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D E C I S I O N
of 10 November 2000

Case Number: T 0581/99 - 3.5.1

Application Number: 91304997.9

Publication Number: 0460892

IPC: G05B 13/02

Language of the proceedings: EN

Title of invention:

A control device for controlling a controlled apparatus, and a control method therefor

Patentee:

HITACHI, LTD.

Opponent:

Siemens AG
VOEST-ALPINE Industrieanlagen GmbH
SMS Schloemann-Siemag AG

Headword:

A control device/HITACHI

Relevant legal provisions:

EPC Art. 56, 83, 84, 100(a), 100(b)

Keyword:

"Sufficiency (yes)"
"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0581/99 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 10 November 2000

Appellant:
(Opponent 01)

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Representative:

-

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(Proprietor of the patent)

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted 7 April 1999
rejecting the opposition filed against European
patent No. 0 460 892 pursuant to Article 102(2)
EPC.**

Composition of the Board:

Chairman: P. K. J. van den Berg

Members: R. Randes
S. C. Perryman

Summary of Facts and Submissions

I. Two appeals have been filed against the decision of the Opposition Division to reject three oppositions against European patent 0 460 892.

II. The patent was granted with two independent claims 1 and 11, and dependant claims 2 to 10 and 12, the independent claims reading as follows:

"1. A system comprising a controlled apparatus and control device (4) for controlling said controlled apparatus;

i) said controlled apparatus comprising:

at least one variable operation device (1), operating means (2) for operating said at least one variable operation device, and detector means (3) for detecting the operation of said at least one variable operation device (1) and for generating a state signal representing said operation;

ii) said control device (4) comprising:

means for storing a pre-set operation pattern for said at least one variable operation device, and for generating a pre-set command signal and a pre-set state signal, and feedback means for detecting the difference between said pre-set state signal and said state signal and for generating a feedback signal for modifying said pre-set command signal to generate a command signal for controlling said operating means;

characterised in that:
the control device has:

analysis means (5) for:

- (i) determining a relationship between at least one of said command signal and said feedback signal and at least one of said state signal and said difference between said state signal and said pre-set state signal, when said feedback signal exceeds said predetermined limit,
- (ii) generating a compensation signal on the basis of said relationship, and
- (iii) further modifying said pre-set command signal on the basis of said compensation signal."

"11. A system comprising a controlled apparatus and control device (4) for controlling said controlled apparatus;

i) said controlled apparatus comprising:

at least one variable operation device (1), operating means (2) for operating said at least one variable operation device, and detector means (3) for detecting the operation of said at least one variable operation device (1) and for generating a state signal representing said operation;

ii) said control device (4) comprising:

means for storing a pre-set operation pattern for said at least one variable operation device, and for generating a pre-set command

signal and a pre-set state signal, and feedback means for detecting the difference between said pre-set state signal and said state signal and for generating a feedback signal for modifying said pre-set command signal to generate a command signal for controlling said operating means;

characterised in that:

the control device has a analysis means for analysing said feedback signal to generate an evaluation signal and for modifying said pre-set command signal and/or said pre-set state signal on the basis of said evaluation signal."

III. In its decision the Opposition Division found inter alia that:

- the invention was disclosed in the published Figures 30 to 40 so that the skilled man would know how to carry out the invention;
- the subject-matter of claims 1 and 11 was novel over all cited prior art, as none of the prior art documents provided any clear disclosure of a system which generates a pre-set command signal and a pre-set state signal by a means which stores a pre-set operation pattern, nor showed an analysed feedback signal as defined in the present invention;
- that the subject-matter of claims 1 and 11 was inventive over document:

E1: (OI-D1) "Control System Design - An

introduction to state-space methods",
Friedland, 1986, ISBN 0-07-022441-2.

- document E1 showed only replacement of a first signal by a second signal which was an estimate of the first signal: there was no suggestion that such replacement would occur for some values but not for all and such a total replacement could not be considered a modification of the first signal by any relationship, nor any indication to proceed in this manner;

- that the subject-matter of claims 1 and 11 was inventive over document:

E11: (OIII-D2) "Digitale Regelsysteme",
Springer-Verlag 1977, Isermann,
pages 391-394 and 430-431.

- nothing in document E11 corresponded to the means for storing a pre-set operation pattern which generated both the pre-set command and the pre-set signal. The distinct nature of these signals did not seem to be disclosed in document E11. Even a combination of the two different systems shown in Figures 23.2a and 23.2b would not lead the skilled man to the subject-matter of claim 11 (or claim 1) since 23.2a referred to a system without a model whereas 23.2b was for a system employing a model. The skilled man would thus not arrive at the claimed subject-matter which was therefore to be regarded as new and inventive.

IV. Appellant 1 (Opponent 01) duly filed a notice of appeal and statement of grounds, requesting that the decision

under appeal be set aside and

as main request that the patent be revoked in its entirety, and

as auxiliary request that the matter be remitted to the Opposition Division with the order that it check to what extent the average skilled person with his average knowledge of the art, using the same standard as for examination of novelty and inventive step, could have derived from the application at the time of filing an embodiment of each of the seven claimed objects which was not in contradiction to other parts of the description.

An initially made auxiliary request for the appointment of oral proceedings was withdrawn by letter dated 13 July 2000.

- V. Appellant 2 (Opponent 03) duly filed a notice of appeal and statement of grounds, requesting that the decision under appeal be set aside and that the patent be revoked in its entirety.

An initially made auxiliary request for the appointment of oral proceedings was withdrawn by letter dated 10 October 2000.

- VI. The Respondent (Patentee) requested

as main request that the appeal be dismissed and that the patent be maintained as granted and

as auxiliary requests that the patent be maintained on the basis of one of the auxiliary requests A or B filed

9 October 2000 or C filed 10 October 2000.

An auxiliary request for the appointment of oral proceedings was also made.

VII. The party as of right (Opponent 02) made no requests or submissions during the appeal proceedings.

VIII. Appellant 1 (Opponent 1) essentially submitted that:

Article 100(b) EPC: Insufficiency

- the patent did not disclose the invention sufficiently since the independent claims and the figures of the patent used different terminology, the content of the patent could not be reproduced without inventive skill;
- as stated in decision T 292/85, in particular point 3.1.5 of the reasons, an invention was only sufficiently disclosed if the skilled person was taught one way of carrying it out, moreover, the same level of skill had to be applied when considering sufficiency and inventive step, as stated in T 60/89 (point 3.2.5 of the reasons);
- the patent failed to teach one way of carrying out the invention, the many alleged embodiments merely confusing the skilled person;
- it was also questionable whether, in the light of Figure 39, Figure 40 embodied the invention at all;

Articles 100(a), 54, 56 EPC: Lack of novelty and

inventive step

- referring only to submissions of 28 May 1997 and 27 November 1998 already made during opposition proceedings, the claims lacked novelty or inventive step over documents E1 and

E2: (OI-D2) Nakakita, Wakisaka, Sumida, J. Soc. Instrum. Control Eng. (Japan): "Applications of knowledge engineering in iron and steel industry", vol. 29, no. 6, pages 527-34, June 1990, Society of Instrum. & Control Eng., Tokyo, Japan, ESEA4 (in Japanese);

- claim 11 lacked inventive step over the following document which had been cited, but not discussed, during opposition proceedings:

E15: (OP1-3) Proceedings of the 1987 American Control Conference, vol. 3, 10 June 1987, Minneapolis, US, pages 1662-1668; Ornedo et al.: "Design and experimental evaluation of an automatically reconfigurable controller for process plants";

- the subject-matter of claim 11 differed from the disclosure of E15 in that the "evaluation signal" was derived from the "command signal" rather than from the "feedback signal", as required by claim 11, however it would be obvious to modify the control system using the feedback signal instead of the command signal so that claim 11 lacked inventive step over E15.

IX. Appellant 2 (Opponent 03) essentially submitted that:

- the claims lacked inventive step in view of document E11:
- the features set out in the preambles of claims 1 and 11 were either known or obvious from Figure 23.1b on page 392 of E11, read in conjunction with the mention on page 391 of the use of computers and microprocessors to implement adaptive controllers.
- signals w, y and e in document E11 corresponded to the preset state, state and feedback signals respectively;
- the adaption algorithm A_R in document E11 was to be regarded as analysis means as defined in claim 1 and 11, the determination of a relationship when the feedback signal exceeded a predetermined limit being a form of "dead-band", these being usual in the control art, for instance, page 393, lines 19 to 20 of E11 mentioned an adaptive controller deciding on adaption, the term "decision" implying that some form of predetermined limit had to be exceeded before adaption took place, and implementing the adaption by adjusting the controller;
- it was implicit that the feedback algorithm received a pre-set command signal;
- the line in Figure 23.1b from the adaption algorithm to the controller represented the generation of a compensation signal to modify a pre-set command signal.

X. The Patentee essentially submitted that:

Sufficiency

- claims usually used broader language than the description, some differences in terminology also being due to the presence of different signals in the "learning" and "ordinary" modes of the invention;
- claim 1 could be read onto Figures 30 to 33 and Figure 40 of the patent and filed a copy of Figure 40 annotated to illustrate how it corresponded to the features of the independent claims;
- column 32, lines 28 to 29 explained that Figure 39 is a modification of the embodiment of Figure 32, hence Figure 39 was not intended to be read together with Figure 40;

Novelty and inventive step

- questioned the relevance of E15, as with reference to Figure 1, even if the output of the system there shown were regarded as a state signal and the reference signal were regarded as a pre-set state signal, there was no disclosure of the difference being derived between the pre-state signal and a state signal or of the means for storing a pre-set operation pattern (the "knowledge base") affecting the pre-set state signal;
- document E11 did not disclose the pre-set command

signal required by claims 1 and 11 and so did not disclose the modification of a pre-set command signal;

- moreover, since the single output of the feedback algorithm modified the feedback signal e in E11 it would be illogical to use the same output to provide a further modification;
- regarding the predetermined limit mentioned in claim 1, the argument that the implementation of a dead-band would result in feedback being turned off was insufficient as claim 1 however required that the pre-set command signal always be modified by the feedback signal. Only if the feedback signal exceeded the predetermined limit was the pre-set command signal further modified on the basis of the compensation signal.

XI. The Board issued a summons to oral proceedings together with an annex containing the preliminary opinion that the Appellants' arguments did not appear convincing.

XII. In response, the first and third Opponents stated in letters dated 16 August 2000 and 10 October 2000 respectively that they would not attend the oral proceedings.

XIII. At the oral proceedings on 10 November 2000, held in the absence of all three Opponents, the Patentee maintained its requests (see point VI).

Reasons for the Decision

1. The appeals are admissible.

Request for remittal to Opposition Division

2. Appellant 1 has made an auxiliary request (see point IV above) that the matter be remitted to the Opposition Division to check on the extent that the average skilled person could derive various matters from the application as filed. Insofar as this request relates to a ground of opposition at all, this would appear to be the ground of Article 100(b) EPC, that the patent does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. Since the Opposition Division has decided that this ground has not been made out, and since it is not alleged that any substantial procedural violation was involved, the Board exercises its discretion under Article 111(1) EPC to decide on this issue itself, without any remittal.

Sufficiency of disclosure

3. The ground of insufficiency must be made out in relation to the invention defined in the claims. This critical issue is not really addressed by Appellant 1's arguments. It appears to the Board that the skilled person in the control system art, which is a well established art, would already be able to put into practice the invention as defined by either claim 1 or claim 11, without having to refer to the description. That the description is not a model of clarity, and gives much detail relating to matters which are not the essence of the invention as defined in the claims does not make out a case of insufficiency. The Board accepts, as argued by the Respondent, that Figure 40

(together with Figures 30 to 33) shows an embodiment which can be carried out which illustrates the invention as claimed in the independent claims. This suffices to reject the ground of insufficiency: that other parts of the description may be difficult to understand is irrelevant.

The prior art relied upon by the Appellants

E1 and E2

4. Appellant 1's statement of grounds refers to arguments made during opposition proceedings based on E1 and E2, as follows: "In bezug auf Neuheit und erfinderische Tätigkeit gegenüber der E1 und der E2 verweist die Einsprechende auf ihren Einspruchsschriftsatz vom 28.05.1997 sowie auf ihren Schriftsatz vom 27.11.1998".
5. In the decision under appeal, apart from the sentence in its point 3 on novelty stating which features none of the documents in the proceedings disclose, document E2, which is in Japanese (a translation has not been provided), is not implicitly or explicitly discussed. No complaint has been made that this amounts to a procedural violation, but the Board has checked on this point. The only reference to E2 found by Board in the opposition submissions referred to, is in the context of a request on page 5 of the submission of 28 May 1997 requesting that the patentee be required to explain which technical features are to be allocated which priority, so that it can be decided whether E2 is also relevant. Thus, there appear to be no arguments concerning E2 in either the opposition proceedings or the appeal proceedings for the Board to consider. The Board would point out that it is up to an opponent to

make a case of invalidity on filing the opposition, and then on appeal to show why the decision under appeal is wrong. Neither has happened here.

6. In relation to document E1, the Appellant 1 has provided no arguments as to why the decision of the Opposition Division was wrong. The Board agrees with that decision that the differences (see point III above) between E1 and the claimed inventions are such as to establish novelty, and that E1 gives no hint towards arriving at what is now claimed.

E15

7. The Board notes that the means for storing a pre-set operation pattern in E15 (the "knowledge base" in Figure 5) does not provide pre-set state or command signals but merely selects between the available control laws. Consequently E15 is less relevant than the other documents already cited during opposition proceedings, in particular E11. Hence the Board exercises its discretion under Article 114(2) EPC not to admit E15 into these proceedings due to lack of relevance.

E11

8. Figure 23.1b of E11 discloses a control device controlling an apparatus having a variable operation device, operating means and detector means, means for generating a pre-set state signal (w) and feedback means for detecting the difference (e) between the pre-set state signal and a state signal (y) from the detector.

9. E11 does not disclose means for storing a pre-set operation pattern for the variable operation device and for generating a pre-set command signal and a pre-set state signal, these signals being defined in claims 1 and 11.
10. Since these difference features are set out in both claims 1 and 11, the Board finds that the subject-matter of claims 1 and 11 is novel over document E11.
11. The Board is also unable to find any incitement in E11 to add the above difference features. Regarding the predetermined limit mentioned in claim 1, the Board notes that the implementation of a dead-band would result in feedback being turned off. Claim 1 however requires that the pre-set command signal always be modified by the feedback signal. Only if the feedback signal exceeds the predetermined limit is the pre-set command signal further modified on the basis of the compensation signal.

Inventive step in general

12. No convincing line of argument has been put forward how, starting from document E1 or E11 or any other document discussed in the proceedings, the skilled person would derive what is now claimed in any obvious manner from the documents in the proceedings as a whole. Even looking at combinations of documents, no incentive appears derivable to modify the suggestions in any one such prior art document so as to arrive at something within the claims. Hence the Board is of the opinion that the ground of lack of inventive step has not been made out in relation to either of the independent claims 1 or 11.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

For the Chairman:

M. Kiehl

R. Randes