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Datasheet for the decision of 25 August 2020

Case Number: T 2922/18 - 3.2.01

Application Number: 13862482.0

Publication Number: 2930080

IPC: B60W20/00, B60W10/06, B60W10/08, B60W20/10, B60K6/48

Language of the proceedings: EN

Title of invention:
TORQUE DISTRIBUTION METHOD FOR ENGINE AND MOTOR OF ENERGY-EFFICIENT HYBRID ELECTRIC VEHICLE

Applicant:
Saic Motor Corporation Limited

Headword:

Relevant legal provisions:
EPC Art. 84, 111(1)
RPBA 2020 Art. 11

Keyword:
Claims - clarity - main request (yes)
Appeal decision - remittal to the department of first instance (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 2922/18 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 25 August 2020

Appellant: (Applicant)	Saic Motor Corporation Limited Flat 509 Building No.1 Songtao Road No.563 Zhangjiang High-Tech Park Shanghai 201203 (CN)
Representative:	Sharman, Thomas Alexander Reddie & Grose LLP The White Chapel Building 10 Whitechapel High Street London E1 8QS (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 6 July 2018 refusing European patent application No. 13862482.0 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Pricolo
Members:	J. J. de Acha González
	O. Loizou

Summary of Facts and Submissions

I. The appeal of the applicant lies against the decision of the Examining Division refusing European patent application 13862482.0.

II. In its decision the Examining Division found that claim 1 of the main request, and of the auxiliary requests as well, did not meet the requirements of Article 84 EPC.

In a communication pursuant to Rule 100(2) EPC dated 26 March 2020 the Board presented its preliminary view of the case. In particular, the Board pointed out that claim 1 of the main request, which is identical to the main request underlying the contested decision, was clear (Article 84 EPC) even if it was to be read broadly and not as restrictively as done by the appellant.

III. Oral proceedings by videoconference, as requested by the appellant, were held before the Board on 25 August 2020.

IV. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request, alternatively on one of the auxiliary requests I to V, all filed with the statement of grounds of appeal.

V. Claim 1 of the main request is identical to claim 1 of the main request underlying the decision under appeal and reads as follows:

"A method for distributing torque between an engine and an electric motor for an energy efficiency improvement of hybrid electric vehicles, comprising:

A. providing an offline Brake Specific Fuel Consumption (BSFC) map of the engine in all operating states, wherein the offline BSFC map illustrates contours of BSFC values of the engine with a horizontal axis thereof representing rotational speed of the engine and a vertical axis thereof representing torque of the engine, and the all operating states include operating states in which the rotational speed of the engine ranges from 0 to n_{Eng}, and for each rotational speed the torque of the engine ranges from 0 to T_{Eng_max}, where n_{Eng} represents a maximum rotational speed the engine can reach, and T_{Eng_max} represents a torque of external characteristic for each corresponding rotational speed, where the torque of external characteristic T_{Eng_max} is a net torque obtained by subtracting a frictional torque from an indicated torque of the engine;

B. enabling the engine and the electric motor to collaboratively respond to a demanding torque T_D during traveling, wherein the engine and the electric motor work in cooperation at a same rotational speed so as to achieve an improved working efficiency; and

C. acquiring a current State Of Charge (SOC) of a power battery mounted on the vehicles, and distributing a torque generated by the engine T_{Eng_pre} and a torque generated by the electric motor T_{Mac_pre} as follows:

c1. if the SOC is greater than a first preset value, entering a first distribution mode, which means: if $T_D < T_{Mac\_maxCAN}$, setting $T_{Eng\_pre} = 0$ and $T_{Mac\_pre} = T_D$,

and if $T_D > T_{Mac\_maxCAN}$, setting $T_{Mac\_pre} = T_{Mac\_maxCAN}$ and $T_{Eng\_pre} = T_D - T_{Mac\_maxCAN}$, where T_{Mac_maxCAN} is a maximum torque constraint value of the electric motor acquired in real time via an in-vehicle network; otherwise, maintaining a current working state; or

c2. if the SOC is less than a second preset value, where the second preset value is not equal to the first preset value, entering a second distribution mode, which means:
setting $T_{Eng\_pre} = T_{BSFC}$ and $T_{Mac\_pre} = T_D - T_{BSFC}$, where T_{BSFC} represents a torque of the engine corresponding to a lowest specific fuel consumption value in a current rotational speed of the engine, and T_{BSFC} is acquired from the offline BSFC map; and otherwise, maintaining the current working state."

Reasons for the Decision

1. Main request - clarity

Claim 1 of the main request is clear (Article 84 EPC).

The Examining Division argued (see point II.1 of the grounds of the impugned decision) that the wording of claim 1 allowed "*two possible ways of interpretation of the subject-matter of claim 1 representing fundamentally different subject-matter, and therefore the requirements of 84 EPC were not met*". According to a first interpretation of feature B and c1, "*the engine and the electric motor may, in certain conditions, work in cooperation at a same rotational speed, but also may, in other conditions, work at a different rotational speed, wherein the respective conditions are*

not defined". Alternatively "*feature (B) may be literally interpreted as the engine and the electric motor always rotate at the same speed*" (see point II.1 of the grounds).

The Board takes a different view.

Feature B of claim 1 reads "enabling the engine and the electric motor to collaboratively respond to a demanding torque TD during traveling, wherein the engine and the electric motor work in cooperation at a same rotational speed so as to achieve an improved working efficiency".

Thus, according to this wording, the method enables - i.e. makes possible, allows, permits - the claimed collaboration of the engine and the electric motor at a same rotational speed but it does not limit the operation of the engine and the electrical motor at always the same rotational speed. In this context it is noted that, for a skilled person, the rotational speed of the engine, and the rotational speed of the motor correspond to the speed of each respective main shaft. During oral proceedings the appellant submitted that the term "enabling" was possibly a translation error and the intended meaning would rather be "making". Still, in the Board's judgment, this would not change the interpretation of claim 1. In fact, as long as at some point during operation the engine and the motor collaboratively respond to a demanding torque by both running at same rotational speed, feature B is fulfilled (irrespective of which term be it "enabling" or "making" is used).
Consequently, the subject-matter of claim 1 does not exclude that, when carrying out the claimed method, the rotational speed of the engine and that of the

electrical motor are different at some point as long as a cooperation at a same rotational speed is achievable at some other point. It is worth noting that a method in which the rotational speeds are always the same also falls under the wording of claim 1.

The appellant submitted that feature B could only be read as requiring the engine and the electric motor to rotate always at the same speed. Here as well, the Board takes a different view. As noted above, claim 1 does not define that the engine and the electric motor always rotate at the same speed. This would require some sort of connection (e.g. a mechanical connection) between their shafts such that their speeds always match. It belongs however to common general knowledge that hybrid vehicles comprising an electric motor and an engine collaborating for providing torque may exhibit clutches and transmission gearboxes connecting the output of both sources of power to the traction wheels. Consequently, the hybrid electric vehicle of the application may include these and therefore modes of operation where the rotational speed of the engine and that of the motor are not necessarily (always) the same. For instance, a clutch may allow a transitory phase in which the two shafts are disconnected, and thus the engine and the electrical motor rotate at different speeds, and a phase in which the two shafts are connected and the engine and the electrical motor rotate at the same speed. The appellant acknowledged that the specific arrangement of the engine and of the electric motor in the vehicle is not disclosed in the whole application. According to the applicant, there was no reason why the skilled person would consider that a clutch or a gearbox might be present between the engine and the electrical motor if none was described. This argument is not convincing because by not

disclosing any specific arrangement of the engine and of the electric motor in the vehicle the application leaves open how these are arranged. In other words, the application leaves open whether there is some sort of fixed connection or whether there is a connection allowing also different speeds, such as a clutch or a gearbox. Both possibilities fall under the wording of claim 1, which accordingly defines various possibilities, i.e. claim 1 is broader in scope than what the appellant intends, but this does not render the matter for which protection is sought unclear in the sense of Article 84 EPC. Finally, it is noted that the question of when, how and for how long the phase of cooperation is done, is left open in the claim. However, this also does not render the claim unclear in the sense of Article 84 EPC but simply broad in terms.

As a consequence, the sole reason for the refusal of the main request by the Examining Division does not hold and the decision is to be set aside.

2. Remittal to the Examining Division

The impugned decision is only based on Article 84 EPC for the subject-matter of independent claim 1 of the main request.

Under Article 111(1) EPC the Board of Appeal may either decide on the appeal or remit the case to the department which was responsible for the decision appealed.

Under Article 11 RPBA 2020 (Rules of Procedure of the Boards of Appeal OJ EPO 2019, A63) the Board may remit the case to the department whose decision was appealed if there are special reasons for doing so.

The Board holds that such special reasons are immediately apparent in the present case as the contested decision does not deal with the issues of novelty and inventive step (Article 54 and 56 EPC) for any of the requests that were considered.

Under these circumstances and further considering that the appellant did not object to a remittal, the Board considers it appropriate to remit the case to the Examining Division for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution on the basis of the claims of the main request filed with the statement of grounds of appeal.

The Registrar: The Chairman:

A. Vottner G. Pricolo

Decision electronically authenticated