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Datasheet for the decision of 14 March 2024

Case Number: T 0572/21 - 3.5.02

Application Number: 08873468.6

Publication Number: 2266123

IPC: H01F27/42, H02J50/12

Language of the proceedings: EN

Title of invention:
Inductive transmission system

Patent Proprietor:
Powermat Technologies Ltd.

Opponents:
IKEA Supply AG
Bury GmbH & Co. KG

Relevant legal provisions:
EPC Art. 100(a), 54

Keyword:
Novelty - main request (yes)

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Case Number: T 0572/21 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 14 March 2024

Appellant: (Patent Proprietor)	Powermat Technologies Ltd. 94 Em Hamoshavot Road Bldg. Alon B POB 3246 Kiryat Arie Petach Tikva 4970602 (IL)
Representative:	Maiwald GmbH Elisenhof Elisenstraße 3 80335 München (DE)
Appellant: (Opponent 1)	IKEA Supply AG Grüssenweg 15 4133 Pratteln (CH)
Representative:	Industripatent i Växjö AB Box 3130 350 43 Växjö (SE)
Party as of right: (Opponent 2)	Bury GmbH & Co. KG Robert-Koch-Straße 1 32584 Löhne (DE)
Representative:	Gerstein, Hans Joachim Meissner Bolte Patentanwälte Rechtsanwälte Partnerschaft mbB Plathnerstraße 3A 30175 Hannover (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 2 March 2021 concerning maintenance of the European Patent No. 2266123 in amended form.**

Composition of the Board:

Chairman	R. Lord
Members:	C.D. Vassoille
	W. Ungler

Summary of Facts and Submissions

I. The patent proprietor and the opponent 01 filed appeals against the interlocutory decision of the opposition division concerning maintenance of the European patent no. 2 266 123 in amended form on the basis of the second auxiliary request.

II. The following document is relevant for the present decision:

D13: WO 2008/038203 A2 & family member
US 2008/079392 A

III. In the decision under appeal, the opposition division *inter alia* concluded that the subject-matter of claim 1 of the main request and that of the first auxiliary request was not new with respect to document D13.

IV. The board summoned the parties to oral proceedings. In a communication under Article 15(1) RPBA annexed to the summons, the board set out their preliminary observations on the appeal, concluding *inter alia* that the subject-matter of claim 1 of the main request was new over document D13.

V. Oral proceedings before the board took place on 14 March 2024 as a videoconference.

The patent proprietor (appellant) requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the main request, or if that was not possible on the basis of the first auxiliary request, both requests having been filed with letter of 3 December 2019. Further, the

proprietor requested as second auxiliary request that the appeal of opponent 01 be dismissed, or that the patent be maintained in amended form on the basis of either the third or the fourth auxiliary request, both filed with their reply to opponent 01's statement of grounds of appeal.

The opponent 01 (appellant) requested that the proprietor's appeal be dismissed and that the contested decision be set aside and the patent be revoked.

The opponent 02 (respondent) did not file any requests or submissions in the appeal proceedings.

VI. Claim 1 of the main request has the following wording (feature numbering added in squared brackets by the board):

"**[1.0]** An inductive power transfer system (100, 6100, 7100), comprising
[1.1] at least one primary inductor (220, 2220, 5220, 6220, 7220) and at least one secondary inductor (320, 2320, 5122, 6320, 7320), wherein the at least one primary inductor is wired to a power supply (2240, 5240, 6240, 7240) via a driver (230, 2230, 5230, 6230, 7230) and configured to couple with the at least one secondary inductor (320, 2320, 5122, 6320, 7320) to form an inductive couple having a resonant frequency (f_R),
[1.2] and said driver (230, 2230, 5230, 6230, 7230) is configured to provide a driving voltage across said primary inductor (220, 5320),
[1.3] wherein said driver (230, 2230, 5230, 6230, 7230) is operable to select a transmission frequency (f_t) different from said resonant frequency (f_R), said

driving voltage oscillating at a transmission frequency (f_t) higher than the resonant frequency (f_R),
[1.4] wherein said primary inductor (220, 2220, 5220, 6220, 7220) is further wired to a reception circuit (7124) comprising a voltage monitor (7128) for monitoring the amplitude of a primary voltage across said primary inductor (220, 2220, 5220, 6220, 7220), characterized in that
[1.5] said secondary inductor (320, 2320, 5122, 6320, 7320) is further wired to a transmission circuit (7122) for selectively connecting at least one electric element (7126) to said secondary inductor (320, 2320, 5122, 6320, 7320) thereby increasing said resonant frequency (f_R) such that a control signal may be transferred from said transmission circuit (7122) to said reception circuit (7124)."

Claims 2 to 9 are dependent on claim 1.

VII. Independent method claim 10 has the following wording:

"A method for transmitting power by an inductive power transfer system (100, 6100, 7100) according to one of claims 1 to 9, the method comprising:
providing a primary inductor (220, 2220, 5220, 6220, 7220) wired to a power supply (2240, 5240, 6240, 7240) via a driver (230, 2230, 5230, 6230, 7230),
providing a secondary inductor (320, 2320, 5122, 6320, 7320), and
said driver (230, 2230, 5230, 6230, 7230) providing an oscillating voltage to the primary inductor (220, 2220, 5220, 6220, 7220) at a transmission frequency (f_t) which is different from the resonant frequency (f_R) of the system,
monitoring the amplitude of a primary voltage across said primary inductor (220, 2220, 5220, 6220, 7220) by

a voltage monitor (7128) of a reception circuit (7124), wherein the reception circuit (7124) is wired to said primary inductor (220, 2220, 5220, 6220, 7220), and selectively connecting at least one electric element (7126) by a switch (7125) to said secondary inductor (320, 2320, 5122, 6320, 7320) for increasing said resonant frequency (f_R) such that a control signal may be transferred from said transmission circuit (7122) to said reception circuit (7124)."

Claims 11 to 14 are dependent on claim 10.

VIII. The patent proprietor's arguments can be summarised as follows:

The subject-matter of claim 1 of the main request was new in view of document D13, since none of features 1.3, 1.4 and 1.5 was directly and unambiguously derivable from document D13. The same applied to the subject-matter of independent method claim 10.

IX. The opponent 01's arguments can be summarised as follows:

The subject-matter of claim 1 of the main request was not new with respect to document D13, since all features of claim 1, in particular also features 1.3, 1.4 and 1.5, were directly and unambiguously derivable, at least implicitly, from that document.

The detailed arguments of the parties are discussed in the reasons below.

Reasons for the Decision

1. *Qualification of document D13 as prior art under Article 54(2) EPC*

The opposition division considered that the priority of 24 July 2008 (US 129859 P) was the earliest priority that was validly claimed with respect to the subject-matter of claim 1 of the main request. Consequently, the opposition division considered document D13, published on 3 April 2008, to constitute prior art within the meaning of Article 54(2) EPC (see point 2.3.1 of the decision under appeal).

The patent proprietor did not dispute these findings of the opposition division, and the board sees no reason to deviate from them.

2. *Main request - Novelty (Article 54 EPC)*

2.1 Feature 1.3

According to feature 1.3 of claim 1 of the main request, the driving voltage oscillates at a transmission frequency different from the resonant frequency. A corresponding feature is present in the independent method claim 10. From feature 1.1 of claim 1 it is further clear that feature 1.3 refers to the resonant frequency of the inductive couple, which is formed by the primary and the secondary inductor. Correspondingly, method claim 10 refers to the "resonant frequency (f_R) of the system".

The opposition division, in accordance with the opponent 01's argument, found that feature 1.3 was directly and unambiguously disclosed by figure 3 in combination with paragraph [0038] of document D13 (reference is made here and in the following to family member US 2008/0079392 A1).

The board does not share this view. Rather, the board agrees with the patent proprietor that the relevant disclosure of document D13 is not unambiguous in the sense that the skilled person would not understand from paragraph [0038] in conjunction with figure 3 of document D13 anything other than that the driving voltage oscillates at a transmission frequency different from the resonant frequency of the inductive couple, as required by feature 1.3 in conjunction with feature 1.1 of claim 1 and the corresponding feature of independent method claim 10.

Paragraph [0038] and figure 3 refer to a power transfer efficiency curve, and it is clear from what is disclosed in paragraph [0038] that it refers to the power transfer efficiency of the entire system, and thus to a coupled state of the primary coil 15 and the secondary coil 30. Moreover, in the graph of figure 3, the power transfer efficiency is plotted on the Y-axis and the frequency on the X-axis, and paragraph [0038] states that the power transfer is highest when the inverter is operated "at resonance", but significant power transfer can still occur "off-resonance".

However, paragraph [0038] does not explicitly say which resonant frequency is meant in this context, i.e. that of the tank circuit 12, which is part of the charger circuit 6, or that of the overall system including the primary coil 15 and the secondary coil 30, as required

by feature 1.3 of claim 1. In this context, the board notes that it is evident that a skilled person would not equate the resonant frequency of the tank circuit with the resonant frequency of the system as a whole. Thus, all arguments to the contrary do not convince the board.

It is therefore questionable whether the skilled person, at least in the context of an implicit disclosure, could not have derived from paragraph [0038] in conjunction with figure 3 anything other than that the resonant frequency of the inductive couple is referred to in this paragraph.

The board is convinced that there is no corresponding implicit disclosure present in paragraph [0038] in connection with figure 3 of D13. From a technical point of view, it cannot be excluded that, with appropriate tuning of the primary and secondary tank circuits, maximum power transfer efficiency can be achieved if the inverter is operated at the resonant frequency of the tank circuit 12. A corresponding understanding of the resonant frequency in paragraph [0038] is therefore by no means excluded. Moreover, a corresponding interpretation of the disclosure of paragraph [0038] is entirely consistent with the further disclosure of document D13 and would not be rejected as implausible by a skilled person for this reason either.

In this context, the patent proprietor also correctly argued that paragraph [0038] expressly refers to *the inverter* being operated at resonance (or "off-resonance"), and the operation of the inverter is referred to in document D13 consistently in relation to the resonant frequency of the tank circuit 12 and not of the system as a whole. In particular, reference is

made in several passages to the resonant frequency of the tank circuit 12, wherein the tank circuit is described to be part of the charger circuit 6 (see for example paragraphs [0015], [0017], [0056], [0057] as well as claim 11). On the other hand, document D13 makes no reference to the resonant frequency of the system at all, i.e. to that of the inductive couple.

As the patent proprietor correctly argued, the skilled person would read and understand the document as a whole and would therefore not consider individual passages in isolation. However, even if the skilled person were to interpret paragraph [0038], considered in isolation, as meaning the resonant frequency of the overall system in the context of a technically sensible interpretation, further reading of document D13 would lead them to the conclusion that this understanding contradicts the further disclosure of document D13, which otherwise consistently refers exclusively to the resonant frequency of the tank circuit 12. They would therefore instead consider a different technical interpretation of paragraph [0038] and figure 3, in particular one in which the resonant frequency referred to in paragraph [0038] is that of the tank circuit 12 of the charger circuit 6. As explained above, such an interpretation may not be the norm, but it is by no means technically absurd.

For these reasons, the board concluded that paragraph [0038] of D13, in conjunction with figure 3, does not provide an implicit and unambiguous disclosure in the sense that the skilled person would understand nothing other than that this passage refers to the resonant frequency of the system and thus of the coils 15 and 30 in a coupled state.

Therefore, the board considered feature 1.3 not to be disclosed in document D13. The same applies to the corresponding feature of method claim 10.

2.2 Feature 1.4

Feature 1.4 of claim 1 of the main request requires that the primary inductor is wired to a reception circuit comprising a voltage monitor for monitoring the amplitude of a primary voltage across the primary inductor.

The board agrees with the patent proprietor that document D13 does not directly and unambiguously disclose a voltage monitor for monitoring the amplitude of the primary voltage across the primary inductor as required by feature 1.4.

The disclosure of document D13, in particular in paragraphs [0034] and [0039], with respect to a voltage monitor does not meet the requirements for a direct and unambiguous disclosure. Unambiguously disclosed in D13 is only a current measuring device (see paragraph [0034]: "...the feedback detector 82 detects the current in the tank circuit 12". Even if a voltage would be returned by the peak detector in order to measure the current (paragraph [0039]), as argued by the opposition division, this does not correspond to a direct and unambiguous disclosure of providing a voltage monitor within the structural meaning of feature 1.4. The same applies to the statement in paragraph [0034] of D13 that other characteristics of the power in the charger circuit may be evaluated.

Nor can the board agree with opponent 01's argument that it was not possible to monitor a current without

monitoring a voltage, so that feature 1.4 was implicitly disclosed in document D13. Rather, the board knows from its own experience that the skilled person would have been well aware of current monitoring/ measuring techniques which do not require a voltage to be monitored, e.g. via magnetic field measurement. Against this background, the well-known fact that there is a general dependency between current and voltage is also irrelevant.

Since document D13 contains no explicit or implicit references to monitoring the amplitude of a primary voltage across the primary inductor by means of a voltage monitor, the question of whether there is a difference between monitoring and measuring could be left unanswered.

Figure 6E of the patent, to which opponent 01 referred in the oral proceedings before the board, does not contain anything that would contradict the above in relation to voltage measurement as defined in feature 1.4.

Therefore, the board concluded that document D13 does not directly and unambiguously disclose feature 1.4 of claim 1 of the main request. The same applies to the corresponding feature of method claim 10.

2.3 Feature 1.5

Feature 1.5 of claim 1 of the main request also cannot be derived from document D13 in a direct and unambiguous manner.

Feature 1.5 requires that the secondary inductor is wired to a transmission circuit for selectively

connecting at least one electric element to the secondary inductor thereby increasing said resonant frequency such that a control signal may be transferred from the transmission circuit to the reception circuit.

The board cannot recognise a clear correlation between the current surge in the secondary coil, which according to paragraph [0037] creates a corresponding current surge in the primary coil, and a possible change in the resonant frequency. As convincingly argued by the patent proprietor, the current surge in the primary coil that is detected in document D13 by means of the peak detector could also be the result of a transient effect, as is described in paragraph [0037] of document D13. As such, it may not necessarily affect the resonant frequency of the inductive couple such that a control signal may be transferred from said transmission circuit to the reception circuit. Document D13 does not disclose anything to this effect. This also applies with regard to the disclosure of the flanks in figure 6, to which opponent 01 referred in the oral proceedings before the board.

However, even if the board were to agree with the opponent 01 that the current surge described in document D13 affected the resonant frequency of the system, the board still does not see that this implies *an increase* in the resonant frequency, as explicitly required by feature 1.5.

Therefore, in any event, document D13 does not contain any direct and unambiguous disclosure, either explicit or implicit, to the effect that the connection of the secondary coil 30 to the resistor 44 (see figure 5), which corresponds to the at least one electrical element within the meaning of feature 1.5, causes an

increase in the resonant frequency of the inductive couple such that a control signal may be transferred from said transmission circuit to the reception circuit.

Consequently, the board concluded that document D13 does not disclose feature 1.5 of claim 1 of the main request. The same applies to the corresponding feature of method claim 10.

The above finding of the board applies notwithstanding the technical expert opinion submitted by the patent proprietor with the statement of grounds of appeal (expert declaration from Itay Sherman, chief technology officer of Powermat Technologies Ltd.), the admittance and evidential value of which it is therefore not necessary to discuss.

It is further noted that the board's conclusions are based on all the arguments presented by the opponents, including those made allegedly for the first time during the oral proceedings before the board, so that also their admittance could be left open.

2.4 Conclusion on novelty

The board concluded that none of features 1.3, 1.4 and 1.5 is directly and unambiguously derivable from document D13 such that the subject-matter of claim 1 of the main request is new with respect to this document. As no other objections under Article 54 EPC were raised by the opponent 01 against the main request, the board further concluded that the main request met the requirement of Article 54 EPC.

3. Result

Since the main request fulfils the requirement of Article 54 EPC and since no further objections were raised against the main request, the board had to accede to the patent proprietor's main request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent in amended form in the following version:

   Claims: nos. 1-14 filed as main request with letter of 3 September 2019

   Description: paragraphs 1-154 of the patent specification

   Drawings: sheets 1/19-19/19 of the patent specification

The Registrar: The Chairman:

U. Bultmann R. Lord

Decision electronically authenticated

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Case Number: T 0572/21 - 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 2 May 2024
correcting an error in the decision
of 14 March 2024

Appellant: (Patent Proprietor)	Powermat Technologies Ltd. 94 Em Hamoshavot Road Bldg. Alon B POB 3246 Kiryat Arie Petach Tikva 4970602 (IL)
Representative:	Maiwald GmbH Elisenhof Elisenstraße 3 80335 München (DE)
Appellant: (Opponent 1)	IKEA Supply AG Grüssenweg 15 4133 Pratteln (CH)
Representative:	Industripatent i Växjö AB Box 3130 350 43 Växjö (SE)
Party as of right: (Opponent 2)	Bury GmbH & Co. KG Robert-Koch-Straße 1 32584 Löhne (DE)
Representative:	Gerstein, Hans Joachim Meissner Bolte Patentanwälte Rechtsanwälte Partnerschaft mbB Plathnerstraße 3A 30175 Hannover (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 16 April 2024 concerning maintenance of the European Patent No. 2266123 in amended form.**

Composition of the Board:

Chairman:	R. Lord
Members:	C.D. Vassoille
	W. Ungler

In the order of the decision, point 2., the date on which the claims were filed should be changed from 3 September 2019 to 3 December 2019.

The Registrar: The Chairman:

U. Bultmann R. Lord

Decision electronically authenticated