Appeal decision

Appeal No. 2015-14575

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The case of appeal against the examiner's decision of refusal of Japanese Patent Application No. 2012-522937, entitled "THERMAL MANAGEMENT SYSTEM, VEHICLE, AND ASSOCIATED METHOD" (International Publication No. WO2011/017052 published on February 10, 2011, National Publication of International Patent Application No. 2013-500433 published on January 7, 2013), has resulted in the following appeal decision:

Conclusion

The appeal of the case was groundless.

Reason

No. 1 History of the procedures

The application was originally filed on July 26, 2010 as an International Patent Application (priority claim under the Paris Convention received by foreign receiving office: July 27, 2009, United States). The national form paper was filed on January 26, 2012, and the translation of the description, claims, abstract, and drawings was filed on March 23, 2012 with written submission of translation of International application. A notice of reasons for refusal was issued on July 30, 2014, and the written opinion and the written amendment were submitted on October 30, 2014. However, the examiner's decision of refusal was issued on March 31, 2015. Against this, an appeal against the examiner's decision of refusal was made on August 4, 2015, and at the same time, the written amendment was submitted. The reasons for refusal were noticed by the body on April 1, 2016, and the written opinion and the written amendment were submitted on June 30, 2016.

No.2 The Invention

The invention according to claims 1 to 15 of the present application is specified by matters described in claims 1 to 15, in accordance with the translation of the

description according to written submission of translation of International application, claims amended by the written amendment submitted on June 30, 2016, and the translation of the drawings of written submission of translation of International application. The invention according to claim 1 (referred to as "the Invention") is as follows.

"[Claim 1]
A thermal management system comprising:
an engine coupled to an alternator;
a first radiator operably coupled with the engine;
a first radiator fan motor in electrical connection with the alternator; and
at least one second radiator fan motors in electrical connection with the alternator, wherein
the first radiator fan motor is mechanically decoupled from the engine, and the first radiator fan motor drives a first fan to create an air flow across the radiator,
each of the at least one second radiator fan motors is mechanically decoupled from the engine, and each of the at least one second radiator fan motors drives the respective second fan to create a second air flow across the first radiator, and the first fan and the respective second fans are oriented relative to the first radiator to provide an airflow pattern that differs from an airflow pattern that would be created if there was only a single radiator fan associated with the first radiator,
the thermal management system further comprising a controller that can operate the first radiator fan motor when the engine is not operating, wherein
when the engine is not operating, the alternator does not provide electrical power to the first radiator fan motor (the underlines are added by Appellant to indicate the amended parts).

No. 3 Publication
1. Publication 1
(1) Described matters in Publication 1
Japanese Unexamined Patent Application Publication No. 2001-317353 (referred to as "Publication 1" below), which is a publication distributed before the priority date for the present application, was cited in the reasons for refusal by the body. Publication 1 includes the following description with drawings.

1a) "[0010]
DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT
Reference will hereinafter be made to the drawings in order to facilitate a better understanding of the present invention. FIG. 1 shows a schematic circuit block diagram of a vehicular cooling system to which a preferred embodiment according to the present invention is applicable. An engine speed sensor 13 to detect engine speed and a coolant temperature sensor 14 to detect coolant temperature of an engine are connected to an engine controller 12 to control an engine 11.
[0011] Coolant of the engine 11 is cooled with a radiator 15 which is arranged within an engine room . A condenser 16 of the air-conditioner A/C is disposed in a vehicular forward/rearward (longitudinal) direction together with the radiator 15. A motor fan 17 (17a, 17b) is disposed after them on a rear side of the vehicle. The condenser 16

and radiator 15 are cooled in accordance with an outside air generated by the travelling vehicle and the motor fan 17 (17a, 17b)." (paragraphs [0010] and [0011])

1b) "[0012] This motor fan 17 is controlled by a control unit 18. The control unit 18 includes: a motor fan controller 19 having a control program; and a PWM driver 20 (20a, 20b) connected to the respective motor fans 17a, 17b. The motor fan controller 19 is connected to the engine controller 12 to detect the engine speed and coolant temperature ,and also is connected to a pressure sensor 21 to read a refrigerant pressure of an air conditioner and an outer temperature sensor 22 to detect an outer air temperature outside the vehicle.
[0013] The motor fan controller 19 calculates a duty ratio to control a drive of the motor fan 17 and outputs the calculated duty ratio to the corresponding PWM driver 20. To calculate the duty ratio of the motor fan, use is made of previously prepared maps including a map representing a relationship between the duty ratio of the motor fan, and a pressure of the refrigerant and the coolant temperature shown in FIG. 2, a map representing a relationship between the duty ratio of the motor fan and a power generating current of the power generator shown in FIG. 3, a map representing a relationship between the power generating current of the power generator and the torque thereof shown in FIG. 4, and a map representing a relationship between the duty ratio of the motor fan and a torque of a compressor shown in FIG. 5.
[0014] The PWM driver 20 drives the corresponding motor fan 17 with a battery voltage as a power supply upon receipt of an output of the motor fan controller 19. The battery 23 is charged via a regulator 25 with an AC power generator 24 driven by an engine." (paragraphs [0012] to [0014])

(2) Matters found from the description and drawings of Publication 1
The following can be found from the above (1) and FIG. 1.

1c) Based on the description in 1a) in (1) and FIG. 1, it can be found that the radiator 15 cools the coolant of the engine 11 and is cooled with the motor fans 17a and 17b.

1d) Based on the description in 1b) in (1) and FIG. 1, it can be found that the engine 11 drives the AC power generator 24 and that the battery 23 is charged with the AC power generator 24.

1e) Based on the description in 1b) in (1) and FIG. 1, it can be found that the motor fans 17a and 17b are driven by being connected to the battery 23, which is charged with the AC power generator 24, as a power supply via the PWM driver 20.

(3) Cited Invention
Based on the descriptions in (1), (2) and FIG. 1, the following invention (referred to as "Cited Invention") is described in Publication 1.

"A controller of vehicular motor fans 17a and 17b, comprising:
an engine 11 configured to drive an AC power generator 24;
a radiator 15 configured to cool coolant of the engine 11;
a motor fan 17a configured to have a battery 23 charged with the AC power

generator 24 as a power supply; and

a motor fan 17b configured to have the battery 23 charged with the AC power generator 24 as a power supply, wherein

the controller of vehicular motor fans cools the radiator 15 by driving the motor fans 17a and 17b."

2. Publication 2

(1) Described matters in Publication 2

German Unexamined Patent Application Publication No. 10043579 (referred to as "Publication 2" below), which is the publication distributed before the priority date for the present application, was cited in the reasons for refusal by the body. Publication 2 includes the following description with the drawings.

"[0013] Die Komponenten des Kuehlsystems und des elektrischen Systems sind in Fig. 1 dargestellt. Ein Dieselmotor 2 treibt einen Hilfsabtrieb 1 an, der wiederum ueber einen Keilriemen einen Generator 3 antreibt. ...Der Drehstrom wird fuer einen Verbraucher 4 (Bordnetz) mittels eines Gleichrichters 5 fuer die Uebergabe umgeformt. ...Weiterhin wird Drehstrom variable Frequenz ueber elektrische Leitungen 6 von den elektrischen Lueftermotoren 5a, 5b und 5c der Luefter 9a, 9b, 9c bezogen. Die Luefter 9a und 9b foerdern Kuehlluft durch die Motorwasserkuehler 7a und 7d. Der Luefter 9c ist einem Ladeluftkuehler 7c zugeordnet. Die elektrischen Leitungen 6 zu den Lueftermotoren koennen durch Schalter 11a, 11b und 11c und ihnen zugeordneten Betaetigungsgliedern unterbrochen werden...."
(paragraph [0013], a-umlaut, o-umlaut, and u-umlaut are respectively expressed as ae, oe, and ue)

(translation by the body: [0013] A structure of a cooling system and an electric system is illustrated in Fig. 1. A diesel engine 2 drives a driving shaft 1 and further drives a generator 3 via a V-belt. The generator 3 supplies a three-phase AC voltage at a frequency in proportion to an engine speed at the time.... The three-phase AC voltage is converted by a rectifier 5 and is supplied to a power consumption side 4 (vehicle electric system).... In addition, it is indicated that the three-phase AC voltage, whose frequency is changed, is supplied to electric wiring 6 of electric fan motors 5a, 5b, and 5c of fans 9a, 9b, and 9c. The fans 9a and 9b respectively send cooling air to engine cooling water coolers 7a and 7b. The fan 9c is associated with a supercharged air cooler 7c. The electric wiring 6 to the fan motor can be cut off by switches 11a, 11b, and 11c and an associated actuator....)

(2) Technique in Publication 2

Putting the description in (1) and Fig. 1 together, the following technique (referred to as "technique in Publication 2" below) is disclosed in Publication 2.

"technique for supplying power from the generator 3 driven by the diesel engine 2 to the electric fan motors 5a, 5b, and 5c for respectively driving the fans 9a, 9b, and 9c provided in the engine cooling water coolers 7a and 7b and the supercharged air cooler 7c of the diesel engine 2".

No. 4 Comparison / Judgment

The Invention is compared with the Cited Invention.

"The controller of the vehicular motor fans 17a and 17b" in the Cited Invention is applied to "the vehicular cooling system". Therefore, from the viewpoint of the function, the structure, or the technical significance, "the controller of the vehicular motor fans 17a and 17b" corresponds to "the thermal management system" in the Invention. Similarly, "the AC power generator 24" corresponds to "the alternator", and "the engine 11" corresponds to "the engine". "The engine 11 for driving the AC power generator 24" corresponds to "the engine coupled with the alternator", and "the radiator 15" corresponds to "the first radiator". "The radiator 15 for cooling the coolant of the engine 11" corresponds to "the first radiator operably coupled with the engine". "The motor fan 17a" corresponds to "the first radiator fan motor", and "the motor fan 17b" corresponds to "the at least one second radiator fan motors". "To cool the radiator 15 by driving the motor fan 17a" corresponds to "To drive the first fan by the first radiator fan motor to create an air flow across the radiator", and "To cool the radiator 15 by driving the motor fan 17b" corresponds to "To drive the second fan by each of the at least one second radiator fan motors to create a second air flow across the first radiator".

"The motor fan 17a" and "the motor fan 17b" in the Cited Invention respectively "have the battery 23 charged with the AC power generator 24 as a power supply" and are not directly driven by "the engine 11". Therefore, the motor fans 17a and 17b respectively correspond to "the first radiator fan motor mechanically decoupled from the engine" and "the at least one second radiator fan motors mechanically decoupled from the engine" in the Invention.

In addition, in the Cited Invention, "the motor fan 17a" and "the motor fan 17b", which are multiple fans are provided in "the radiator 15". Therefore, it is obvious that "the motor fan 17a" and "the motor fan 17b" in the Cited Invention are oriented to a direction to provide an airflow pattern that differs from an airflow pattern that would be created in a case where a single motor fan is provided in "the radiator 15".

Therefore, Corresponding features and the different features of the Invention and the Cited Invention are as follows.

[Corresponding features]

"A thermal management system comprising:

an engine configured to be coupled with an alternator;

a first radiator configured to be operably coupled with the engine;

a first radiator fan motor; and

at least one second radiator fan motors, wherein

the first radiator fan motor is mechanically decoupled from the engine, and the first radiator fan motor drives a first fan to create an air flow across the radiator,

each of the at least one second radiator fan motors is mechanically decoupled from the engine, and each of the at least one second radiator fan motors drives a second fan to create a second air flow across the first radiator, and each of the first fan and the respective second fans is oriented relative to the first radiator to provide an airflow pattern that differs from an airflow pattern that would be created if there was only a single radiator fan associated with the first radiator."

[The different feature 1]

In the Invention, "the first radiator fan motor" and "the at least one second radiator fan motors" are "in electrical connection with the alternator", and "the alternator does not supply power to the first radiator fan motor when the engine is not operated". Whereas, in the Cited Invention, "the motor fan 17a" and "the motor fan 17b" "have the battery 23 charged with the AC power generator 24 as a power supply" (referred to as "different feature 1" below).

[The different feature 2]

In the Invention, "the thermal management system further comprises a controller that can operate the first radiator fan motor when the engine is not operating". Whereas, in the Cited Invention, it is not obvious how to control the motor fan 17a when the engine 11 is not operating (referred to as "different feature 2" below).

The above different features will be now discussed below.

[Regarding the different feature 1]

The technique in Publication 2 is "the technique for supplying power from the generator 3 driven by the diesel engine 2 to the electric fan motors 5a, 5b, and 5c for respectively driving the fans 9a, 9b, and 9c provided in the engine cooling water coolers 7a and 7b and the supercharged air cooler 7c of the diesel engine 2". Therefore, it is obvious in view of the common general technical knowledge that the generator 3 does not supply power to the electric fan motors 5a, 5b, and 5c, since the generator 3 is not driven when the diesel engine 2 is not operated.

Accordingly, in the Cited Invention, the technique in Publication 2 in the technical field of the electric radiator fan is applied, and the AC power generator 24 driven by the engine 11 is employed as the power supply of "the motor fan 17a" and "the motor fan 17b" in addition to the battery 23 charged by the AC power generator 24, and "the motor fan 17a" and "the motor fan 17b" are electrically connected to the AC power generator 24. Also, when the engine 11 is not operating, the AC power generator 24 does not supply power to at least the motor fan 17a. According to the above points, a person skilled in the art could have easily implemented the matters specifying the Invention according to the different feature 1.

[Regarding the different feature 2]

An excessive temperature increase in an engine room is prevented by operating the radiator fan after the engine is stopped, and degradation of components caused by heat and generation of air bubbles in a fuel supply system, or so-called vapor lock phenomenon, are prevented. This is conventional means in the technical field (referred to as "conventional means" below; for example, refer to Japanese Unexamined Patent Application Publication Nos. 2008-8264, 2006-97648, and 2004-353457). Therefore, in the Cited Invention, the conventional means is employed to prevent a failure caused by an excessive temperature increase in the engine room , and the controller is provided which can operate at least the motor fan 17a when the engine is not operating. According to this, a person skilled in the art could have easily implemented the matters specifying the Invention according to the different feature 2.

The Invention as a whole does not provide a specific effect beyond an effect predicted on the basis of the Cited Invention, the technique in Publication 2, and the conventional means.

No. 5 Closing

The Invention could be easily made by a person skilled in the art based on the Cited Invention, the technique in Publication 2, and the conventional means. Therefore, since Appellant should not be granted a patent for the invention in accordance with the provisions of Article 29(2) of the Patent Act, the present application should be rejected.

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

August 12, 2016

Chief administrative judge: KATO, Tomoya
Administrative judge: MATSUSHITA, Akira
Administrative judge: KAJIMOTO, Naoki