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**Datasheet for the decision
of 24 October 2022**

Case Number: T 1108/18 - 3.5.02

Application Number: 08728478.2

Publication Number: 2109866

IPC: H01F38/18, H01F27/36

Language of the proceedings: EN

Title of invention:
Shielded Power Coupling Device

Patent Proprietor:
Analogic Corporation

Opponent:
Schleifring GmbH

Relevant legal provisions:
EPC Art. 100(a), 100(c)
RPBA 2020 Art. 13(1), 12(4), 12(6)

Keyword:
Grounds for opposition - added subject-matter (no) - lack of
patentability (no)
Amendment to appeal case - justification by party (no)



Beschwerdekammern

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Case Number: T 1108/18 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 24 October 2022

Appellant: Schleifring GmbH
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 23 February
2018 rejecting the opposition filed against
European patent No. 2109866 pursuant to Article
101(2) EPC.**

Composition of the Board:

Chairman R. Lord
Members: G. Flynn
J. Hoppe

Summary of Facts and Submissions

- I. The opponent's appeal lies from the decision of the opposition division rejecting the opposition against the European patent published as EP 2 109 866 B1.
- II. The following document references are used herein:
E1: US 2006/022785 A1
E3: WO 2006/045274 A1
E15: Fachkunde Elektrotechnik, Europa Lehrmittel, 23. Auflage, 2002, pages 62, 63
E16: JPH03154309A
E17: Translation of E16 by "Patent Translate".
- III. In the contested decision it was found *inter alia* that:
- The content of the patent did not extend beyond that of the application as filed (Article 100(c) EPC).
 - The subject-matter of the sole independent claim 1 of the patent was novel over each of the documents E1 and E3 (Articles 100(a) and 54 EPC).
 - The subject-matter of claim 1 of the patent was not obvious when starting from the document E1 (Articles 100(a) and 56 EPC).
- IV. The following references are used herein for the features of claim 1 of the patent:
- 1** "A shielded power coupling device transferring electric power
 - 1.1** between a stationary member and a rotating member, the shielded power coupling device comprising:
 - 1.2** a) a reluctance-decreasing primary core (115; 230; 330) defining a first primary core recess;

- b) a reluctance-decreasing secondary core (165; 280; 380) disposed adjacent the primary core (115; 230; 330) and defining a first secondary core recess,
- 1.3** the primary core (115; 230; 330) and the secondary core (165; 280; 380) being arranged so as to form core airgaps (102; 302) therebetween permitting relative rotation of the primary core (115; 230; 330) and the secondary core (165; 280; 380) about an axis of rotation;
- 1.4** c) a first electrically conductive primary winding (110) disposed substantially within the first primary core recess;
- 1.5** d) a first electrically conductive secondary winding (160) disposed substantially within the first secondary core recess; and
- 1.6.1** e) a shield comprising first and second shields (120 170) separated by shield airgaps (101) permitting relative rotation of the shields during operation of the shielded power coupling device, and
- 1.6.2** wherein the first and second shields (120, 170) comprise an electrically conductive material and form a continuous electrical path around the axis of rotation;
- 1.7.1** f) wherein a first primary electric current flowing through the first primary winding (110) produces a first secondary electric current flowing through the first secondary winding (160),
- 1.7.2** creating a fringing field (103) at the periphery of the core airgaps (102; 302); and
- 1.8** g) the shield substantially cancels the fringing field (103).*[sic]*
- 1.9** characterized in that the shield airgaps (101) are greater than the core airgaps (102; 302)."

Claims 2 to 14 of the patent are dependent on claim 1.

- V. In the grounds for appeal the appellant (opponent) invoked the grounds that:
- the subject-matter of the patent went beyond the content of the application as originally filed, contrary to Article 100(c) EPC; and
 - the subject-matter of the patent in suit was not patentable contrary to Article 100(a) EPC and Articles 52 to 57 EPC.

Under Article 100(c) EPC, the appellant argued in essence that it was not permissible to extract feature 1.9 (which they referred to as feature 1.8) in isolation from the description of figures 6 to 10 in paragraph [0067] of the application as filed (see its publication WO 2008/094919 A2).

Under Article 100(a) EPC, the appellant argued that the subject-matter of claim 1 of the patent was not novel over document E3, was not novel over document E1, and did not involve an inventive step in view of document E1 and the common general knowledge of the person skilled in the art as demonstrated by document E15 - a document submitted with the grounds of appeal.

The appellant also set out objections to the dependent claims for lack of inventive step based on document E1 combined with various other documents.

- VI. With a further submission of 7 August 2018, filed after the four-month period prescribed in Article 108 EPC, third sentence, the appellant filed documents E16 and E17. The appellant submitted that these documents were *prima facie* highly relevant, arguing that document E16

disclosed all the features of claim 1 and therefore the subject-matter of claim 1 of the patent was not new.

- VII. The respondent (patent proprietor) replied to the appeal with a submission filed 13 November 2018. The respondent submitted *inter alia* that the notice of opposition was inadmissible and that the appeal was inadmissible and not founded, presenting arguments countering those raised by the appellant. The respondent also submitted that the appellant had not brought forward any excuse for the late-filing of documents E16 and E17 and had not made their case regarding *prima facie* relevance.
- VIII. After the parties had developed their arguments in further written submissions, the Board summoned them to oral proceedings, setting out their preliminary observations in a communication pursuant to Article 15(1) RPBA 2020.
- IX. With a submission dated 19 August 2022 the respondent filed a set of claims of an auxiliary request 4. The appellant submitted in a letter of 20 September 2022 that auxiliary request 4 should not be admitted.
- X. Oral proceedings were held on 24 October 2022, with the appellant's representative attending as requested by video link and the respondent's representatives attending as requested in-person. At the end of the oral proceedings the respondent withdrew their requests and objections as regards admissibility of the appeal and the opposition. The appellant confirmed that they did not wish to present or maintain further objections other than those discussed in the oral proceedings.

The appellant (opponent) requested finally that the decision under appeal be set aside and that the European patent be revoked.

The respondent (patent proprietor) requested finally that the appeal be dismissed (main request), or as an auxiliary measure that the patent be maintained in amended form on the basis of one of the auxiliary requests 1 to 3 filed with letter of 12 September 2017, or on the basis of the auxiliary request 4 filed with letter of 19 August 2022.

Reasons for the Decision

Admissibility of the Appeal, Article 108 EPC

1. The appeal is admissible. That was finally not contested by the respondent.

Amendments, Article 100(c) and 123(2) EPC

2. The only question finally at issue under these Articles was whether feature 1.9 of claim 1 of the patent was directly and unambiguously derivable from the description of figures 6 to 10 in paragraph [0067] of the application as originally filed, in isolation from any other features that may be disclosed in combination therein.
3. According to feature 1.9 of claim 1, "the shield airgaps (101) are greater than the core airgaps (102; 302)".

4. Paragraph [0067] of the application as filed reads as follows (emphasis added):

"As can be seen at FIGS. 6 through 10, where the core material is discontinuous at the core airgap (i.e., where flux lines must cross the core-air-core interface(s)), the flux lines that would otherwise be contained (shunted) within the core material leak out to form fringing fields. At FIGS. 6 through 10, note that the core airgap is shown narrower than the shield airgap, this generally being preferred in some embodiments of the present invention where a narrow core airgap may be desirable to improve coupling between primary and secondary sides, reduce leakage inductance, reduce fringing, or the like, but where somewhat wider shield airgap(s) (and to some extent, somewhat wider winding airgap(s)), although not shown as such in the drawings) may be desirable to reduce capacitance, permit looser dimensional tolerances on parts in mutual proximity during rotation, and so forth."
5. Of the various objections considered in the second to fourth paragraphs of section 2.1 of the reasons for the contested decision, only the objection considered in the fourth paragraph was maintained by the appellant, namely that fresh subject-matter was introduced by the omission of the feature of "(and to some extent, somewhat wider winding airgap(s) ...)".
6. As pointed out by the opposition division in the fifth (last) paragraph of section 2.1, in paragraph [0067] of the application as filed this feature is placed in parentheses. The Board concurs with the opposition division's finding that this is an indication to the skilled reader that the feature concerning "somewhat wider shield airgap(s)" may be employed to achieve the

stated advantages of reducing capacitance and permitting looser dimensional tolerances on parts in mutual proximity during rotation without the winding airgap(s) also having to be somewhat wider.

7. For these reasons, the Board came to the conclusion that the ground for opposition under Article 100(c) EPC does not prejudice the maintenance of the patent as granted.

Admittance of Documents E16 and E17 and related submissions

8. Pursuant to Article 25(1) RPBA 2020, Article 13(1) RPBA 2020 is applicable in the present case. Documents E16 and E17 were filed after the appellant had filed their grounds of appeal. According to Article 13(1) RPBA 2020, any amendment to a party's appeal case after it has filed its grounds of appeal or reply is subject to the party's justification for its amendment and may be admitted only at the discretion of the Board. According to Article 13(1) second sentence, Article 12, paragraphs 4 to 6, RPBA 2020 shall apply *mutatis mutandis* and according to the third sentence, the party shall provide reasons for submitting the amendment at this stage of the appeal proceedings.
9. In the present case, documents E16 and E17 could and should have been presented in the first instance proceedings pursuant to Article 12(4) and (6) RPBA 2020. In view of the primary object of the appeal proceedings to review the impugned decision, a party's appeal case shall be directed to the objections on which the decision was based (Article 12(2) RPBA 2020). The Board notes that the same conclusion would have applied under former Article 12(4) RPBA 2007 because the objection under Article 54 EPC was already

discussed in the first instance proceedings and nothing is discernible or argued that could explain why documents E16 and E17 could not have been filed at that stage. Rather, the appellant did not provide any reasons which would justify the documents having been submitted for the first time during the appeal proceedings and after expiry of the four-month period prescribed in Article 108 EPC, third sentence. A mere allegation of *prima facie* relevance is not sufficient justification.

10. For these reasons the Board exercised its discretion not to admit documents E16 and E17 and the related submissions into the proceedings.

Novelty, Articles 100(a) and 54 EPC

11. In the grounds of appeal the appellant cited two documents as destroying novelty, namely E1 and E3.

12. *Document E3*

- 12.1 The appellant submitted that the structure of the transponder shown in figure 4 of document E3 was such that fringing fields would emanate from the gap between the opposed cores 24 and the stator 1 would reduce these fringing fields to a significant extent by limiting the angle at which they could emanate. Thus it would substantially cancel them within the meaning of claim 1. The appellant illustrated this by marking up figure 4 as below:

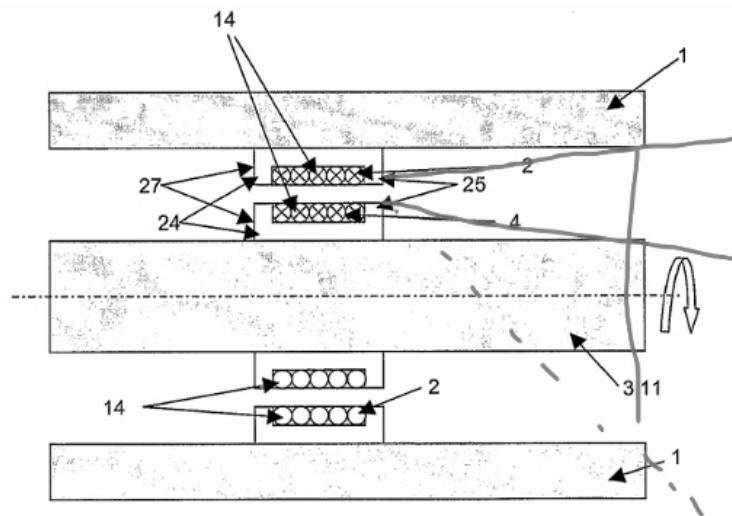


Fig. 4

12.2 The respondent submitted that it was not evident for the skilled person that a low-power transponder such as described in E3 would produce fringing fields as argued by the appellant. If such fringing fields were produced at the core gap, the stator 1 was too far away from the gap to be able to substantially cancel them as claimed.

12.3 Document E3 does not disclose all of the features of claim 1 of the patent. In the abstract, E3 discloses that "The aim of the invention is to provide a transponder system of the aforementioned kind which can be used for self-sufficient sensor applications even in the vicinity of metal materials and noise fields caused by electric motors conventional in mechanical engineering. For this purpose, the surrounding (5) of the read coil (2), especially the stator is produced from a material having little magnetic permeability and good electrical conductivity, preferably aluminum". Whilst it is disclosed that this surrounding (Umgebung 5 in figure 1) and the stator 1 shield the read coil from externally created magnetic fields, there is no suggestion that it would act as a shield which cancels fringing fields created at the periphery of the core

airgaps as required by features 1.8 and 1.7.2 of claim 1 of the patent. As the respondent submitted, no such fringing fields are mentioned in E3 and it is not directly and unambiguously derivable from the structure shown e.g. in figure 4 that the stator would be able to substantially cancel such fringing fields. Whilst the structure in figure 4 might arguably reduce the fringing fields to some extent, the Board does not see this as being the same as the fringing fields being substantially cancelled as claimed.

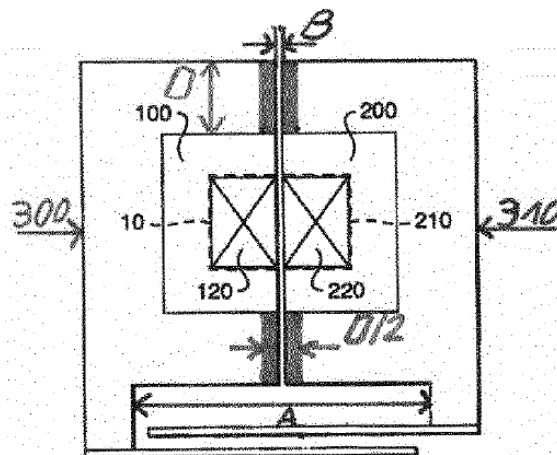
13. *Document E1*

13.1 Document E1 explicitly discloses that the primary and secondary magnetic cores are surrounded by conductive shields (see paragraph [0046]). These are shown in figures 6A to 6C and referenced 300, 310. The structure and technical effect of the shields are described in paragraphs [0047] and [0048] and correspond to what is specified in features 1.6.1, 1.6.2 and 1.8 of claim 1 of the patent. Only feature 1.9 of claim 1 of the patent remains in question.

13.2 Regarding feature 1.9 of claim 1, the appellant referred to the disclosure in paragraph [0050] of document E1, which states:

"To prevent leakage of radiation, the gap between the two halves of the shields 300 and 310 should be less than half the thickness of each shield at the gap".

The appellant submitted a marked-up copy of figure 2B of E1, which is reproduced below.



According to the appellant the possible tolerances of the shield airgap had been drawn in accordance with paragraph [0050] of E1. The shield thickness was indicated by the letter D and a shield airgap of up to D/2 was indicated by shading part of the shields. According to the appellant, this showed that according to E1 the shield airgap could be larger than the core air gap.

13.3 The Board was not convinced by the appellant's arguments in respect of feature 1.9 being disclosed in E1. Whilst E1 discloses in paragraph [0050] that the gap between the two halves of the shields 300 and 310 should be less than half the thickness of each shield at the gap, there is no disclosure that unambiguously links this relationship in paragraph [0050] to the width of the core gap (referenced B in the appellant's marked-up figure above). Whilst one might speculate that the relationship disclosed in paragraph [0050] would allow the shield airgap to be widened (i.e. made wider than the core airgap), one might equally speculate that it would allow the shield thickness to be reduced from that illustrated, to twice the width of the shield airgap as illustrated (i.e. keeping the shield airgap the same width as the core airgap as

illustrated). Hence, feature 1.9 of claim 1 is not unambiguously disclosed in document E1.

14. For these reasons, the Board concluded that the ground for opposition under Articles 100(a) and 54 EPC does not prejudice the maintenance of claim 1 of the patent as granted. The same conclusion applies for the same reasons to the remaining claims of the patent, which are all dependent on claim 1.

Inventive Step, Articles 100(a) and 56 EPC

15. It is not in dispute that document E1 can be taken as the starting point for assessing inventive step. There is however disagreement as to how the objective technical problem(s) solved by the feature 1.9 should be formulated. Furthermore, there is disagreement as to whether it would go against a fundamental teaching of document E1 to make the shield airgaps greater than (i.e. wider than) the core airgaps.

16. For the reasons set out below, the Board came to the conclusion that it would indeed go against a fundamental teaching of document E1 to make the shield airgaps greater than (i.e. wider than) the core airgaps and therefore the questions over the formulation of the objective technical problem(s) could exceptionally be left unanswered.

17. As argued by the respondent, document E1 consistently refers to the conductive shields as surrounding each core. Specifically, document E1 discloses the following:

[0015]: "the invention includes conductive shields surrounding each core";

- [0024]: "power coupling device including metallic shields surrounding each core";
- [0046]: "the primary and secondary magnetic cores are surrounded by conductive shields" and "each of the two magnetic cores are surrounded by aluminum shields 300 and 310";
- [0047]: "By surrounding the cores with shields having appropriate configurations, the oscillating magnetic fields will induce currents in these shields, and these induced currents will tend to cancel these oscillating magnetic fields";
- [0048]: "two continuous, circular half-toroidal shells, which surround each magnetic core 100 and 200".

18. Furthermore, as also argued by the respondent, paragraph [0050] of E1 discloses the following (emphasis added):

"The shields 300 and 310 must be two continuous rings, covering the entire structure. If the structure of the shields 300 and 310 is formed in segments which are not connected to each other electrically, the oscillating magnetic field would create voltages across the gaps, instead of image currents, and there would be no shielding effect. To prevent leakage of radiation, the gap between the two halves of the shields 300 and 310 should be less than half the thickness of each shield at the gap.

19. The Board concurs with the respondent that these disclosures give to the skilled reader the clear and consistent teaching that in order to provide their shielding effect, the shields must "surround each magnetic core" and "cover the entire structure".

20. Furthermore, the Board concurs with the respondent that any attempt, for whatever reason, to modify the coupling device of document E1 to make the shield airgaps greater than the core airgaps would leave a part of the core uncovered, such that the shields would no longer "surround" the cores. It would be evident to the skilled reader that this would be contrary to the explicit teachings in document E1. Hence, such a modification would not be obvious.
21. The appellant submitted that the reference in paragraph [0050] of E1 to the shields covering the entire structure was to be understood merely in the sense that the shields covered the cores in the circumferential direction, rather than being segmented in the circumferential direction like the cores.
22. The Board did not find this convincing. Paragraph [0050] of E1 refers to the shields 300 and 310 being "two continuous rings, covering the entire structure". The reference to "continuous rings" already makes clear that the shields are not segmented. If the reference to them "covering the entire structure" was to be understood in the same sense, it would be superfluous. Furthermore, the literal interpretation of "covering the entire structure" is consistent with the arrangement of the shields as depicted in the figures (see figures 2B and 6C), where the entire outer surface of each core 100, 200 is covered by the shield.
23. The appellant also submitted that the lower part of figure 2B of document E1 showed a part of the shield in which the shield airgap was wider than the core airgap. The appellant indicated this allegedly widened shield airgap as "A" in their marked-up figure that is reproduced in paragraph 13.2 above.

24. Considering this argument the respondent submitted that the skilled person would readily understand that the two protrusions at the right and left lower side of the device shown in figure 2B of document E1 did not contribute to the shielding.
25. On this point the Board concurs with the respondent that the skilled person would not consider the protrusions at the right and left lower side of the device shown in figure 2B of E1 as contributing to the shielding, as they are located too far away from the core and the core airgaps to provide any shielding effect. Hence, the skilled person would not consider the area marked "A" as being a "shield airgap" in the sense of feature 1.9 of the patent.
26. For these reasons, the Board came to the conclusion that the subject-matter of claim 1 of the patent is not rendered obvious by document E1 and that the ground for opposition under Articles 100(a) and 56 EPC does not prejudice the maintenance of claim 1 of the patent as granted. The same conclusion applies for the same reasons to the remaining claims of the patent, which are all dependent on claim 1.

Conclusion

27. As none of the grounds for opposition invoked by the appellant prejudice the maintenance of the patent as granted, the Board acceded to the respondent's main request that the appeal 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