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**Datasheet for the decision
of 11 March 2020**

Case Number: T 2020/16 - 3.2.04

Application Number: 08012618.8

Publication Number: 2014904

IPC: F02M25/08, B60K15/035,
F02D41/00, B60W20/00, B60K6/20

Language of the proceedings: EN

Title of invention:

Evaporative emission control in battery powered vehicle with
gasoline engine powered generator

Patent Proprietor:

GM Global Technology Operations LLC

Opponent:

Bayerische Motoren Werke Aktiengesellschaft

Headword:

Relevant legal provisions:

EPC Art. 56
RPBA Art. 12(4)

Keyword:

Inventive step - (no) - combination invention (no)
Late-filed request - submitted with the statement of grounds
of appeal - admitted (no)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 2020/16 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 11 March 2020

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Decision under appeal: **Interlocutory decision of the Opposition**
Division of the European Patent Office posted on
30 June 2016 concerning maintenance of the
European Patent No. 2014904 in amended form.

Composition of the Board:

Chairman W. Van der Eijk
Members: C. Kujat
J. Wright

Summary of Facts and Submissions

I. The appeal lies from the interlocutory decision of the opposition division of the European Patent Office, posted on 30 June 2016 concerning maintenance of the European Patent No. 2 014 904 in amended form pursuant to Articles 101(3) (a) and 106(2) EPC.

II. Opposition was filed under Article 100(a) EPC based on lack of novelty and on lack of inventive step. The opposition division held that the patent as amended according to a 1st auxiliary request and the invention to which it related met the requirements of the EPC, having regard inter alia to the following pieces of evidence:

E2: US 5 962 927 A1

E5: US 5 437 257 A1

The following prior art was filed with the opponent's statement of appeal:

E7: US 6 321 727 B1

III. The appellant opponent lodged an appeal, received on 30 August 2016, against this decision and simultaneously paid the appeal fee. The statement setting out the grounds of appeal was received on 28 October 2016.

IV. The proprietor also lodged an appeal, received on 9 September 2016, against this decision and simultaneously paid the appeal fee. The statement setting out the grounds of appeal was received on 8 November 2016. With letter of 14 October 2019, the proprietor withdrew its appeal.

- V. In preparation for oral proceedings the board issued a communication pursuant to Article 15(1) RPBA dated 26 September 2019 setting out its provisional opinion on the relevant issues. After withdrawal of the proprietor's appeal, the oral proceedings scheduled for 11 May 2020 were cancelled.
- VI. The appellant opponent requests that the decision under appeal be set aside and that the European patent No. 2 014 904 be revoked.
- VII. After withdrawal of its appeal, the proprietor, as party as of right and respondent to the appeal of the opponent, did not make any submissions or file any requests. With its reply to the opponent's statement of grounds of appeal, the proprietor requested that the patent be maintained as granted (Main Request), or, auxiliarily, in amended form based on the auxiliary request filed during oral proceedings before the opposition division (1st Auxiliary Request), or as upheld by the opposition division (2nd Auxiliary Request) or in amended form on the basis of one of the 2nd to 4th auxiliary requests filed on 12 May 2016 (now 3rd to 5th Auxiliary Requests).
- VIII. Independent claim 1 according to the relevant requests reads as follows:

Main Request

"A method of operating a fuel evaporative emission control system (10) in a plug-in hybrid vehicle driven by a battery powered electric motor A with a supplemental gasoline engine (12) powered-electric generator operated on-demand for supplemental electric power for the vehicle, where the vehicle comprises a

gasoline fuel tank (18), a fuel vapor vent passage (20) from the fuel tank (18) to a fuel vapor adsorption canister (50), a first air and fuel vapor flow passage (70) from the canister (50) for venting the canister (50) and for introduction of purge air to the canister (50) to purge fuel vapor from the canister (50), and a second air and fuel vapor flow passage (82) from the canister (50) for passage of purge air and purged fuel vapor from the canister (50) to an air induction system of the engine (12); the method comprising: opening the first (70) and second (82) air and fuel vapor passages during engine operation; opening the first air and fuel vapor passage (70), but not the second air and fuel flow passage (82), when the vehicle is not operating and the gasoline is being added to the fuel tank (18); and closing both of the first (70) and second (82) air and fuel vapor passages for preventing diurnal vapor generation and preventing bleeding of fuel vapor from the canister (50) when the vehicle is not in operation and when the vehicle is in operation but the gasoline engine (12) is not being operated."

1st Auxiliary Request

As for the Main Request but with the following amendments (additions and deletions highlighted by the board):

"... a fuel vapor vent passage (20) from the fuel tank (18) to a fuel vapor adsorption canister (50) without being installed a closing valve in the fuel vapor vent passage (20) for preventing diurnal vapor generation, a first air and fuel vapor flow passage (70) from the canister (50) for venting the canister (50) and for ... and otherwise, closing both of the first (70) and second (82) air and fuel vapor passages for preventing

diurnal vapor generation and preventing bleeding of fuel vapor from the canister (50) ~~when the vehicle is not in operation and when the vehicle is in operation but the gasoline engine (12) is not being operated.~~".

2nd Auxiliary Request (patent as maintained by the opposition division)

As for the Main Request but with the following features added at the end of the claim:

"wherein the vehicle comprises a computer control module (14) for operation of the evaporative emission control system (10),
the control module (14) acquires temperature and pressure data of the fuel in the fuel tank (18) at predetermined times during vehicle operation;
the control module (14) compares fuel temperatures and fuel tank pressures taken at a first time and at a second later time to determine whether there is a fuel vapor leak from the fuel tank (18) or canister (50)."

- IX. The appellant opponent argued as follows:
The subject matter of independent claim 1 of the 2nd Auxiliary Request is rendered obvious by a combination of E2, E5 and E7.
- X. In its grounds of appeal, the proprietor argued as follows with regard to the Main Request: The subject matter of independent claim 1 of the patent is not rendered obvious by a combination of E2 and E5, since none of these documents discloses features C1, C2 or C3. In its reply to the opponent's grounds of appeal, the proprietor argued as follows with regard to the 2nd Auxiliary Request: Document E7 does not disclose the additional features of granted claim 6.

Reasons for the Decision

1. The appeal of the opponent is admissible.
2. *Background*

The invention concerns a method of operating a fuel evaporative emission control system in a plug-in hybrid vehicle. The vehicle comprises a gasoline fuel tank, a fuel vapour vent passage from the fuel tank to a fuel vapour adsorption canister, a first air and fuel vapour flow passage from the canister for venting it and a second air and fuel vapour flow passage from the canister for passing purge air and purged fuel vapours from the canister. That system as such is known.

However, the invention lies in the following steps C1 to C3 of controlling the system by means of valves provided in the first and second air and fuel vapour flow passages:

C1 - opening the first and second air and fuel vapor passages during engine operation;

C2 - opening the first air and fuel vapor passage, but not the second air and fuel flow passage, when the vehicle is not operating and the gasoline is being added to the fuel tank; and

C3 - closing both of the first and second air and fuel vapor passages for preventing diurnal vapor generation and preventing bleeding of fuel vapor from the canister when the vehicle is not in operation and when the vehicle is in operation but the gasoline engine is not being operated.

Thereby, diurnal vapours are prevented from escaping the system, which need to be adsorbed in the canister in order to meet governmental emission standards; see paragraph 6 of the published patent specification.

3. *Admissibility of the requests*

3.1 Claim 1 of the Main Request (patent as granted) and of the 1st Auxiliary Request (the auxiliary request not admitted by the opposition division) do not contain the following features of claim 1 of the 2nd Auxiliary Request:

wherein the vehicle comprises a computer control module (14) for operation of the evaporative emission control system (10), the control module (14) acquires temperature and pressure data of the fuel in the fuel tank (18) at predetermined times during vehicle operation; the control module (14) compares fuel temperatures and fuel tank pressures taken at a first time and at a second later time to determine whether there is a fuel vapor leak from the fuel tank (18) or canister (50).

Due to the absence of these features, these requests are not restricted to a method of operating a fuel evaporative emission control system in a plug-in hybrid vehicle equipped with a computer control module. This results in a broadening of claim scope vis-a-vis the claims upheld by the opposition division. After withdrawal of the proprietor's appeal, the Main Request and the 1st Auxiliary Request therefore contravene the prohibition of reformatio in peius (cf. G4/93 and G9/92). Hence, the board does not admit the Main Request and the 1st Auxiliary Request.

3.2 The 3rd to 5th Auxiliary Requests were not filed with the appeal. Further, neither the proprietor's statement of grounds of appeal nor its reply to the opponent's statement of grounds of appeal contains any arguments with regard to these requests. The board gave the

following preliminary view (paragraph 5 of the board's communication):

"Depending on the outcome of the assessment of the main request and auxiliary requests 1 and 2, auxiliary requests 3-5 might also need to be examined. The board would like to remind the parties that such an examination will only be carried out within the framework of the parties' submissions."

The proprietor in its letter withdrawing its appeal did not comment on the board's preliminary view. In the absence of such comments, the board concludes that these requests have not been substantiated. In accordance with established jurisprudence, unsubstantiated auxiliary requests cannot be considered in appeal proceedings (CLBA, 9th edition 2019, V.A. 4.12.5). The board therefore decides not to admit the unsubstantiated 3rd to 5th Auxiliary Requests, Article 12(4) RPBA 2007.

3.3 For these reasons, only the 2nd Auxiliary Request meets the requirements of Article 12(2) RPBA 2007, and thus will be taken into account by the board pursuant to Article 12(4) RPBA 2007.

4. *2nd Auxiliary Request - Inventive Step*

4.1 The appellant opponent disputes the decision's finding that the subject-matter of claim 1 of the 1st auxiliary request in opposition (which is identical with claim 1 of the 2nd Auxiliary Request in appeal) involves an inventive step.

4.2 It is undisputed that claim 1 of the 2nd Auxiliary Request is a combination of granted claims 1, 5 and 6. In its communication, the board dealt with granted

claim 1 in the context of the Main Request, and with granted claims 5 and 6 in the context of the 2nd Auxiliary Request. The board was of the preliminary opinion that the subject-matter of claim 1 of the 2nd Auxiliary Request is rendered obvious by a combination of E2, E5 and E7, based on the following preliminary view (the relevant passages of paragraphs 2 and 4 of the communication are presented below):

"2. Main request - inventive step

In the board's view the most critical lines of argument for inventive step concern a combination of E2 (as closest prior art) and E5.

2.1 ... Instead, E2 seems to be the most promising starting point for the assessment of inventive step, as it relates to the same type of vehicle. In E2, an air and fuel vapour flow passage 24->27 can be opened and closed by purge cut valve 24, while there is no valve in the air and fuel vapour flow passage 23. It seems to be common ground that E2 does not disclose features C1 to C3 of claim 1, and that the objective technical problem underlying these features may be regarded as avoiding bleeding of fuel vapour from the fuel vapour adsorption canister.

2.2 As the problem is not linked to a particular type of vehicle, the skilled person does not seem to restrict himself to plug-in hybrid vehicles. Instead, he will seek a solution in the general field of gasoline powered vehicles, and he therefore would consider documents E1 or E5.

2.3 Document E5 also relates to diurnal vapour generation and bleeding of fuel vapour from the

adsorption canister, see column 1, lines 12-14, 38-40 and 60-66, as well as column 2, lines 22-23 and 35-36. To that effect, E5 discloses a purge valve 16 and a vent valve 11 in the purge line 15 / vent line 17, while allowing unrestricted flow between the fuel vapour adsorption canister 10 and fuel tank 14 for preventing evaporating fuel from being discharged to the atmosphere (column 1, lines 35-40; column 4, lines 10-19).

2.3.1 E5 seems to disclose feature C1 (column 4, lines 30-33). In view of the explicit statement about the purge valve in column 3, lines 6-13, the board is not convinced that there are engine operating conditions other than the preset ones when the purge valves might be closed (proprietor's statement of grounds, item 2.5.2). Concerning the vent valve, operation of the engine induces sub-atmospheric pressure in the intake manifold, creating a vacuum in conduit 19, and in turn opens vent valve 11 if the preset force of bias spring 47 is overcome (column 5, lines 52-62).

With regard to feature C2, it seems to be implicit that air must be allowed to escape from the tank via the first air and fuel vapour passage 17 (and vent valve 11 therein) when gasoline is added, e.g. as a safety precaution for the case of volumetric filling. With regard to the second air and fuel flow passage 15 (and purge valve 16 therein), it seems to be implicit that a car engine is shut down during refueling, see e.g. mandatory statements in this respect on fuel pumps. That fact seems to be implied by E5, where purging is carried out only when the engine is running (column 2, lines 54-58; column 5, line 63 to column 6, line 7). Feature C2 therefore seems to be implicitly disclosed in E5.

2.3.2 In the board's view, the decisive point is whether E5 also discloses feature C3. The board is of the preliminary opinion that feature C3 is unclear, and thus, must be interpreted in the light of the patent. A first cause of unclarity is that closing of the first and second air and fuel vapour passages, or of any passage, does not seem to have any impact on diurnal vapour generation, and therefore does not seem to achieve the claimed effect of preventing such vapour generation. Instead, diurnal vapour seems to be inevitably generated by daytime heating, and thus, independent of whether or not a certain passage is closed (patent in suit, paragraphs 15 and 28).

A second cause is that by-pass line 94 protects the fuel tank from unexpectedly high pressure or vacuum when the corresponding vent valve 72 is closed, thus effectively circumventing said valve (patent, paragraph 24). As by-pass line 94 seems to be a part of the first air and fuel vapour passage, said passage does not seem to be closed unconditionally when the vehicle is not in operation.

The board is therefore inclined to ignore the claimed effect of "preventing diurnal vapor generation" in connection with closure of the passages. Further, feature C3 is interpreted in the sense of a preferential closure of the passages which may be interrupted depending on special circumstances, but not an absolute, unconditional closure.

2.3.3 Turning to E5 and with this reading of feature C3 in mind, the document is seen to disclose closing both of the first and second air and fuel vapour passages for preventing bleeding of fuel vapour from the canister when the vehicle is not in operation (column

2, lines 23 and 24; column 6, lines 8 to 10) by means of normally closed valves 42, 43 (column 2, line 35; column 6, lines 58-60) and valve 16 (column 4, lines 31-33). This closure implicitly also applies to periods when the vehicle is in operation but the gasoline engine is not being operated, since valves 42 and 43 are normally biased into a closed position by springs 47, 49, and valve 16 is only opened when the engine is running above idle speed (column 4, lines 31-33).

As feature C3 seems to allow for occasional opening of the vent passage (see paragraph 2.3.2), it seems to be immaterial that vent valve 11 can also be opened during the period governed by feature C3 (column 6, lines 8 to 37). In particular, valves 42 and 43 protect the fuel tank from unexpectedly high pressure or vacuum, and therefore seem to have the same effect as valve 72 and by-pass line 94 in the patent in suit.

2.3.4 Therefore, a combination of E2 and E5 seems to lead to the invention claimed in claim 1 of the main request in an obvious manner.

4. Auxiliary request 2 - inventive step, documents E7-E10, request for remittal

4.1 It seems to be common ground that the objective technical problems underlying the additional features "acquisition of pressure data of the fuel in the fuel tank" and "comparison of fuel temperatures and fuel tank pressures taken at a first time and at a second later time ..." may be regarded as determining whether there is a fuel vapour leak from the fuel tank or canister, or as determining the tank fuel RVP (patent in suit, paragraphs 9 and 10). It also seems to be undisputed that these problems are not linked to the

problem underlying features C1 to C3 in a synergistic manner, and thus, a combination of three documents may be used for the assessment of inventive step of auxiliary request 2.

4.2 E7 to E10 were filed with the opponent's statement of appeal.

Concerning independent claim 1, E7 seems to be prima facie relevant, as it relates to the simultaneous acquisition of temperature and pressure data in the tank for the determination of fuel vapour leaks from the canister (column 6, lines 35-39; column 8, lines 10-15). ...

4.4 Concerning independent claims 1 and 6, the board construes the feature "fuel temperatures and fuel tank pressures taken at a first time and at a second later time" in the sense that temperature and pressure data is obtained simultaneously on at least two occasions (patent in suit, paragraphs 30 and 34). Exactly that seems to be disclosed in E7 (column 8, lines 10 to 15). The additional features in claim 1 therefore seem to be rendered obvious by E7...

The auxiliary request 2 does not seem to be allowable, since claim 1 does not seem to involve an inventive step over a combination of E2, E5 and E7."

4.3 The proprietor as respondent in its letter withdrawing its appeal did not comment on the board's preliminary view. In the absence of such comments, the board sees no reason to depart from its preliminary view.

5. Hence, contrary to the opposition division's finding, the board considers the subject-matter of claim 1 according to the 2nd Auxiliary Request not to involve an inventive step, Article 56 EPC. The Main Request, as well as the 1st Auxiliary Request and the 3rd to 5th Auxiliary Requests were not admitted by the board. Therefore, the patent must be revoked pursuant to Article 101(3) (b) EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



G. Magouliotis

W. Van der Eijk

Decision electronically authenticated