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D E C I S I O N
of 12 September 2000

Case Number: W 0013/00 - 3.5.2

Application Number: PCT/US 98/05378

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Title of invention:
Electric motor or generator

Applicant:
Light Engineering Corporation

Opponent:
-

Headword:
-

Relevant legal provisions:
PCT Art. 34(3)
PCT R. 68.2, 68.3(c), (e)

Keyword:
"Lack of unity of invention a posteriori (yes)"
"Invitation to pay additional fees - reasoned (for two fees, yes: for third fee, no)"

Decisions cited:
W 0004/85, W 0011/89, W 0004/94

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: W 0013/00 - 3.5.2
International Application No. PCT/US 98/05378

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 12 September 2000

Applicant:

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Subject of the Decision:

Protest according to Rule 68.3(c) of the Patent Cooperation Treaty made by the applicants against the invitation of the European Patent Office (International Preliminary Examining Authority) to restrict the claims or pay additional fees dated 2 December 1999.

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: F. Edlinger
B. Schachenmann

Summary of Facts and Submissions

I. International patent application PCT/US98/05378 was filed with sixty-four claims. Ten of these claims take the form of independent claims. For the present decision, it suffices to recite four of them:

"1. A device selected from the group of devices consisting of an electric motor, an electric generator, and a regenerative electric motor, the device including a rotor arrangement, at least one stator arrangement, and a device housing for supporting the rotor arrangement and the stator arrangement in predetermined positions relative to one another and for supporting the rotor arrangement for rotation along a predetermined rotational path about a given rotor axis, the stator arrangement comprising:

a) at least one energizable electromagnet assembly including an overall amorphous metal magnetic core and electric coil array which together define at least one magnetic pole piece, the overall amorphous metal magnetic core being made up of a plurality of individually formed amorphous metal core pieces; and

b) a dielectric electromagnet housing for supporting the electromagnet assembly such that the magnetic pole pieces are positioned adjacent the rotational path of the rotor arrangement, the dielectric electromagnet housing having core piece openings formed into the electromagnet housing for holding the individually formed amorphous metal core pieces in positions adjacent to one another so as to form the overall amorphous metal magnetic core; and

c) the electromagnet assembly includes a plurality of pole pieces, wherein each of the pole pieces of the electromagnet assembly is an individually formed amrophous (sic) metal core piece, and wherein at least one of the individually formed amorphous metal core pieces is a toroidal ring forming an electromagnetic yoke magnetic coupling each of the pole pieces to one another."

"28. An arrangement for controlling the rotational speed, efficiency, torque, and power of a device selected from the group of devices consisting of an electric motor, an electric generator, and a regenerative electric motor, the device including a rotor supported for rotation along a predetermined rotor path about a given rotor axis and a stator having a plurality of dynamically activatable and deactivatable electromagnets including amorphous metal magnetic cores, the electromagnets being spaced apart from one another adjacent to the predetermined rotor path such that movement of a particular point of the rotor from a given point adjacent one electromagnet to a given point adjacent the next successive electromagnet defines one duty cycle, the arrangement comprising:

a) a position detector arrangement for determining the position and rotational speed of the rotor relative to the stator at any given time in a duty cycle and producing corresponding signals; and

b) a controller responsive to the signals for controlling the activation and deactivation of the electromagnet of the stator using predetermined device control settings such that, for each duty cycle, the controller is able to control any combination of a

plurality of activation and deactivation parameters in order to control the speed, efficiency, torque, and power of the device."

"41. A device for generating electricity comprising the combination of:

a) a gas turbine engine; and

b) a generator directly driven by the gas turbine engine without reduction gears or other means for reducing the rotational speed at which the turbine engine drives the generator, the generator including a rotor arrangement with at least one rotor super magnet and a stator arrangement with at least one dynamically activatable and deactivatable electromagnet assembly including an amorphous metal magnetic core."

"48. An arrangement for use in an electric generator for conditioning the electrical output of the electric generator, the generator being driven by a input drive device, the generator including a stator assembly having at least one dynamically activatable and deactivatable stator coil and a rotor assembly, the arrangement comprising:

a) a position detector arrangement for determining the position and rotational speed of the rotor assembly relative to the stator assembly at any given time and producing corresponding signals; and

b) a controller responsive to the signals for variably controlling the activation and deactivation of the stator coil such that the electrical output of the generator is conditioned to a desired electrical output without requiring the use of additional electrical power conditioning devices."

II. On 2 December 1999 the European Patent Office (EPO), acting as an International Preliminary Examining Authority (IPEA), pursuant to Article 34(3)(a) and Rule 68.2 PCT, informed the applicant that the application did not comply with the requirement of unity of invention (Rule 13.1, 13.2 and 13.3 PCT), indicated a possibility of restriction which would be in compliance with the requirement and invited the applicant to restrict the claims or to pay three additional examination fees. The annex to the invitation indicated the following reasons:

The claims were considered to include four separate alleged inventions/groups of alleged inventions which were:

Group A (independent claims 1, 21, 53 and 63):

"Devices including, and method of making a device including, an amorphous metal core comprising a plurality of individually formed amorphous metal core pieces, one serving as a yoke and the rest serving pole pieces, and a dielectric housing having openings for receiving and supporting the core pieces."

Group B (independent claims 41 and 42):

"Device and method of generating electricity comprising a gas turbine engine and a generator with a stator having an amorphous metal magnetic core of an unspecified construction."

Group C (independent claims 28 and 35 (sic - but 34 was obviously meant):

"Device and method for speed control of a machine with a stator having an amorphous metal magnetic core of an unspecified construction."

Group D (independent claims 43 and 48):

"Device and method for conditioning the electrical output of a generator with a stator having a stator coil (no mention of an amorphous metal magnetic core)."

Groups A to D were not so linked as to form a single general inventive concept because the only features which group D had in common with any of the other groups A to C were a generator with a stator including an electromagnet and a rotor. This merely corresponded to the basic structure of any prior art generator, known eg from document D1 (US-A-4 392 072). The only additional feature which any two or all three of the groups A to C had in common was that they included an amorphous metal magnetic core of an unspecified construction. But this concept was also known at least from D1.

III. By letter dated 13 December 1999, the applicant paid three additional fees under protest (Rule 68(3)(c) PCT) and argued essentially as follows:

The relationships between the groups A to D were interdependent and involved technical features that defined a contribution which each of the inventions, considered as a whole, made over the prior art. The invention provided a method and arrangement for minimizing the stresses on an amorphous metal magnetic core in an electric machine which eliminated the need for laminating the various layers of the amorphous metal, thereby reducing the internal stresses on the material and increasing the density of the amorphous material within the overall core. In order to take advantage of the high speed switching capabilities of the amorphous metal magnetic material, the invention provided control methods and arrangements that were able to variably control the activation and

deactivation of the electromagnet of an electric machine including an amorphous metal magnetic core by using a combination of a plurality of different activation and deactivation parameters in order to control the speed, efficiency, torque and power of the device.

The device constructed in accordance with the invention included features as specified in claim 1 including sub-groups a) and b), in particular a plurality of individually formed amorphous metal core pieces supported in a dielectric electromagnetic housing.

IV. On 8 March 2000, the IPEA issued a communication pursuant to Rule 68.3(e) PCT informing the applicant that a prior review of the justification for the invitation to pay additional fees had resulted in the requirement of payment of additional fees being upheld. The review panel considered that the reasoning given in the invitation to pay was wholly correct and that the applicant had not identified precisely what the alleged technical relationship between the devices and methods of claim groups A to D was. It was also stressed that groups B and C did not specify any particular features for the amorphous metal magnetic core. The applicant was thus invited under Rule 68.3(e) PCT to pay the protest fee.

V. By fax received on 7 April 2000, the applicant paid the protest fee and essentially repeated the arguments set out in section III above submitting that the protest was entirely justified.

VI. It can be deduced from the payment of the fees under protest and the arguments set out above that the applicant requests reimbursement of all three of the additional fees.

Reasons for the Decision

1. According to the agreement between the EPO and WIPO under the PCT (OJ EPO 1987, 515) and Article 155(3) EPC, the Board of appeal is competent to decide upon the present protest.

2. The protest complies with the requirements of Rule 68.3(c) and (e) PCT and is therefore admissible.

3. If, pursuant to Article 34(3)(a) PCT, the IPEA invites the applicant to restrict the claims to comply with the requirement of unity of invention or to pay additional fees, it must, according to Rule 68.2 PCT, specify the reasons for which the international application is not considered as complying with the requirement of unity of invention.

3.1 According to established jurisprudence of the boards of appeal, before deciding whether the protest is justified, it has to be judged first whether the invitation to restrict or to pay additional fees issued by the IPEA was sufficiently reasoned to enable the applicant to examine whether the request to pay the additional fees was justified. To this end it is necessary to take account of the problem(s) solved by the alleged inventions. Only in exceptional and straightforward cases can a mere list of the different subject-matters constitute a sufficient substantiation (see W 4/85, OJ EPO 1987, 63, point 3; W 11/89, OJ EPO 1993, 225, point 4.1; W 4/94, OJ EPO 1996, 73, point 4.1).

3.2 In line with these decisions, the Board considers that such a list may be sufficient in cases where the skilled person, prima facie, would not perceive a technical relationship among the special technical

features of the different inventions, in the meaning of Rule 13.2 PCT, and would not find an indication to the contrary in the disclosure of the application. If, however, one or more of the same or **corresponding** special technical features (emphasis added by the Board) are involved in different solutions to a common problem which is readily apparent from the application as a whole, the mere listing of common and/or distinguishing special technical features of different groups of inventions is not sufficient to prove that there is no technical relationship among these groups.

4. In the present case, the invitation pursuant to Article 34(3)(a) PCT sets out the technical features which each of the claims of groups A, B, C and D have in common and states that this common concept lacks novelty, being known from D1. The invitation also summarises the distinguishing features of the different groups, without giving explicit reasons as to why there is no technical relationship among these groups.

4.1 The applicant has not contested that the features which have been found to be common to all the groups A to D, ie a generator with a stator including an electromagnet and a rotor, are known in combination, eg from D1. Although electric motors are also covered by certain claims, this distinction is not relevant to the considerations that follow.

4.2 The invitation has correctly set out that group D does not specify amorphous metal magnetic cores. The method and arrangement for conditioning the electrical output specified in claims 43 and 48, which relate to aspects of speed and power control of generators, such as DC brushless motors, prima facie have no technical relationship with a particular core material as specified in the subject-matters of groups A to C. This

is confirmed by the disclosure of the corresponding aspects in the description of the application (see eg page 3, lines 16 to 22, page 10, lines 2 to 7 and page 20, paragraphs 2 and 3) which establishes a link only for stators which comprise an amorphous metal magnetic core in that it sets out the objective to take advantage of the high speed switching capabilities of this material. The applicant has also referred to this objective but has not drawn attention to any corresponding feature in the claims of this group. According to Rule 13.1 and 13.2 PCT, the requirement of unity of invention refers to the inventions as "claimed in one and the same international application" and cannot therefore be justified by special technical features of embodiments disclosed in the application. Since claims 43 and 48 neither directly specify amorphous metal magnetic cores nor contain any corresponding special technical feature, the mere summarising of the common and distinguishing features in the invitation pursuant to Article 34(3)(a) and Rule 68.2 PCT was sufficient in this straightforward case, because there is no indication anywhere in the present application of the presence of special technical features in these claims corresponding to those of groups A to C. The inventions as claimed in group D therefore cannot be considered as so linked with those of groups A to C as to form a single general inventive concept in the meaning of Rule 13.1 PCT.

4.3 The invitation has also correctly expounded that, among groups A to C, only group A specified individually formed amorphous metal core pieces and a dielectric housing having openings for receiving and supporting the core pieces. It can be derived from the description of the prior art in the present application (pages 1 to 3) that electric machines comprising amorphous metal

magnetic cores were known. The invitation mentioned D1 as exemplary evidence. The applicant has not contested this finding.

4.4 Two different aspects are directly derivable from a technical analysis of the claims of these groups. The subject-matters of Group A, on the one hand, refer to the mechanical structure of electric machines and those of groups B and C, on the other hand, refer to the control of electrical characteristics of such machines, in particular by making use of dynamically activatable and deactivatable electromagnets. Although the invitation pursuant to Article 34(3)(a) and Rule 68.2 PCT did not refer to these common aspects of groups B and C, it did make it sufficiently clear that the special housing of the core pieces and the electric control of the machines, prima facie, concern subject-matters which are only linked by their common structural features, in particular amorphous metal magnetic cores, and the description of the present application does not contain an indication to the contrary. The disclosure of the corresponding aspects in the present application (page 3, paragraph 2; page 13, paragraph 1; page 16, paragraph 2 to page 17, paragraph 3; page 19, last paragraph to page 20, paragraph 2) confirms that two different problems are involved, ie minimizing the stresses on an amorphous metal magnetic core and taking advantage of the high speed switching capabilities of the amorphous metal magnetic material. In this particular case, the reasoning given in the invitation is also considered to be sufficient because the main reason for this finding becomes apparent from the indication of the commonly known features and the differing aspects. Since group A, on the one hand, and groups B and C, on the other hand, specify individual solutions of respective ones of these problems and since their common structural features (electric machines with a stator

including an amorphous metal magnetic core) are already known, the two different objectives referred to by the applicant cannot serve as a basis for linking one or more of the same or corresponding special technical features of all three groups so as to form a single inventive concept in the meaning of Rule 13.1 PCT.

4.5 It has already been shown that a technical relationship, in the meaning of Rule 13.2 PCT, may exist between the subject-matters of groups B and C in that claims 41 and 42, on the one hand, and claims 28 and 34, on the other hand, all specify common structural features (dynamically activatable and deactivatable electromagnets including an amorphous metal magnetic core) and corresponding technical features (generator directly driven by a gas turbine engine; controlling the electromagnets responsive to signals derived from a position detector). In this situation it is not sufficient to merely summarise common and distinguishing features of the different groups. Since a possible link (a common objective) is apparent from the claims (and confirmed by the description) between one or more of the same or corresponding technical features, the examination of unity of invention requires a detailed analysis of the technical features that define a contribution which each of the claimed inventions, considered as whole, makes over the prior art, in order to be able to judge whether one or more of the thus identified "special technical features" are involved in a technical relationship among the different inventions.

4.6 Since the IPEA did not give sufficiently detailed reasons in the invitation pursuant to Article 34(3)(a) and Rule 68.2 PCT as to why groups B and C are not so linked as to form a general inventive concept within

the meaning of Rule 13.1 PCT, the invitation to pay an additional fee for each of these groups of claimed inventions is not legally effective.

5. Summarising, the Board finds the protest justified in the meaning of Rule 68.3(c) PCT to the extent that one of the three additional fees required by the invitation pursuant to Article 34(3)(a) and Rule 68.2 PCT was not legally effective. Since the protest was not entirely justified, the protest fee cannot be refunded (Rule 68.3(e) PCT).

Order

For these reasons it is decided that:

1. The protest is partially justified.

2. The refund of one examination fee is ordered.

The Registrar: The Chairman:

M. Hörnell W. J. L. Wheeler