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D E C I S I O N
of 15 December 1998

Case Number: T 0777/96 - 3.2.1

Application Number: 91301223.3

Publication Number: 0448219

IPC: F16H 61/12, F16H 61/30

Language of the proceedings: EN

Title of invention:
Transmission system solenoid controlled actuator fault detection system and method

Patentee:
Eaton Corporation

Opponent:
Robert Bosch GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 111(1)

Keyword:
"Decision re-appeals - remittal (yes)"

Decisions cited:
T 0326/87

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0777/96 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 15 December 1998

Appellant: (Opponent)
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Representative:
-

Respondent: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 22 July 1996 rejecting the opposition filed against European patent No. 0 448 219 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: F. A. Gumbel
Members: P. Alting van Geusau
V. Di Cerbo

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 448 219 in respect of European patent application No. 91 301 223.3, filed on 14 February 1991 was published on 7 September 1994 (see Bulletin 94/36).

The independent claim 1 of the patent reads as follows:

"1. A system for sensing both open-circuit and closed-circuit faults in a solenoid (1) controlled actuator (11) assembly having a first position when said solenoid (1) is energized and a second position when said solenoid (1) is deenergized, said actuator assembly (11) requiring at least a first period of time to respond to a change in energization of said solenoid (1) by initially moving from one of said first and second positions toward the other of said first and second positions, said actuator assembly including fault sensing means (R4,7; R1,14) effective for sensing only one of a closed-circuit and open-circuit fault in the solenoid 81) in the energized condition of said solenoid (1) and for sensing only the other of a closed-circuit and open-circuit fault in the solenoid (1) in the deenergized condition of said solenoid (1) said system characterized by:

means for determining a selected one of the energized and deenergized conditions for said solenoid (1),

means (5,6) for causing said solenoid (1) to assume the other of the energized and deenergized conditions thereof for a second period of time, said second period of time being shorter than said first period of time,

means for causing said fault sensing means (R4,7; R1,14) to sense for the one of open-circuit and closed circuit faults detectable by said fault sensing means when said solenoid (1) is in said other condition, and

means effective at the conclusion of said second period of time for causing said solenoid (1) to assume the selected condition thereof."

Further independent claims 9, 17 and 25 relate to a method, a multiple speed change gear transmission and a fault detection method for such transmission, respectively, each of these further independent claims comprising the fault detection as defined in claim 1.

II. Notice of opposition was filed by the appellant (opponent) on 7 June 1995 on the grounds of Article 100(a) EPC, i.e. lack of inventive step. In this respect the opposition was supported in particular by the following prior art documents:

D3: US-A-4 589 401 and

D8: DE-A-3 007 464.

III. By a decision announced on 3 July 1996 during oral proceedings and posted on 22 July 1996, the Opposition Division rejected the opposition.

IV. On 29 August 1996 a notice of appeal was lodged against that decision and the appeal fee was paid on the same day. Together with the statement of grounds of appeal, filed on 19 November 1996, the appellant cited document

D9: WO-A-87 07 388.

V. In a communication issued in preparation for oral proceedings the Board noted that although D9 was cited after the 9-month period stipulated in Article 99 EPC it was introduced in response to a specific argument

given in the decision under appeal and appeared to be relevant. Therefore the Board saw no reason to disregard this document.

VI. Oral proceedings before the Board took place on 15 December 1998. During the oral proceedings the respondent filed a new set of claims 1 to 32 corresponding generally to the granted claims 1 to 32 but in which the independent claims 1, 9 and 17 were drafted in the one-part form and contained further features as shown in bold letters in the following text of claim 1 of the amended claims:

"1. A system for sensing both open-circuit and closed-circuit faults in a solenoid (1) controlled actuator (11) assembly **in vehicles** having a first position when said solenoid (1) is energized and a second position when said solenoid (1) is deenergized, said actuator assembly (11) requiring at least a first period of time to respond to a change in energization of said solenoid (1) by initially moving from one of said first and second positions toward the other of said first and second positions, said actuator assembly including fault sensing means (R4,7; R1,14) effective for sensing only one of a closed-circuit and open-circuit fault in the solenoid 81) in the energized condition of said solenoid (1) and for sensing only the other of a closed-circuit and open-circuit fault in the solenoid (1) in the deenergized condition of said solenoid (1), said system **comprising**:

means for determining a selected one of the energized and deenergized conditions for said solenoid (1),

means (5,6) for **repeatedly** causing said solenoid (1) to assume the other of the energized and deenergized conditions thereof for a second period of time, said second period of time being shorter than said first period of time, **which second period is long**

compared to the rise and fall time of the current in the inductive solenoid,

means for causing said fault sensing means (R4,7; R1,14) to sense for the one of open-circuit and closed circuit faults detectable by said fault sensing means when said solenoid (1) is in said other condition, and

means effective at the conclusion of said second period of time for causing said solenoid (1) to assume the selected condition thereof."

The appellant requested setting aside of the decision under appeal and revocation of the patent.

The respondent (patent proprietor) requested that the appeal be dismissed and that the patent be maintained as granted (main request) or, in the alternative, be maintained in amended form on the basis of the claims filed at the oral proceedings (auxiliary request).

VII. In support of its request the appellant essentially relied during the oral proceedings upon the following submissions:

When considering D9 in detail this document in fact disclosed most of the features of the system in accordance with claim 1 of the patent in suit. In particular D9 disclosed determining of open-circuit and closed-circuit faults in a solenoid controlled actuator by checking these faults in the "on" or "off" state of the solenoid, respectively. It further disclosed that for determining these faults a method was used which included the steps of quickly changing to the other operating condition of the solenoid for a period time long enough so as to determine the relevant voltages to be checked but shorter than was necessary to change the operating state of the actuator. The single feature not explicitly shown in D9 was whether the checking during the quick-change to the other operating condition of

the solenoid took place during switching-on or switching-off of the latter. However, such a further step was obvious to the skilled person and in fact known in itself from D8. Therefore, taking into account the common knowledge of the skilled person the system disclosed in D9 would lead the skilled person in an obvious manner to a system comprising the entirety of features of claim 1 of the patent in suit, which consequently lacked an inventive activity as required by Article 56 EPC.

VIII. The respondent disputed the appellant's view and its arguments may be summarised as follows:

Document D9 did not disclose means for determining a selected one of the energized and deenergized condition of the solenoid nor means for causing the solenoid to assume the other of the energized or deenergized conditions thereof, nor means to bring the solenoid back to the selected condition. Moreover, this document failed to discuss a fault like an inner short circuit on the solenoid, but rather concerned determining faults in the whole circuitry. The system disclosed in D8 was unable to detect whether the sensed pulse drop was caused by a circuit breakage or by a short circuit of the load. Furthermore, the system disclosed in D8 relied on fault determining technique based on transient measurement which technique was unsuitable for use in a vehicle environment. Namely, noise caused by the appliances normally installed in a motor vehicle, would make it impossible to achieve reliable measurement results. Therefore the skilled person would not be led to combine teachings of D9 and D8 and, because of the remaining differences not known from any of the documents cited, in any case would not arrive at the system claimed.

Reasons for the Decision

1. The appeal is admissible.

2. *Procedural considerations*

2.1 In accordance with the case law of the Boards of appeal, if a document filed for the first time in opposition appeal proceedings is relevant enough to be taken into consideration, the case should as a rule be remitted under Article 111(1) to the department of first instance so that the document can be examined at two levels of jurisdiction and the parties, in particular the patent proprietor are not deprived of the possibility of subsequent review. The appropriateness of remittal to the department of first instance should be assessed on the merits of the case and particularly if the late filed material puts the maintenance of the patent at risk the case should be remitted to the first instance (see T 326/87, OJ 1992, 522, point 2.2).

2.2 The Board notes that in the oral proceedings the appellant mainly relied upon document D9 and that during the following discussions the full extent of relevance of this newly filed prior art became apparent. In particular when considering the disclosures of page 8 (see in particular lines 8 to 29), in combination with those of page 13, last paragraph and page 14, first paragraph, it becomes clear that closed-circuit as well as open-circuit faults in a solenoid can be determined. Furthermore the fault sensing in one working condition of the solenoid is carried out during a time period long enough that the relevant voltages can be measured but short enough that the solenoid does not change its actuator state (see in particular, page 14, lines 1 to 4). This means that document D9 is more relevant than D3, taken to be

the closest prior art by the Opposition Division, because in contrast to D3 which discloses a system only suitable to check solenoid circuit faults (see paragraph 7.11 of the decision under appeal, with the emphasis on "circuit") D9 discloses both the determination of two different faults of the solenoid itself and additionally involves a checking method comprising a quick change to the other operating condition of the solenoid so as to determine a fault that could not be determined in the initial operating condition.

2.3 The respondent argued that the system disclosed in D9 was essentially conceived to determine faults in the whole switching circuit and that it could anyhow not differentiate between closed-circuit and open-circuit faults of a solenoid.

However, the text on page 8 appears to be clear in that embodiments are envisaged in which the fault determining circuit is able to distinguish between short-circuit and open-circuit faults (page 8, lines 15 to 19) of the resistance RLN, which could be a solenoid (page 14, lines 1 to 7). On page 8, line 27 also a closed-circuit fault is addressed. Therefore it is questionable in what respect the fault conditions specified in claim 1 of the patent differ from those disclosed in D9.

2.4 Clearly in a situation where the newly introduced prior art is more relevant than the prior art considered by the Opposition Division a totally new situation in respect of the assessment of inventive step arises and because of such more relevant prior art the maintenance of the patent is at risk. Therefore, in accordance with

the case law the Board considers in the present case remittal to the first instance imperative so as to not deprive the parties of the possibility of subsequent review.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution.

The Registrar: The Chairman:

S. Fabiani F. Gumbel