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Datasheet for the decision of 15 June 2023

Case Number: T 1993/21 - 3.5.02

Application Number: 14153358.8

Publication Number: 2770619

IPC: H02K29/08, H02K11/215, H02K21/22

Language of the proceedings: EN

Title of invention:
Motorcycle with a rotating electric machine

Applicant:
Yamaha Hatsudoki Kabushiki Kaisha

Relevant legal provisions:
EPC Art. 84
RPBA 2020 Art. 13(2)

Keyword:
Claims - main request and auxiliary request 1 - support in the description (no)
Amendment after summons - auxiliary request 2 - exceptional circumstances (no)

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Case Number: T 1993/21 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 15 June 2023

Appellant: (Applicant)	Yamaha Hatsudoki Kabushiki Kaisha 2500 Shingai Iwata-shi, Shizuoka 438-8501 (JP)
Representative:	Grünecker Patent- und Rechtsanwälte PartG mbB Leopoldstraße 4 80802 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 9 June 2021 refusing European patent application No. 14153358.8 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	R. Lord
Members:	H. Bronold
	A. Bacchin

Summary of Facts and Submissions

I. The appeal of the patent applicant is against the decision of the examining division refusing European patent application No. 14 153 358.8 *inter alia* for lack of support in the description according to Article 84 EPC.

II. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request or, alternatively, the auxiliary request, both filed with letter dated 21 April 2021, as underlying the appealed decision, or on the basis of auxiliary request 2 filed during the oral proceedings before the board.

III. In a communication under Article 15(1) RPBA the board informed the appellant *inter alia* that it tended to the opinion that claim 1 according to both the main request and according to the auxiliary request as underlying the appealed decision was not supported by the description contrary to the requirements of Article 84 EPC.

IV. Oral proceedings before the board were held on 15 June 2023.

V. Claim 1 according to the main request reads:

"A vehicle comprising:
an engine (E);
a rotating electric machine mounted to the engine (E), the rotating electric machine comprising:

a rotor (30) including a rotor yoke part (RY) and a permanent magnet part (37) provided to the rotor yoke part (RY), the rotor yoke part (RY) being mounted to a crankshaft (5) of the engine (E) and configured to rotate together with the crankshaft (5);
a stator (40) including teeth (43) on each of which a winding is wound, the stator (40) being arranged such that the teeth (43) are opposed to the permanent magnet part (37) with respect to a radial direction of the crankshaft (5); and
a magnetic detection device (51 to 54), characterized in that
the magnetic detection device (51 to 54) including a magnetic flux input surface (DP) that is arranged so as to cross an axial direction of the crankshaft (5) and arranged at a distant position with respect to the axial direction of the crankshaft (5) from an end surface of the permanent magnet part (37a) and from an end surface of the teeth (43c),
the magnetic detection device (51 to 54) being configured to detect magnetic fluxes that are emitted from the permanent magnet part (37) to a gap space between the end surface of the teeth (43c) and the magnetic flux input surface (DP) with respect to the axial direction of the crankshaft (5) and inputted in the axial direction of the crankshaft (5) from the gap space to the magnetic flux input surface (DP)."

VI. Claim 1 according to the auxiliary request is further specified *inter alia* in that the vehicle is a motorcycle and that the electric machine is configured to function as a starter generator. Moreover, claim 1 contains the following feature of claim 1 according to the main request in unamended form:

"the magnetic detection device (51 to 54) including a magnetic flux input surface (DP) that is arranged so as to cross an axial direction of the crankshaft (5) and arranged at a distant position with respect to the axial direction of the crankshaft (5) from an end surface of the permanent magnet part (37a) and from an end surface of the teeth (43c)"

VII. The wording of auxiliary request 2 is not represented here because the board decided to exercise its discretion under Article 13(2) RPBA not to take auxiliary request 2 into account.

VIII. The appellant's arguments which are of particular relevance for the decision are detailed below together with the reasons for the decision.

Reasons for the Decision

1. Admissibility of the appeal - Article 108 EPC and Rule 99 EPC

The appeal was filed in due form and time and at least in part sufficiently substantiated. Therefore, the appeal is admissible.

2. Main request - Article 84 EPC

2.1 The appellant argued that the invention claimed in the main request was fully supported by the description, because the fact that the detailed embodiment included a plurality of magnetic detection devices related to further improvements of the claimed invention, not to the invention actually claimed in claim 1 according to the main request.

2.2 The board does not agree with the appellant. The application as originally filed defines in paragraph [0015] as its technical problem:

"*to provide ... a vehicle ... able to detect a rotational position of a rotor with an improved detection accuracy*".

Claim 1 according to the main request and according to the auxiliary request merely defines a magnetic device including a magnetic flux input surface that is arranged so as to cross an axial direction of the

crankshaft of the vehicle's engine in order to detect axial components of leakage flux.

2.3 Contrary to the appellant's arguments, this definition is not limited to a more or less perpendicular arrangement of the magnetic detection device. While it is true that the person skilled in the art would most likely position the magnetic flux input surface close to the permanent magnets of the rotor and in perpendicular orientation with respect to the crankshaft, claim 1 does not contain any corresponding limitation. The details of the geometrical implementation of the magnetic detection device are completely left open in claim 1, as already argued by the examining division in the contested decision under point 7.1.4 on page 9, penultimate paragraph and pointed out in the board's preliminary opinion dated 31 March 2023. Consequently, and in the absence of any definition of the position and orientation of the magnetic detection device according to claim 1, the board is not convinced that the effect of improved accuracy as argued by the appellant is realised by the claimed subject-matter.

2.4 The assumption of the appellant that it was most likely that the person skilled in the art would position the magnetic detection device close to the gap space and more or less perpendicular to the axis of the crankshaft does not mean that corresponding features can be interpreted as limiting the subject-matter of claim 1.

2.5 As a matter of fact, neither the position of the magnetic detection device nor the angle of the magnetic flux input surface is defined in claim 1 other than

being "distant" and "arranged so as to cross an axial direction of the crankshaft", respectively.
The corresponding feature in claim 1 reads:

"arranged at a distant position with respect to the axial direction of the crankshaft (5) from an end surface of the permanent magnet part (37a) and from an end surface of the teeth (43c)"

Without any detailed geometric implementation it cannot be derived how the desired improved detection accuracy could be achieved.

Therefore, the subject-matter of claim 1 does not include the technical features necessary for solving the technical problem defined in the application.

2.6 In contrast thereto, the described embodiment, for example according to paragraph [0077], includes such technical features as the use of four magnetic detection devices wherein the magnetic flux input surfaces of the first to third magnetic detection devices are arranged "between the lateral protrusions 43b of adjacent teeth 43 at an interval of electrical angle 120° corresponding to the windings W that are arranged in the circumferential direction" and the magnetic flux input surface of the fourth magnetic detection device is arranged "at a position overlapping an outer circumferential surface of the peripheral wall 34 of the rotor yoke RY when seen in the axial direction of the crank shaft". For the described absolute position detection, the fourth magnetic detection device seems to be indispensable because it is arranged to detect a notch in the rotor yoke. However, none of these features is claimed.

2.7 The specification does not comprise any other embodiment which would provide the described detection accuracy while using a single magnetic detector whose position relative to the rotor is undefined, as it is in claim 1. The described embodiment comprises four magnetic detection devices arranged in a specific manner and it is not conceivable for the person skilled in the art, how the postulated technical problem could be solved using merely a single magnetic detection device, as claimed. Therefore, the specification does not comprise an embodiment for the claimed subject-matter and claim 1 cannot be regarded as being supported by the description.

2.8 The questions of whether it is evident for the person skilled in the art how to carry out the invention with a different number of magnetic detection devices, as suggested by the appellant, or whether the device according to document D6 requires only a single magnetic detection device, are irrelevant for the question of support under Article 84 EPC because they relate to the requirement of Article 83 EPC, which is not part of the reasoning in the contested decision and is thus not part of the appeal proceedings (see Article 12(2) RPBA).

2.9 According to another line of argument of the appellant the invention lay in the positioning of the magnetic detection device in axial direction instead of in radial direction and in particular in the vicinity of the permanent magnets and the end portion of the stator teeth. This followed *inter alia* from the introductory part of the description describing the invention.

The appellant in this context referred to paragraphs [0004], [0006], [0007], [0018] and [0020] of the

original description in support of their arguments. However, none of the cited passages contains a statement that supports the appellant's arguments. To the contrary, paragraph [0006] of the description specifies an axial arrangement of magnetic sensors to form part of the prior art already, see page 2, lines 15 to 17 of the original description. Furthermore, the necessity for a more specific positioning of the magnetic detection device is clearly disclosed in the second section of paragraph [0020], which is part of the description relating to paragraph [0016], in which the relevant wording of claim 1 is cited.

2.10 Furthermore, the wording of claim 1 does not support the appellant's argument that the magnetic detection device is positioned in close vicinity of the permanent magnets because it defines the magnetic detection device to be "distant", which does not imply anything with respect to a minimal distance between the permanent magnets and the detection device, but rather the contrary.

2.11 The board is therefore not convinced by the appellant's argument that the invention lies in the change from a radial arrangement to an axial arrangement of the magnetic detection device.

Therefore, the board concurs with the examining division's finding that claim 1 according to the main request is not supported by the description and therefore contravenes Article 84 EPC.

3. Auxiliary request - Article 84 EPC

As far as the auxiliary request (as filed on 21 April 2021) is concerned, claim 1 of this request is directed to a motorcycle and defines the electric machine as being configured to function as a starter generator for starting the engine, but even in these more limited circumstances it is clear that information concerning the absolute position of the rotor would be indispensable for claim 1 according to this request. Moreover, claim 1 according to the auxiliary request contains the features which were found to contravene Article 84 EPC for the main request in unamended form and the additional features of claim 1 according to the auxiliary request obviously do not solve the corresponding problems of the main request, as indicated in the contested decision under section 8.2. Since the appellant has not addressed this section of the contested decision in their statement setting out the grounds of appeal and not presented any further arguments regarding this issue during the oral proceedings before the board either, the board sees no reason to deviate from the examining division's findings.

The board therefore concludes that claim 1 according to the auxiliary request contravenes Article 84 EPC.

4. Auxiliary request 2 - Article 13(2) RPBA

4.1 The appellant argued that exceptional circumstances within the meaning of Article 13(2) RPBA existed in the change of the focus of the technical discussion during the oral proceedings before the board. According to the appellant, the focus of discussion shifted from the

question whether a claim directed to a single magnetical detection device is supported by the description to the question of whether a claim directed to a specific location for a single magnetical detection device is supported by the description.

Moreover, according to the appellant claim 1 according to auxiliary request 2 was suitable to overcome all outstanding objections, brought the case forward, thus contributing to procedural efficiency and represented a development of the proceedings. It was therefore admissible. Further, the preliminary opinion of the board was focused on the number of magnetic detection devices. Only during the discussion at the oral proceedings before the board, had it become clear that the feature missing in claim 1 was the actual position of the magnetic detection device.

4.2 While it is true that the position of the sensor was discussed by the appellant for the first time in the appeal proceedings during the oral proceedings before the board, that was not the first time in the proceedings that this topic had been addressed.

4.3 The examining division discussed the position of the magnetic detection device and the lack of definition of its position in claim 1 already at the oral proceedings held on 29 October 2020, see the corresponding minutes on pages 2 to 6, as well as in the contested decision on page 9. The board had also addressed this objection in its preliminary opinion as set out in the communication under Article 15(1) RPBA and referred there to the corresponding part of the contested decision. Further, the board's preliminary opinion was focused on the number of magnetic detection devices simply because this was the only issue with respect to

which the appellant had presented arguments in a sufficiently substantiated manner in their statement setting out the grounds of appeal. The appellant had also not taken the opportunity to react in a timely manner to the board's objections, particularly with regard to the position of the magnetic detection device, as they did not reply in writing to the board's preliminary opinion.

Therefore, the objection that claim 1 according to both the main request and the auxiliary request did not include a definition of where the magnetic detection device is positioned had consistently been part of the proceedings since the oral proceedings before the examining division.

4.4 The fact that the appellant reacted to this objection for the first time during the oral proceedings before the board can thus not be regarded as exceptional circumstances in the sense of Article 13(2) RPBA, justifying admittance of the present auxiliary request.

The board thus decided to exercise its discretion under Article 13(2) RPBA not to take auxiliary request 2 into account.

5. Conclusion

Given its above conclusions, the board is not in a position to accede to any of the appellant's requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

U. Bultmann R. Lord

Decision electronically authenticated