutandis pursuant to the provisions of Article 17-2(6) of the same Act) will be examined below.

[3] Judgment on independent requirements for patentability

1. Publication

(1) Described matters in Publication 1

In Japanese Unexamined Patent Application Publication No. 2010-179865 (hereinafter, referred to as "Publication 1"), which was cited in the reason of the examiner's decision and is a publication distributed in advance of the application of the present application, there is described the following matters together with drawings.

1a) "[Claim 1]

A control device of a hybrid vehicle, comprising:

a constant speed running control means comprising a driving system including

an engine, a motor, and a drive wheel, the constant speed running control means being configured to perform constant speed running control to control the driving system so as to make a vehicle speed be a target vehicle speed; and a mode transition control means for performing mode transition control between an electric-powered vehicle running mode for running by driving force of the motor and a hybrid vehicle running mode for running by driving force of the motor and the engine,

the mode transition control means being configured to stop the engine so as to execute mode transition from the hybrid vehicle running mode to the electric-powered vehicle running mode when torque calculated by adding cranking torque necessary for start-up of the engine to vehicle driving torque for running control falls below torque capable of being outputted by the motor,

wherein the mode transition control means limits stopping of the engine at a time of constant speed running control by the constant speed running control means in the hybrid vehicle running mode, even if the torque calculated by adding the cranking torque necessary for start-up of the engine to the constant-speed control driving torque that is the vehicle driving torque for constant speed running control falls below the torque capable of being outputted by the motor.

[Claim 2]

The control device of a hybrid vehicle according to claim 1,

wherein the mode transition control means stops the engine at a time of constant speed running control by the constant speed running control means in the hybrid vehicle running mode, if a state where the torque calculated by adding the cranking torque to the constant-speed control driving torque falls below the torque capable of being outputted by the motor continues for more than a prescribed time." ([Claim 1] and [Claim 2] of [the scope of claims])

1b) "[0004]

However, in a conventional control device of a hybrid vehicle, mode transition control between the hybrid vehicle mode and the electric-powered vehicle mode is performed according to vehicle driving torque, and, therefore, there is a risk that a situation where start-up and stop of an engine is performed in a short time is caused. At the time of constant speed running control by a constant speed running control means, this leads to a problem that a driver has a feeling of strangeness about start-up and stop of the engine being carried out in a short time since he/she has requested constant speed running control and, in addition, he/she himself/herself is not carrying out operation of acceleration and deceleration at all.

[0005]

The present invention has been made focusing attention on the above-mentioned problem, and an object of the present invention is to provide a control device of a hybrid vehicle that can stop an engine appropriately in accordance with vehicle driving torque while preventing start-up and stop of an engine from being carried out in a short time on the occasion of constant speed running control." (Paragraphs [0004] and [0005])

1c) "[0009]

Accordingly, in a control device of a hybrid vehicle of the present invention, even if, on the occasion of constant speed running control, torque calculated by adding cranking torque necessary for start-up of the engine to constant-speed control driving torque that is vehicle driving torque for constant speed running control falls below torque capable of being outputted by the motor, a stop of the engine is limited.

[0010]

In other words, although basically the engine is stopped when vehicle driving torque is smaller than torque calculated by subtracting the cranking torque from the torque capable of being outputted by the motor, stoppage of the engine is limited on the occasion of constant speed running control even if that condition is satisfied, and, therefore, it is possible to prevent start-up and stop of the engine from being carried out in a short time due to stopping the engine depending on vehicle driving torque on the occasion of constant speed running control.

[0011]

As a result, it is possible to stop an engine appropriately in accordance with vehicle driving torque while preventing start-up and stop of the engine from being carried out in a short time on the occasion of constant speed running control." (Paragraphs [0009] to [0011])

1d) "[0033]

In addition, the integrated controller 14 is made to be able to perform constant speed running control; that is, so-called auto cruise control (ASCD). This constant speed running control is control to keep a target vehicle speed set by intention of a driver. In the constant speed running control, as will be mentioned later, constant-speed control driving torque that is running driving torque to make an actual vehicle speed be a set target vehicle speed is calculated, a command value for each actuator (the motor/generator MG, the engine Eng, the first clutch CL1, the second clutch CL2,

the automatic transmission CVT) is calculated based on that result and transmitted to each of the controllers 15, 16, 17, 18, and 19. As described above, the integrated controller 14 performs, at normal times, control based on driver-requested driving torque that is a running driving torque calculated from a battery condition, an accelerator opening degree, and a vehicle speed (a value synchronized with the number of transmission-output rotations); that is, running control based on driver operation, and, when a request of constant speed running is received, switching to constant speed running control is made. Furthermore, when a request for constant speed running is cancelled at the time of constant speed running control, the integrated controller 14 performs switching to driver-operation-based control.
[0034]

In the present example 1, the integrated controller 14 is made to be able to detect an ON/OFF state of the auto cruise operation SW 22, and when ON state is detected, it is determined that constant speed running is requested. In addition, in the present example 1, the integrated controller 14 determines that a request of constant speed running has been cancelled in cases when detecting that the auto cruise operation SW 22 is made to be the OFF state, when the accelerator pedal is pushed, when the brake pedal is pushed, when the shift lever is switched from "D" by a shift position sensor, or so on. When it is determined that it has been cancelled in this way, the auto cruise operation SW 22 is made to be the OFF state." (Paragraphs [0033] and [0034])

1e) "[0044]

In step S9, following the determination that a request of constant speed running has been made in step S2, a target vehicle speed and a target acceleration in constant speed running control are set, and then progress to step S10 is made. In this example 1, an actual measured value of a vehicle speed at the time when a request of constant speed running has been made, which is obtained from the vehicle speed sensor 21 (refer to FIG. 1) that detects a speed of a vehicle running actually, is set as a target vehicle speed. In other words, constant speed running control will be performed so that the vehicle speed at the time when the request of constant speed running has been made may be maintained. Meanwhile, this target vehicle speed is made to be capable of being changed by the auto cruise operation SW 22 or other operation means and the like. Also, if, in a case of returning to step S1 from step S16, there is no change command that has been issued, there is no need to set a target vehicle speed once again in step S9. Furthermore, a target acceleration is an acceleration for controlling a vehicle speed so as to make an actual vehicle speed be equal to a target vehicle

speed. Moreover, in step S9, constant-speed control driving torque is calculated from the target acceleration that has been set and the weight of the vehicle on which the integrated controller 14 is mounted. In other words, in step S9, a target vehicle speed is set, and, in conjunction with this, vehicle speed feedback control to reduce deviation between the target vehicle speed and an actual vehicle speed is performed (a vehicle speed feedback control unit)." (Paragraph [0044])

1f) "[0049]

In step S14, following the determination in step S13 that constant-speed control driving torque is less than the stop determination threshold, whether or not a stop determination time is beyond a prescribed time is determined, and, in the case of Yes, a move to step S7 is made, and in the case of No, progress to step S16 is made. This prescribed time is set, based on characteristics of constant-speed control driving torque calculated by vehicle speed feedback control for the purpose of constant speed running control until the constant-speed control driving torque converges on target-vehicle-speed driving torque based on a target vehicle speed, from the viewpoint of preventing deterioration of drivability and the viewpoint of improving fuel efficiency. It is conceivable that a prescribed time is set around one second, for example. The reason of this is that, on the occasion of conducting speed reduction control of a vehicle, driving torque (speed reduction torque) becomes large only in the early stage of speed reduction in the vehicle speed feedback control." (Paragraph [0049])

1g) "[0096]

FIG. 7 is a time chart showing, in a situation where vehicle driving torque at the time of constant speed running control in 'HEV mode' (it is constant-speed control driving torque since it is a state of constant speed running control) falls under the stop determination threshold, respective properties of relation between a target vehicle speed and an actual vehicle speed, vehicle driving torque relative to the stop determination threshold and the start-up determination threshold, and a state of the engine Eng (a state of the first clutch CL1). In FIG. 7, we assume that constant speed running control has been made at the time point T0 in 'HEV mode', and a target speed has been changed at the time point T1.

[0097]

In the constant speed running control of the example 1, constant-speed control driving torque is made to be fixed torque after having made an actual vehicle speed meet the set target speed once, unless a road surface situation and the like otherwise

changes or the target vehicle speed is otherwise changed (refer to T0-T1). In this situation, there is no case that target-vehicle-speed driving torque calculated from a target vehicle speed falls below an EV-enabling driving torque (a first stage determination), or that constant-speed control driving torque falls below the stop determination threshold (a second stage determination), and, therefore, the constant speed running control in 'HEV mode' is continued.

[0098]

Here, if the target speed is changed toward the low speed side (refer to T1), a deviation between an actual vehicle speed and the target speed becomes large toward the minus side, and, thus, constant-speed control driving torque calculated by the vehicle speed feedback control for the purpose of the constant speed running control becomes very small for a slight period of time in the early stage (refer to time points T1-T4 at which a target speed has been changed). Assuming that target-vehicle-speed driving torque calculated from the target vehicle speed after this change is a value larger than the EV-enabling driving torque, the engine Eng is not stopped in the first stage determination, and the constant speed running control in 'HEV mode' is continued and transit to the second stage determination is made. In the example of this time chart, although the constant-speed control driving torque has fallen below the stop determination threshold (see T2-T3), this time period of falling (T2-T3) has not exceeded a prescribed time, and thus the engine Eng is not stopped also in the second stage determination, resulting in the constant speed running control in 'HEV mode' being continued.

[0099]

After that, constant-speed control driving torque calculated by the vehicle speed feedback control for the purpose of constant speed running control is made to be a value close to target-vehicle-speed driving torque calculated from the target vehicle speed and gradually converges on the target-vehicle-speed driving torque (refer to T4-T5). However, because, in the course of this, there is no case where constant-speed control driving torque falls below the stop determination threshold, the engine Eng is not stopped by the second stage determination, and the constant speed running control in 'HEV mode' is continued. At this time, because the target vehicle speed after change has not been changed just as it is, there is no case where target-vehicle-speed driving torque calculated from the target vehicle speed falls below the EV-enabling driving torque, the engine Eng is not stopped even in the first stage determination.

[0100]

Here, as a comparison example, assuming that a start-up determination threshold

is being set so as not to have hysteresis against a stop determination threshold (that is, the stop determination threshold in FIG. 7 is made to be the start-up determination threshold just as it is), the engine Eng is stopped by constant-speed control driving torque falling below the stop determination threshold (refer to T2), and, after that, start-up of the engine Eng is performed due to the constant-speed control driving torque exceeding the start-up determination threshold (that is, stop determination threshold) (refer to T3).

[0101]

In contrast to this, in a control device of a vehicle of the example 1, even if constant-speed control driving torque falls below a stop determination threshold, the engine Eng is not stopped, that is, mode transition from 'HEV mode' to 'EV mode' is not performed (the second stage determination), unless the continuation time exceeds a prescribed time. Therefore, it is possible to prevent a stop and start-up of the engine Eng from being conducted in a short time." (Paragraphs [0096]-[0101])

1h) "[0109]

Meanwhile, in the example 1, although a prescribed time is a fixed value that is set, based on characteristics of constant-speed control driving torque calculated by vehicle speed feedback control for the purpose of constant speed running control until the constant-speed control driving torque converges on target-vehicle-speed driving torque based on a target vehicle speed, from the viewpoint of preventing decline of driving properties and the viewpoint of improving fuel efficiency, it may be a value made to be varied within a predetermined range. For example, it is thinkable that, when it is desired to increase situations in which the engine Eng is stopped at earlier timing; that is, mode transitions from 'HEV mode' to 'EV mode' are made at earlier timing, a prescribed time that is a determination criterion for a continuation time during which constant-speed control driving torque falls below a stop determination threshold is set short, and, when it is desired to increase situations in which the engine Eng is stopped at later timing; that is, 'HEV mode' is continued at later timing, a prescribed time that is a determination criterion for continuation time during which constant-speed control driving torque falls below a stop determination threshold is set long. Here, 'within a predetermined range' means a range in which it is possible to prevent situations that a start-up and stop of the engine Eng are carried out in a short time based on: characteristics of constant-speed control driving torque calculated by vehicle speed feedback control for the purpose of constant speed running control until the constant-speed control driving torque converges on target-vehicle-speed driving

torque based on a target vehicle speed; and a stop determination threshold and a start-up determination threshold." (Paragraph [0109])

(2) Matters that can be seen from the statement of the above-mentioned (1) 1a) to 1h) and FIG. 1 to FIG. 7

1i) From the statement of the above-mentioned (1) 1a) and the statement of FIG. 1, it can be seen that a control device of a hybrid vehicle includes an engine to drive a drive wheel, and a motor to drive the drive wheel.

1j) From the statement of the above-mentioned (1) 1d), it can be seen that a control device of a hybrid vehicle includes an integrated controller configured to drive at least one of an engine and a motor in accordance with a target vehicle speed set by intention of a driver to perform constant speed running.

1k) From the statements of the above-mentioned (1) 1g) and FIG. 7, it can be seen that an engine is not stopped even if, in a state that constant speed running is being performed by driving drive wheels by the engine, a target vehicle speed is changed toward the low speed side and constant-speed control driving torque falls below a stop determination threshold set to stop the engine, unless the time period of that falling exceeds a prescribed time.

(3) Cited Invention

When the statements of the above-mentioned (1) and (2), and the drawings are put together, in Publication 1, there is described the following invention (Hereinafter, referred to as "Cited Invention").

"A control device of a hybrid vehicle, comprising:

an engine to drive a drive wheel;

a motor to drive the drive wheel; and

an integrated controller configured to drive at least one of the engine and the motor in accordance with a target vehicle speed set by intention of a driver to perform constant speed running,

wherein the integrated controller,

when, in a state of performing constant speed running by driving the drive wheel by at least the engine, the target vehicle speed is changed toward the low speed side,

the engine is not stopped even if constant-speed control driving torque falls below a stop determination threshold set to stop the engine, unless a time period of the falling exceeds a prescribed time."

(4) Described matters in Publication 2

In Japanese Unexamined Patent Application Publication No. 2004-222442 (hereinafter, referred to as "Publication 2"), which was cited in the reason of the examiner's decision, and is a Publication that had been distributed in advance of the application of the present application, there is described the following matters together with drawings.

2a) "[Claim 1]
A hybrid-vehicle running speed control device provided with an engine, a driving motor, and an electric-power-generation motor, the hybrid-vehicle running speed control device comprising: a running speed detection means to detect a running speed of its own vehicle; a running-speed-command-value setting means to set a command value of a running speed of the own vehicle; a running speed control means to set a driving torque command value so as to make the running speed detected by the running speed detection means become the running speed command value set by the running-speed-command-value setting means; a transmission-gear-ratio-command-value setting means to set a transmission gear ratio command value of a transmission from the driving torque command value set by the running speed control means and the running speed detected by the running speed detection means; an input-axis-torque-command-value setting means to set an input axis torque command value of the transmission from the driving torque command value set by the running speed control means; an engine-transient-response-characteristics detection means to detect engine torque transient response characteristics from an armature current value of the electric-power-generation motor at a time of series running; an engine torque calculation means to calculate engine torque based on the engine torque transient response characteristics detected by the engine-transient-response-characteristics detection means at a time of parallel running; and a torque allocation means to allocate, on an occasion of at least parallel running, the input axis torque command value set by the input-axis-torque-command-value setting means to an engine torque command value and a driving motor torque command value according to a running mode based on the engine torque calculated by the engine torque calculation means."
([Claim 1] of [The scope of claims])

2b) "[0009]
The continuously variable transmission 5 is controlled by a transmission controller 12, the clutch 3 is controlled by a clutch controller 13, the engine 2 is controlled by an engine controller 14, the driving motor 1 and the electric-power-generation motor 4 are controlled by a motor controller 15 via an inverter 7, the battery 8 is configured to be controlled by a battery controller 16, and an integrated controller 10 and a running speed controller 11 are located above those controllers.
[0010]
The integrated controller 10 is a controller responsible for performing control at the time of usual accelerator pedal pressing in accordance with a charging condition of the battery monitored by the battery controller 16, a running speed of its own vehicle detected by a running speed sensor 6, and a pressing amount or a pressing speed of an accelerator pedal detected by an accelerator sensor 9; that is, acceleration intention of a driver. Specifically, the integrated controller 10 calculates torque command values for the motor 1 and the engine 2 and a transmission gear ratio command value for the continuously variable transmission 5, and outputs them to the respective controllers that control the motor or the like. The running speed controller 11, on the other hand, is a controller responsible for performing automatic running speed control of its own vehicle when the accelerator pedal is not being pressed, the automatic running speed control being performed in accordance with arithmetic processing of FIG. 2, based on: a state of the main switch (SW in this figure: an automatic running speed control request switch according to manual operation by a driver) 17; a state of a set switch (a target running speed setting switch of automatic running speed control according to driver's manual operation) 18; a state of an accelerator switch (an acceleration request switch according to driver's manual operation) 19; a state of a coast switch (a speed reduction request switch according to driver's manual operation) 20; a state of a cancel switch (an automatic running speed control suspension switch according to driver's manual operation) 21; a state of a brake switch 22 that monitors pressing of a brake pedal; operating conditions of the engine 2 monitored by the engine controller 14; operating conditions of the motor 1 monitored by the motor controller 15; and an engaging/disengaging state of the clutch 3 monitored by the clutch controller 13." (Paragraphs [0009] and [0010])

2c) "[0025]
According to this arithmetic processing, if, in a state that the main switch 17 is ON,

the brake switch 22 is OFF, and the cancel switch 21 is OFF, the set switch 18 is turned on, a running speed Vsp at that time is set as a running speed command value cVsp, and, together with this, a running speed control execution flag Fvsp is set, both operations being performed as a constant speed control mode. Once the running speed control execution flag Fvsp is set in this way, the running speed Vsp at the time when the set switch 18 has been turned on is kept being set as the running speed command value cVsp, unless the accelerator switch 19 or the coast switch 20 is turned on. Also, in a period during which the running speed control execution flag Fvsp is ON, even if the accelerator switch 19 or the coast switch 20 is turned on, the running speed Vsp at the time when the set switch 18 has been turned on is kept being set to the running speed command value cVsp after the accelerator switch 19 or the coast switch 20 has returned to OFF state. On the other hand, when the accelerator switch 19 is turned on, the running speed command value cVsp is set larger by a running speed change amount Δ Vsp0, as the acceleration control mode. In contrast, when the coast switch 20 is turned on, the running speed command value cVsp is set smaller by the running speed change amount Δ Vsp0, as the speed reduction control mode. Furthermore, during such running speed control, if the main switch 17 is turned off, or if the brake switch 22 is turned on, or if the cancel switch 21 is turned on, the running speed control execution flag Fvsp is reset, and, together with this, the running speed command value cVsp is set to '0'." (Paragraph [0025])

(5) Matters that can be seen from the above-mentioned (4) 2a) to 2c)

2d) From the statement of the above-mentioned (4) 2b) and (4) 2c), it can be seen that a hybrid-vehicle running speed control device is provided with a coast switch that is a speed reduction request switch to set a running speed command value smaller by driver's manual operation, and a set switch to set a running speed at the time to a running speed command value by driver's manual operation.

(6) Technology stated in Publication 2

When the statements of the above-mentioned (4) and (5) and the drawings are put together, in Publication 2, there is described the following technology (hereinafter, referred to as "Technology stated in Publication 2").

"A hybrid-vehicle running speed control device, comprising: a coast switch that is a speed reduction request switch to set a running speed command value smaller by

driver's manual operation; and a set switch to set a running speed at the time to a running speed command value by driver's manual operation."

2. Comparison / Judgment of Amended Invention and Cited Invention

"Drive wheel" in the Cited Invention corresponds to "wheel" in the Amended Invention seen from its function, constitution, and technical meaning. In a similar fashion, "driving" corresponds to "capable of driving", "set" to "capable of being set", "target vehicle speed" to "set vehicle speed", "constant speed running" to "cruise traveling", "integrated controller" to "drive control means", "the target speed is changed toward the low speed side" to "set vehicle speed is lowered", and "engine is not stopped" to "inhibits a stop of the engine".

Then, "a target vehicle speed set by intention of a driver" in the Cited Invention and "a set vehicle speed capable of being set by switch operation by a driver" in the Amended Invention are identical to the extent that they are "a set vehicle speed capable of being set by a driver", and

"when the target vehicle speed is changed toward the low speed side, the engine is not stopped even if constant-speed control driving torque falls below a stop determination threshold set to stop the engine, unless a time period of the falling exceeds a prescribed time" in the Cited Invention and "inhibiting a stop of the engine, if the set vehicle speed is lowered, during a period until the lowered set vehicle speed is achieved" in the Amended Invention are identical to the extent that "when a set vehicle speed is lowered, a stop of an engine is inhibited under a fixed condition".

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

[Corresponding feature]

"A control device of a hybrid vehicle, comprising:

an engine capable of driving a wheel;

a motor capable of driving the wheel; and

a drive control means for performing cruise traveling by driving at least one of the engine and the motor in accordance with a set vehicle speed capable of being set by a driver,

wherein the drive control means

inhibits a stop of the engine under a fixed condition if, in a state that the wheel is being driven by at least the engine and cruise traveling is being performed, the set

vehicle speed is lowered."

[Different feature 1]

A point that, relating to a set vehicle speed capable of being set by a driver, it is "a set vehicle speed capable of being set by switch operation by a driver" in the Amended Invention, whereas, in the Cited Invention, it is "a target vehicle speed set by intention of a driver" and thus a specific means by which a driver sets the set vehicle speed is unclear.

[Different feature 2]

A point that, in the Amended Invention, "the set vehicle speed is lowered by switch operation carried out by the driver", whereas, in the Cited Invention, it is unclear by what means a target speed is changed toward the low speed side.

[Different feature 3]

A point that, relating to inhibiting a stop of an engine under a fixed condition if a set vehicle speed is lowered, "if a set vehicle speed is lowered, a stop of the engine is inhibited during a period until the lowered set vehicle speed is achieved" in the Amended Invention, whereas, in the Cited Invention, "when the target vehicle speed is changed toward the low speed side, the engine is not stopped even if constant-speed control driving torque falls below a stop determination threshold set to stop the engine, unless a time period of the falling exceeds a prescribed time".

Hereinafter, the aforementioned different features will be discussed.

[About Different Feature 1]

The Technology stated in Publication 2 is a technology that includes "a hybrid-vehicle running speed control device, comprising: a set switch to set a running speed at the time to a running speed command value by driver's manual operation", and it is a commonly used means in the technical field in question to set a running speed command value by manual operation of a set switch by a driver. Therefore, it is a matter that could have been achieved easily by a person skilled in the art to adopt, as a specific means for setting a target vehicle speed by intention of a driver in the Cited Invention, a set switch in the Technology stated in Publication 2, and make setting of a target vehicle speed according to intention of a driver be setting according to driver's switch operation, leading to the matters specifying the invention of the

Amended Invention relating to the above-mentioned Different Feature 1.

[About Different Feature 2]

The Technology stated in Publication 2 is a technology that includes "a coast switch that is a speed reduction request switch to set a running speed command value smaller by driver's manual operation", and, according to this technology, it is possible to set a running speed command value smaller by manual operation of a coast switch by a driver.

Furthermore, in the statement of "this target vehicle speed is made to be capable of being changed by the auto cruise operation SW 22 or other operation means and the like" (refer to the above-mentioned "1.(1) 1e)") in Publication 1 (hereinafter, referred to as "Matters described in Publication 1"), there is described the auto cruise operation SW 22 or other operation means and the like for changing a target vehicle speed, and, seen from the common general technical knowledge, it is natural to understand that operation according to the auto cruise operation SW22 or an operation means is performed by a driver.

Then, it could be easily achieved by a person skilled in the art to, in the Cited Invention, apply the above-mentioned Technology stated in Publication 2 that is a technology to perform constant speed running control of a hybrid vehicle, or the Matters described in Publication 1 mentioned above to make a means for changing a target speed toward the low speed side be a means according to switch operation by a driver, leading to the matters specifying the invention of the Amended Invention relating to the above-mentioned Different Feature 2.

[About Different Feature 3]

The content of control according to a control device of a hybrid vehicle of the Cited Invention is that "when, in a state of performing constant speed running by driving the drive wheel by at least the engine, the target vehicle speed is changed toward the low speed side, the engine is not stopped even if constant-speed control driving torque falls below a stop determination threshold set to stop the engine, unless a time period of the falling exceeds a prescribed time". Then, according to the statement in Publication 1 that "[0098] ... if the target speed is changed toward the low speed side (refer to T1), a deviation between an actual vehicle speed and the target speed becomes large toward the minus side, and, thus, constant-speed control driving torque calculated by the vehicle speed feedback control for the purpose of the constant speed running control becomes very small for a slight period of time in the

early stage (refer to time points T1-T4 at which a target speed has been changed). ... In the example of this time chart, although the constant-speed control driving torque has fallen below the stop determination threshold (see T2-T3), this time period of falling (T2-T3) has not exceeded a prescribed time, and thus the engine Eng is not stopped also in the second stage determination, resulting in the constant speed running control in 'HEV mode' being continued." (refer to the above-mentioned "1. (1) 1g)"), even if a target speed is changed toward the low speed side, and constant-speed control driving torque falls below a stop determination threshold for a slight period of time in the early stage after the target speed has been changed toward the low speed side, an engine will not be stopped, unless this time period of falling exceeds a prescribed time.

Then, according to the statement in Publication 1 that "[0109] .. a prescribed time is a fixed value that is set, based on characteristics of constant-speed control driving torque calculated by vehicle speed feedback control for the purpose of constant speed running control until the constant-speed control driving torque converges on target-vehicle-speed driving torque based on a target vehicle speed, from the viewpoint of preventing decline of driving properties and the viewpoint of improving fuel efficiency" (refer to the above-mentioned "1. (1) 1h)"), "a prescribed time" is determined by taking into consideration characteristics until constant-speed control driving torque converges on a target vehicle speed.

Moreover, according to the statement of the above-mentioned "1. (1) 1c)" in Publication 1, a problem to be solved by the Cited Invention is to prevent a start-up and stop of an engine from being carried out in a short time on the occasion of constant speed running control to limit a stop of the engine.

Then, it could be easily achieved by a person skilled in the art to, in the Cited Invention, when a target vehicle speed is changed toward the low speed side, determine a prescribed time in the light of characteristics until convergence on a target vehicle speed is made, limit a stop of an engine for a time period during which constant-speed control driving torque falls below a stop determination threshold set so as to stop the engine, or, as a period exceeding that, at least until convergence on the target vehicle speed is made, and, by this, prevent a start-up and stop of the engine from being carried out in a short time, leading to the matters specifying the invention of the Amended Invention relating to the above-mentioned Different Feature 3.

Then, when seen as a whole, the Amended Invention does not provide specific effect beyond effect predicted on the basis of the Cited Invention, the Technology

stated in Publication 2, and the Matters described in Publication 1.

3. Summary

Therefore, the Amended Invention is an invention that could have been easily invented by a person skilled in the art based on the Cited Invention, the Technology stated in Publication 2 and the Matters described in Publication 1, and, therefore, the appellant should not be granted a patent for it independently at the time of patent application under the provisions of Article 29(2) of the Patent Act.

4. Closing

As mentioned above, because the Amendment violates the provisions of Article 126(7) as applied mutatis mutandis pursuant to the provisions of Article 17-2(6) of the Patent Act, it should be dismissed under the provisions of Article 53(1) of the same Act which is applied mutatis mutandis by Article 159(1) of the same Act.

Accordingly, the case has resulted in the decision as stated in [Conclusion of Decision to Dismiss Amendment].

No. 3 Regarding the Invention

1. The Invention

Since the Amendment has been dismissed as described above, the invention according to claim 1 of the present application (Hereinafter, referred to as "the Invention") is an invention as has been described in the above-mentioned "No. 2 [Reason] [1] (1)", seen from the statements of the description and the scope of claims amended by the written amendment submitted on Nov. 7, 2014, and the drawings affixed to the application at the time of the application.

2. Statements and the like in Publication

Publication cited in the reason of the examiner's decision, the described matters of the Publication, the Cited Invention, and the technology stated in Publication 2 are as described in the above-mentioned "No. 2 [Reason] [3] 1.".

3. Comparison / judgment

The Invention corresponds to an invention made by deleting to the effect that "cruise traveling" is performed from "performing cruise traveling by driving at least one of the engine and the motor" that is a limitation matter about a "drive control

means" in the Amended Invention examined in the above-mentioned "No. 2 [Reason] [2]", and, further, deleting to the effect that "cruise traveling" is performed that is a limitation matter for "driving" in the Amended Invention.

Accordingly, as has been described in the above-mentioned "No. 2 [Reason] [3] 2.", the Amended Invention that includes whole matters specifying the invention of the Invention is an invention that could be easily invented by a person skilled in the art based on the Cited Invention, the Technology stated in Publication 2 and the Matters described in Publication 1, and, therefore, the Invention could also have been easily invented by a person skilled in the art based on the Cited Invention, the Technology stated in Publication 2 and the Matters described in Publication 1.

4. Summary

As mentioned above, the Invention could have been easily invented by a person skilled in the art based on the Cited Invention, the Technology stated in Publication 2 and the Matters described in Publication 1, and, for this reason, the appellant should not be granted a patent for it in accordance with the provisions of Article 29(2) of the Patent Act.

No. 4 Closing

As No. 3 above, the appellant should not be granted a patent for the Invention in accordance with the provisions of Article 29(2) of the Patent Act, and, thus, the present application should be rejected.

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

Jan. 18, 2016

Chief administrative judge:	NAKAMURA, Tatsuyuki
Administrative judge:	MATSUSHITA, Akira
Administrative judge:	KAJIMOTO, Naoki