Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 25 May 2021

Case Number: T 0696/18 - 3.5.02

Application Number: 09179026.1

Publication Number: 2197091

IPC: H02K21/00, H02K1/27

Language of the proceedings: EN

Title of invention:
Interior permanent magnet type brushless direct current motor

Applicant:
LG Electronics, Inc.

Relevant legal provisions:
RPBA Art. 12(2), 12(4)
RPBA 2020 Art. 13(2)

Keyword:
Statement of grounds of appeal (main request) - mere reference to first-instance submission - substantiated (no)
Late-filed argument (main request) - amendments after arranging oral proceedings - justified (no)
Late-filed auxiliary requests - submitted with the statement of grounds of appeal - admitted (no)

Decisions cited:
T 0216/10, T 0355/86, T 0140/88

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 0696/18 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 25 May 2021

Appellant: (Applicant)	LG Electronics, Inc. LG Twin Towers, 20, Yoido-dong, Youngdungpo-gu Seoul 150-721 (KR)
Representative:	Vossius & Partner Patentanwälte Rechtsanwälte mbB Siebertstrasse 3 81675 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 17 October 2017 refusing European patent application No. 09179026.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	R. Lord
Members:	G. Flyng
	W. Ungler

Summary of Facts and Submissions

I. The applicant's appeal contests the examining division's decision to refuse the European patent application 09 179 026.1.

II. The contested decision was based on a set of claims 1 and 2 filed on 21 August 2017, which remains relevant to the appeal proceedings. Claim 1 as filed on 21 August 2017 reads as follows:

"1. An interior permanent magnet type brushless direct current (BLDC) motor comprising:

a stator having a plurality of slots; and

a rotor positioned in the stator, configured to rotate with respect to the stator, and having a rotor core, a plurality of permanent magnets inserted in the rotor core and a plurality of flux barriers;

wherein the plurality of permanent magnets are four, and have different poles alternately located at an outside of a shaft hole of the rotor core,

wherein the rotor core has four permanent magnet insertion portions each having a rectangular section corresponding to each shape of the plurality of permanent magnets, and spaced apart from one another in a circumferential direction of the rotor core,

wherein the plurality of flux barriers are positioned at both ends of each permanent magnet insertion portion to be connected to the permanent magnet insertion portion,

wherein the stator has thirty-six slots and a three-phase distributed winding,

wherein an electrical angle is defined as 360° when each of different magnetic poles N and S of the rotor passes a reference point one time, and

wherein the flux barrier angle is substantially an inner angle between two lines which connect inner edge of the flux barriers to the center of the rotor,

characterized in that

the flux barrier angle of the rotor is in a range between 158° and 162° as the electrical angle."

III. The relevant facts pertaining to the first-instance proceedings may be summarised as follows:

(a) In a communication dated 20 March 2017, annexed to a summons to oral proceedings, the examining division set out that the application did not meet the requirements of Articles 123(2), 84, 83 and 56 EPC.

The deficiencies under Article 84 EPC included that:

- with the feature "wherein the electrical angle is defined as 360° when each of the *[sic]* different magnetic poles N and S of the rotor passes a reference point one time" the definition of the location of the flux barriers *[i.e. flux barrier angle]* was not clear (see section 3.1); and
- claim 1 was missing essential features concerning the "particular shape and location of the permanent magnets and the flux barriers as shown in Fig. 2 and disclosed in page 5 - page 6, line 18" (see section 3.2).

The deficiencies under Article 83 EPC included that:

- "the application *[did]* not disclose any formula that enabled the skilled person to calculate the mechanical angle in between the two flux barriers" *[i.e. flux barrier angle]*; and
- "no dimensions and sizes of the rotor, the permanent magnet and the flux barriers *[were]* given in the application".

(b) With a letter dated 21 August 2017 the applicant replied to the summons, filing an amended set of claims 1 and 2 and presenting counter-arguments under the headings "Article 123(2) EPC", "Articles 83 and 84 EPC" and "Article 56 EPC". The arguments under Articles 83 and 84 EPC (see section 4) concerned the clarity of the feature "wherein an electrical angle is defined as 360° when each of different magnetic poles N and S of the rotor passes a reference point one time" and the definition of the flux barrier angle in electrical and mechanical degrees.

(c) In a telephone call on 21 September 2017 (see result of the consultation dated 13 October 2017) the representative announced that they would not attend the oral proceedings the following day. The examiner informed the representative of the preliminary opinion of the examining division concerning the claims filed with the letter dated 21 August 2017 that:

- Claim 1 failed to meet the requirements of Art. 84 EPC for the same reasons as set out in the summons because it still contained the definition "*wherein an electrical angle is defined as 360° when each of the different*

magnetic poles N and S of the rotor passes a reference point one time" which did not suit a four pole motor and was in contradiction to lines 8 and 9 of description page 7;

- Claim 1 prima facie failed to meet the requirements of Art. 123(2) EPC because only some of the features had been taken from the embodiments pages 5/6 in isolation; and
- without a precise definition in the application of the shape and dimensions of the flux barrier the technical effect of lowering cogging torque would not be achieved. The application did not contain this important information. Therefore, the skilled person was not in a position to carry out the claimed invention (Art. 83 EPC).

(d) In the oral proceedings, which the applicant did not attend, the examining division considered the applicant's request for grant on the basis of the set of claims 1 and 2 filed on 21 August 2017 and decided to refuse the application.

(e) In the reasons for the contested decision the examining division held that the definition in claim 1 that "an electrical angle is defined as 360° when each of the different magnetic poles N and S of the rotor passes a reference point one time" lacked clarity, Article 84 EPC. They considered that for the four pole motor claimed this definition was not only incorrect, but also in contradiction with the correct definition given on page 7, lines 7 and 8 of the application as filed, that "If the rotor has four poles, the electrical angle is 720° when the one-time rotation of the rotor occurs" (emphasis added).

The examining division also held that the application did not disclose the claimed invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art, Article 83 EPC. They considered that in order to put the claimed invention into practice and to achieve the technical effect of lowering cogging torque and back EMF (as shown in Figures 3 and 4 of the application), not only the claimed flux barrier angle but also the form and dimensions of the flux barriers were important. This was evident from the disclosure in document D1 (EP 1 566 876 A1). In the application the flux barriers 126 had salient portions having a round shape, but the application did not contain a precise geometrical definition of that shape. No dimensions and sizes of the flux barriers were disclosed.

IV. With the statement setting out the grounds of appeal the appellant filed sets of amended claims 1 and 2 according to a **main request** and **first to fourth auxiliary requests**.

Claims 1 and 2 of the **main request** are identical to those filed with the letter dated 21 August 2017.

In each of the **first to fourth auxiliary requests** the definition of electrical angle in claim 1 has been amended as follows:

"wherein an electrical angle is defined as ~~360~~ 720° when each of different magnetic poles N and S of the rotor passes a reference point one time".

Claim 1 of the **second auxiliary request** differs from the first auxiliary request in that it has been changed from two-part form to one-part form and the features

defining the flux barriers have been amended as follows:

"wherein the plurality of flux barriers are ~~positioned at~~ extended from both ends of each permanent magnet insertion portion in a radial direction of the rotor core to a circumference side of the rotor core to be connected to the permanent magnet insertion portion, each of the flux barriers having a different shape".

Claim 1 of the **third auxiliary request** differs from the second auxiliary request in that at the end of the features defining the flux barriers the following addition has been made:
"... each of the flux barriers having a different shape and having salient portions having a round shape".

Claim 1 of the **fourth auxiliary request** differs from the third auxiliary request in that at the end of the features defining the flux barriers the following amendments and addition have been made:
"... each of the flux barriers having a different shape ~~and having~~ with salient portions having a round shape, and

each of the flux barriers has a larger width in a circumferential direction of the rotor core than any one of the slots and a smaller width than a double width of the any one of the slots".

V. In respect of the main request, the statement setting out the grounds of appeal merely comprised the following:

"The application is pursued with on the basis of the claims filed with the reply of August 21, 2017.

> As regards original disclosure, clarity, sufficiency of disclosure and patentability, it is referred to the arguments presented in the reply of August 21, 2017."

In respect of the auxiliary requests the statement setting out the grounds of appeal comprised detailed arguments.

VI. The Board summoned the appellant to oral proceedings, setting out their preliminary observations in a communication pursuant to Article 15(1) RPBA 2020 annexed to the summons.

In their preliminary observations the Board noted that in respect of the main request the appellant had merely made reference to the arguments presented in the reply of 21 August 2017 during the first-instance procedure and stated that merely referring generally to submissions made during the first-instance examination proceedings could not be seen as meeting the requirement of Article 12(2) RPBA 2007 to "specify expressly all the facts, arguments and evidence relied on". The Board stated that these unspecified submissions were at present not taken into account in accordance with Article 12(4) RPBA 2007 and that in the absence of substantiation it seemed that the appellant's main request could not be granted.

The Board noted that the auxiliary requests filed on appeal had not been presented in the first-instance proceedings and that as was set out in Article 12(4) RPBA 2007, the Board had the power to hold inadmissible requests which could have been presented in the first-instance proceedings but were not. According to the Board, it seemed that in the present case the appellant

had had ample opportunity to file (auxiliary) requests in the first-instance proceedings to deal with the objections that had been raised, but chose not to do so and chose not to attend the scheduled oral proceedings. This had had the effects that the decision had been limited to the issues of clarity and sufficiency of disclosure, and that patentability had not been addressed. In such circumstances it could be appropriate for the Board to exercise its power under Article 12(4) RPBA 2007 to hold the auxiliary requests inadmissible. The Board noted that the appellant had not presented any reasons why the Board should not do so.

VII. With a letter dated 22 April 2021 the appellant responded to the Board's preliminary observations.

In respect of the main request the appellant submitted that this was the same request as had been considered in the contested decision and that the arguments presented in the reply of 21 August 2017 explicitly related to the objections maintained according to the decision. Furthermore, the appellant presented detailed reasons in support of the main request meeting the requirements of Articles 83 and 84 EPC.

Concerning the admittance of the auxiliary requests, the appellant submitted that during the written procedure before the examining division they had argued against the objections raised and presented what was now the main request, but these arguments apparently had not convinced the Examining Division. Therefore, filing auxiliary requests together with presenting the grounds of appeal should be regarded as a direct reaction to the objections maintained by the examining

division in the decision. The auxiliary requests thus should be admitted to the appeal proceedings.

VIII. Oral proceedings were held before the Board on 25 May 2021.

The appellant (applicant) requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims filed with letter of 21 August 2017 (main request), auxiliarily that the decision under appeal be set aside and a patent be granted on the basis of one of the first to fourth auxiliary requests filed with the statement of grounds of appeal.

In respect of the substantiation of the main request, the appellant submitted the following:

- The examining division had objected under Article 84 EPC to the feature that "an electrical angle is defined as 360° when each of different magnetic poles N and S of the rotor passes a reference point one time" in paragraph 3.1.1 of the annex to the summons to oral proceedings. The appellant (then applicant) had replied to the objection in their submission of 21 August 2017, taking a different interpretation of the feature to that of the examining division. This was reflected in section 13.1.1 of the contested decision, which maintained the same view as taken in the summons, and in section 13.2 of the contested decision, which presented the appellant's interpretation.
- Similarly, the objection under Article 83 EPC regarding the dimensions and sizes of the rotor etc. was raised by the examining division in the annex to the summons (section 4.1), countered in their submission of 21 August 2017 and then

repeated in the the reasons for the decision (sections 14.2 to 14.3.1).

- By referring to their submissions of 21 August 2017 in the grounds of appeal, it was evident that on appeal the appellant was maintaining their position on these issues and asking the Board of Appeal to decide whether they or the examining division were correct - in other words to act as arbiter.
- There was precedent for references to first-instance submissions being admitted in the appeal cases T216/10, T355/86 and T140/88.

In respect of the admittance of the submissions filed with letter of 22 April 2021, the appellant submitted that these submissions did not change the nature of the appeal case; they merely repeated the submissions of 21 August 2017 in different words.

In respect of the admittance of the auxiliary requests the appellant submitted that they had responded appropriately to the examining division's communication annexed to the summons to oral proceedings by filing amendments and arguments prior to the oral proceedings. They had been surprised that the examining division had not found their submissions allowable and had reacted to the reasons set out in the decision (e.g. section 14.1.2) by filing auxiliary requests on appeal.

Reasons for the Decision

1. ***Main request - substantiation and admittance of submissions filed with letter of 22 April 2021***

1.1 Article 12(2), second sentence, RPBA 2007 is applicable in the present case. It requires that the statement of grounds of appeal "set out clearly and concisely the reasons why it is requested that the decision under appeal be reversed, amended or upheld" and that it should "specify expressly all the facts, arguments and evidence relied on".

1.2 In respect of the main request in the present case, the statement of grounds of appeal merely makes reference to the arguments presented in the reply of 21 August 2017 during the first-instance procedure. This mere reference does not fulfil the above-mentioned requirements of Article 12(2) RPBA 2007 for the following reasons.

1.2.1 The contested decision sets out objections under Article 83 EPC that "not only the flux barrier angle but also the form and dimensions of the flux barriers are important" (see section 14.1) and that "the dimensions of the permanent magnets and the rotor size are parameters which have to be known in order to achieve these effects" (see section 14.2). Whilst the applicant's reply of 21 August 2017 had a heading "Articles 83 and 84 EPC", it did not in fact include any arguments relating to the objections under Article 83 EPC in the contested decision. The appellant's allegation that the objection regarding the dimensions

and sizes of the rotor was countered in their submission of 21 August 2017 is not correct. Hence, in merely referring to the reply of 21 August 2017, the statement of grounds of appeal fails to set out the reasons why these aspects of the decision under appeal should be reversed.

1.2.2 In respect of the objection under Article 84 EPC, the contested decision cites the arguments presented in the applicant's reply of 21 August 2017 in paragraph 13.2 and then sets out in paragraph 13.2.1 the reasons why these arguments were not found to be convincing, namely:

> "Applicant appears to understand "when each of different magnetic poles N and S" in the sense of "when two adjacent different magnetic poles N and S". This wording is however not in claim 1".

In merely referring to the reply of 21 August 2017, the statement of grounds of appeal fails to address this further reasoning in the contested decision and thus fails to set out the reasons why this aspect of the decision under appeal should be reversed.

1.3 Thus, even if the reference to the first-instance submissions (reply of 21 August 2017) were to be taken into account, the statement of grounds of appeal would not address all of the findings in the contested decision. That was not the case in the decisions T216/10, T355/86 and T140/88 cited by the appellant in support of exceptionally admitting the reference to the first-instance submissions.

1.4 For these reasons the Board considered that the main request was not substantiated in the statement of grounds of appeal.

1.5 According to Article 13(2) RPBA 2020, any amendment to a party's appeal case made after notification of a summons to oral proceedings shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

1.6 The submissions in respect of the main request submitted with the letter of 22 April 2021 constitute such an amendment. In particular, the six pages of submissions in section 1.3 in respect of Article 83 EPC bear no relationship to what was submitted in the reply of 21 August 2017, referenced in the statement of grounds of appeal. The argument that these new submissions merely add meat to what was presented in that reply does not stand up. Hence, no cogent reasons have been presented that there are exceptional circumstances which justify the submissions in respect of the main request submitted with the letter of 22 April 2021 being taken into account. The Board therefore decided to exercise its discretion under Article 13(2) RPBA 2020 not to take into account the submissions filed with the letter of 22 April 2021 in respect to the main request.

1.7 In view of the conclusions in sections 1.4 and 1.6 above, the appellant has failed to substantiate the main request, so that the Board has no reason to overturn the decision of the examining division with respect to the present main request.

2. ***First to fourth auxiliary requests - admittance***

2.1 As is set out in Article 12(4) RPBA 2007, which is applicable in the present case pursuant to Article 25(2) RPBA 2020, the Board has the power to hold inadmissible requests which could have been presented in the first-instance proceedings but were not.

2.2 In the present case the appellant had the opportunity in the first-instance proceedings to file amendments to deal with the objections that were raised in the annex to the summons to oral proceedings. The appellant chose with the reply of 21 August 2017 to file only a single request and supporting arguments. The appellant was informed in the telephone call on 21 September 2017 that this request was not considered allowable for various reasons under Articles 83, 84 and 123(2) EPC, some of which had already been raised in the annex to the summons (e.g. the objections concerning the unclear definition of the electrical angle and the absence of dimensions and sizes of the rotor, the permanent magnet and the flux barriers). The appellant chose not to attend the oral proceedings the next day and not to file further (auxiliary) requests. This course of action had the effect that the decision was limited to the issues of clarity and sufficiency of disclosure, with patentability not being addressed.

2.3 In these circumstances the Board considered that the opportunities should have been taken to file auxiliary requests in the first-instance proceedings, and decided to exercise its power under Article 12(4) RPBA 2007 to hold the auxiliary requests inadmissible.

3. ***Conclusion***

In the absence of an allowable request the appeal had to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman:

U. Bultmann R. Lord

Decision electronically authenticated