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**Datasheet for the decision
of 25 May 2011**

Case Number: T 0912/08 - 3.5.02

Application Number: 02254585.9

Publication Number: 1276209

IPC: H02K 5/22

Language of the proceedings: EN

Title of invention:

Terminal connection structure of a resolver stator coil

Applicant:

Tamagawa Seiki Kabushiki Kaisha

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 123(2)

Keyword:

"Amendments - isolated features taken from drawings - added subject-matter (yes)"

"Amendments - features originally presented as being conventional incorporated as inventive features in a claim - added subject-matter (yes)"

Decisions cited:

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Catchword:

-



Case Number: T 0912/08 - 3.5.02

D E C I S I O N
of the Technical Board of Appeal 3.5.02
of 25 May 2011

Appellant: Tamagawa Seiki Kabushiki Kaisha
1879, Ooyasumi
Iida-shi,
Nagano-ken (JP)

Representative: Mounteney, Simon James
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 5 October 2007
refusing European patent No. 02 254 585.9
pursuant to Article 97(1) EPC 1973.

Composition of the Board:

Chairman: M. Ruggiu
Members: G. Flynn
E. Lachacinski

Summary of Facts and Submissions

- I. European patent application no. 02 254 585.9 was refused by the examining division on the grounds that:
- the amendments according to the applicant's main request and auxiliary request introduced subject-matter which extended beyond the content of the application as filed, contrary to Article 123(2) EPC, and
 - claim 1 of the main request was not clear, Article 84 EPC.
- II. With a letter dated 13 December 2007, the applicant (appellant) filed notice of appeal against that decision and requested that the decision under appeal to be set aside and that a patent be granted on the basis of amended claims according to a main request and first to third auxiliary requests, which were filed with the letter.

According to the appellant, the main and first auxiliary requests corresponded to those considered in the contested decision.

The independent claim 1 according to the various requests reads as set out below. The remaining claims of each request are dependent on the respective claim 1.

Main Request

"1. A terminal connection structure, arranged upon a resolver stator (2) comprising a stator coil (1) wound around each magnetic pole tooth (20) of said stator (2) through the intermediation of annular insulation caps (21, 22), the terminal connection structure comprising:

a winding and connection portion (5) formed by winding an end portion (3) of said stator coil (1) around a plurality of terminals (4) provided in a peripheral edge portion (25) of said insulation cap (21), said stator coil (1) and said terminals (4) being integrally connected to said winding and connection portion (5) by one of soldering (6) and fusing,

wherein a part of said end portion (3) wound around said terminals (4) to form said winding connection portion (5) is left as a free end portion (30) which is not integrally connected to said terminals (4) by said soldering (6) or fusing, wherein each of said plurality of terminals (4) are of rectangular form in cross-section, characterised in that:

in said cross-section, through a region of each rectangular terminal (4) around which said end portion is wound, the long direction of the terminal extends towards a rotor 1A of the resolver stator (2)."

First Auxiliary Request

"1. A resolver stator (2) comprising a stator coil (1) wound around each magnetic pole tooth (20) of said stator (2) through the intermediation of annular insulation caps (21, 22), and a winding and connection portion (5) formed by winding an end portion (3) of said stator coil (1) around a plurality of terminals (4) provided in a peripheral edge portion (25) of said insulation cap (21), said stator coil (1) and said terminals (4) being integrally connected to said winding and connection portion (5) by one of soldering (6) and fusing,

wherein a part of said end portion (3) wound around said terminals (4) to form said winding connection portion (5) is left as a free end portion (30) which is not integrally connected to said terminals (4) by said soldering (6) or fusing, wherein each of said plurality of terminals (4) are of rectangular form in cross-section and, characterised in that:

the terminals (4) are arranged in exactly two distinct groups, and the terminals (4) of each group are spaced in a different radial and rotational direction relative to a central longitudinal axis of the resolver stator (2)."

Second Auxiliary Request

"1. A resolver stator (2) comprising a stator coil (1) wound around each magnetic pole tooth (20) of said stator (2) through the intermediation of annular insulation caps (21, 22), and a winding and connection portion (5) formed by winding an end portion (3) of said stator coil (1) around a plurality of terminals (4) provided in a peripheral edge portion (25) of said insulation cap (21), said stator coil (1) and said terminals (4) being integrally connected to said winding and connection portion (5) by one of soldering (6) and fusing,

wherein a part of said end portion (3) wound around said terminals (4) to form said winding connection portion (5) is left as a free end portion (30) which is not integrally connected to said terminals (4) by said soldering (6) or fusing,

wherein the terminals (4) are arranged in exactly two distinct groups, and the terminals (4) of each group are spaced in a different radial and rotational direction relative to a central longitudinal axis of the resolver stator (2), the resolver stator further comprising lead wires (27) connected to a base portion (26) of the stator coil, and wherein the two groups of terminals are arranged adjacent to the lead wires (27) at the base portion, the groups being arranged on opposing sides of the lead wires (27) in the rotational direction about the central longitudinal axis of the resolver stator (2)."

Third Auxiliary Request

"1. A resolver stator (2) comprising a stator coil (1) wound around each magnetic pole tooth (20) of said stator (2) through the intermediation of annular insulation caps (21, 22), and a winding and connection portion (5) formed by winding an end portion (3) of said stator coil (1) around a plurality of terminals (4) provided in a peripheral edge portion (25) of said insulation cap (21), said stator coil (1) and said terminals (4) being integrally connected to said winding and connection portion (5) by one of soldering (6) and fusing,

wherein a part of said end portion (3) wound around said terminals (4) to form said winding connection portion (5) is left as a free end portion (30) which is not integrally connected to said terminals (4) by said soldering (6) or fusing,

wherein each of said plurality of terminals (4) are of rectangular form in cross-section, and wherein, in said cross-section, through a region of each rectangular terminal (4) around which said end portion is wound, the long direction of the terminal extends substantially radially relative to a central longitudinal axis of the resolver stator (2)."

III. The appellant filed grounds of appeal with a letter dated 14 February 2008.

The appellant responded to the objections set out in the contested decision, arguing in essence that the amendments did not add subject-matter contrary to Article 123(2) EPC and that the claims as amended were clear, Article 84 EPC, as well as novel and inventive.

IV. The Board summoned the appellant to attend oral proceedings to be held on 25 May 2011. In an annex to the summons the Board set out its preliminary observations on the appeal, expressing doubts that the amendments were in accordance with Article 123(2) EPC.

V. With a letter dated 18 April 2011 the appellant informed the Board that they did not intend to file any written submissions prior to the oral proceedings and did not intend to attend the oral proceedings scheduled for 25 May 2011.

VI. Oral proceedings were held before the Board on 25 May 2011. As had been announced, the appellant did not attend. The Board considered and decided upon the appellant's requests as set out in the letter dated 13 December 2007.

Reasons for the Decision

1. The appeal is admissible.
2. **The originally disclosed "invention"**

According to the application as filed (EP 1 276 209 A1, paragraph [0001]), the invention relates in particular to a novel and improved connection structure of a resolver stator coil in which a part of an end portion of a stator coil wound around a terminal is left as a free end without integrating it with the terminal by soldering or the like, whereby any expansion / contraction caused by a temperature change or a vibration generated in the stator coil is absorbed by this free end, and rupture or breakage of the stator coil is prevented, thereby improving the resolver in terms of reliability.

The whole of the description and claims as filed is concerned solely with this one problem of preventing rupture or breakage of the stator coil due to temperature change or vibration. The Board can find no hint of any other technical problems being considered. Furthermore, just one solution to the stated problem is disclosed, namely the specific manner in which the end portions of the stator coils are wire-wrapped around the terminals, with a portion of the wire-wrapping being left unsoldered (or un-fused) to allow some flexing.

3. **Amendments, Article 123(2) EPC**

3.1 The various versions of independent claim 1 according to the main and first to third auxiliary requests differ from claim 1 as filed *inter alia* by the addition of the following features (feature references (a) to (e) added by the board):

Main Request

- (a) each of the plurality of terminals (4) are of rectangular form in cross-section; and
- (b) in said cross-section, through a region of each rectangular terminal (4) around which said end portion is wound, the long direction of the terminal extends towards a rotor (1A) of the resolver stator (2).

Auxiliary request 1

- (a) each of the plurality of terminals (4) are of rectangular form in cross-section; and
- (c) the terminals (4) are arranged in exactly two distinct groups, and the terminals (4) of each group are spaced in a different radial and rotational direction relative to a central longitudinal axis of the resolver stator (2).

Auxiliary request 2

- (c) the terminals (4) are arranged in exactly two distinct groups, and the terminals (4) of each

group are spaced in a different radial and rotational direction relative to a central longitudinal axis of the resolver stator (2); and

- (d) the resolver stator further comprises lead wires (27) connected to a base portion (26) of the stator coil, and wherein the two groups of terminals are arranged adjacent to the lead wires (27) at the base portion, the groups being arranged on opposing sides of the lead wires (27) in the rotational direction about the central longitudinal axis of the resolver stator (2).

Auxiliary request 3

- (a) each of the plurality of terminals (4) are of rectangular form in cross-section; and
- (e) in said cross-section, through a region of each rectangular terminal (4) around which said end portion is wound, the long direction of the terminal extends substantially radially relative to a central longitudinal axis of the resolver stator (2).

3.2 None of the features (a) to (e) were present in the originally filed claims. Furthermore, there is no mention in the originally filed description of any of the features (a) to (e), of anything similar to them, or of any technical problem to which they might relate. Hence, the Board concludes that the drawings are the only part of the application as filed from which the skilled person could potentially derive any of the features (a) to (e).

3.3 The Boards have generally held that the EPC does not prohibit the amendment of claims to include features from drawings, provided the structure and the function of such features were clearly, unmistakably and fully derivable from the drawings by the skilled person and not at odds with the other parts of the disclosure (Case Law of the Boards of Appeal, 6th edition 2010, III.A.5, first paragraph, emphasis added).

In the present case the Board finds that this proviso is not met by any of the features (a) to (e). Specifically, the Board cannot see how the skilled person would be able to clearly, unmistakably and fully derive the structures of any of the features (b) to (e) or the function of any of the features (a) to (e) from the drawings.

The appellant has argued in respect of the main request that the skilled person would recognise that the spatial arrangement of the terminals (features (a) and (b)) is a deliberate measure directed to the solution of the problem "how to reduce the required space for mounting the terminals". In the Board's view however the skilled person would not unmistakably derive that the long direction of the terminals necessarily extends towards the rotor of the resolver stator, as figure 1 only shows the terminals in rough detail and figures 5 to 8 do not show the relationship of the terminal to the rotor. Furthermore, the Board cannot see why the skilled person would recognise that this arrangement would clearly and unmistakably lead to a reduction in the space required to mount the terminals, particularly

as this problem is not addressed in the application as filed.

In respect of the first and second auxiliary requests, the appellant has argued that the skilled person would recognise that the arrangement of the terminals in exactly two distinct groups (feature (c)) allows a saving of space for the connection portions between the terminals. The Board considers, however, that the skilled person would not unmistakably derive that the terminals are arranged in exactly two distinct groups. Indeed, it seems that the skilled person could equally consider that the terminals are arranged in three pairs. Furthermore, the Board cannot see why the skilled person would recognise that the claimed arrangement would clearly and unmistakably lead to a saving of space for the connection portions between the terminals - a problem not addressed in the application as filed.

In respect of the third auxiliary request, the appellant has argued that the skilled person would recognise that arranging the long direction of the terminal so that it extends substantially radially relative to a central longitudinal axis of the resolver stator (feature (e)) is a deliberate measure to reduce terminal spacing. The Board considers, however, that the skilled person would not unmistakably derive that the long direction of the terminal extends substantially radially, as this does not seem to be the case in figures 5 to 8 and in figure 1 the terminals are only roughly drawn. Again, the Board cannot see why the skilled person would recognise that this

arrangement would clearly and unmistakably lead to a reduction in the space required to mount the terminals.

- 3.4 Another consideration is that the application as filed gives various indications that some of the matter shown in the drawings relates to the prior art rather than to the invention.

In particular, according to the description of some of the drawings (see EP 1 276 209 A1, paragraph [0014], emphasis added):

Fig. 1 is a plan view showing a terminal connection structure of a resolver stator according to the present invention;

...

Fig. 5 is a perspective view showing a stator coil winding and connecting portion in accordance with the present invention and the prior art;

Fig. 6 is a perspective view showing a main portion of Fig. 1;

Fig. 7 is a perspective view showing a conventional winding and connecting portion.

What's more, according to the description of the related art (paragraph [0002]), figs. 5 and 7 show a typical conventional connection structure of the stator coil of the resolver of this type.

The shape of the terminal 4 and its arrangement on the insulation mold 10 are identical in figures 5 to 8. Given that figures 5 and 7 are said to show a conventional structure, the Board concludes that the application presents the shape of the terminal 4 and its arrangement on the insulation mold 10 as being

conventional. Given that figure 6 is said to show "a main portion of figure 1", which shows a resolver stator according to the invention, the Board concludes that the skilled person would derive that the shape of the terminal 4 and its arrangement on the insulation mold 10 in the resolver of figure 1 is conventional. The statement in paragraph [0019] supports this conclusion.

Features (a), (b) and (e) concern the shape and arrangement of the terminals. In view of the conclusions drawn above, the Board finds that, if these features are derivable from the figures at all, then they are only derivable as features which are presented as being conventional (in other words, as prior art).

In the Board's view, an amendment that results in features, which were originally presented as part of the prior art, being then presented as the invention could be damaging to the legal security of third parties relying on the content of the original application and adds subject-matter contrary to Article 123(2) EPC.

In the present case, the features (a), (b) and (e), were originally presented, if at all, as being part of the prior art and the amendments result in them being presented as the invention. The Board finds that this adds subject-matter contrary to Article 123(2) EPC.

- 3.5 A further consideration is whether the requested amendments amount to a non-disclosed intermediate generalisation (see Case Law of the Boards of Appeal, 6th edition, 2010, III.A.2).

Even if it could be demonstrated that the features (a) to (e) were derivable from the drawings of the embodiment, then it would still have to be borne in mind that they have been taken from the drawings of the embodiment in isolation, setting aside all of the other features that they show.

At least in the case of an amendment of a claim by the introduction of a technical feature taken in isolation from the description of a specific embodiment, the Boards have held that this is not allowable under Article 123(2) EPC if it is not clear beyond any doubt for a skilled reader from the application documents as filed that the subject-matter of the claim thus amended provides a complete solution to a technical problem unambiguously recognizable from the application (see T 284/94, OJ 1999, 464). The present Board takes the view that the same considerations apply for features taken in isolation from a drawing of an embodiment.

In the present case, the Board can find no evidence in the application documents as filed that the subject-matter of any of the amended claims 1 according to the various requests provides a complete solution to a technical problem unambiguously recognizable from the application. Furthermore, the appellant has not presented any arguments to the effect. The Board concludes that the requested amendments amount to non-disclosed intermediate generalisations of the original disclosure and are hence not allowable under Article 123(2) EPC.

4. As none of the appellant's requests could form a basis for the grant of the patent, the appeal has to be dismissed.

Order

For the above reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

C. Moser

M. Ruggiu