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**Datasheet for the decision
of 25 October 2012**

Case Number: T 1987/09 - 3.5.03

Application Number: 03026909.6

Publication Number: 1431853

IPC: G05B 19/418, G06F 17/40,
G05B 23/02, G05D 23/00

Language of the proceedings: EN

Title of invention:
System and method for processing instrumentation and control
data based on a client-server architecture

Applicant:
OMRON CORPORATION

Headword:
Processing instrumentation and control data/OMRON CORPORATION

Relevant legal provisions:
EPC Art. 56
RPBA Art. 12(4), 13(1)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step (main request) - no"
"Admissibility (second and fourth auxiliary requests) - no"

Decisions cited:
-

Catchword:
-



Case Number: T 1987/09 - 3.5.03

DECISION
of the Technical Board of Appeal 3.5.03
of 25 October 2012

Appellant: OMRON CORPORATION
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 25 March 2009
refusing European patent application
No. 03026909.6 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: F. van der Voort
Members: A. J. Madenach
M.-B. Tardo-Dino

Summary of Facts and Submissions

I. The present appeal is against the decision of the examining division refusing European patent application No. 03026909.6 on the grounds that claims 1, 4, 6 and 9 are not clear (Article 84 EPC) and their subject-matter does not involve an inventive step (Articles 52(1) and 56 EPC) having regard to the disclosure of

D1: EP 1 102 185 A

and the common general knowledge.

II. In the statement of grounds of appeal the appellant implicitly requested that the decision of the examining division be set aside and a patent be granted on the basis of a new set of claims 1 to 11 as filed with the statement of grounds of appeal.

III. The board summoned the appellant to oral proceedings. In a communication accompanying the summons, the board gave its preliminary opinion.

IV. In preparation for the oral proceedings the appellant filed with a letter dated 25 September 2012 claims 1 to 11 of a main request, claims 1 to 12 of a first auxiliary request, claims 1 to 12 of a second auxiliary request, claims 1 to 10 of a third auxiliary request, and claims 1 to 10 of a fourth auxiliary request.

V. Oral proceedings took place on 25 October 2012.

In the course of the oral proceedings the appellant withdrew the first and third auxiliary requests. The

appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request, or, alternatively, on the basis of the second or the fourth auxiliary request, all requests as filed with the letter dated 25 September 2012.

After deliberation by the board, the chairman announced the board's decision.

VI. Claim 1 of the main request reads as follows:

"An instrumentation and control information providing method for providing information related to instrumentation and control, comprising:

an application step for a client (3) to submit a service application to a server (2);

a transmission step for said client (3) to transmit to said server (2) through a network (1) instrumentation and control data obtained by measuring and controlling an object of instrumentation and control which is controlled by an instrumentation and control equipment connected to said client (3);

an application receiving step for said server (2) to receive said service application from said client (3);

a receiving step for said server (2) to receive through said network (1) the instrumentation and control data;

a data accumulation step for said server (2) to accumulate said instrumentation and control data;

a processing step for said server (2) to process the accumulated instrumentation and control data in accordance with the received service application; and

a providing step for said server (2) to provide processed information which has been processed in said processing step as said information related to instrumentation and control to said client (3) through said network (1),

wherein services provided by said server (2) in compliance with a request from said client (3) include a data accumulation service for accumulating said instrumentation and control data and providing the accumulated data, and a diagnosis service for checking for a control fault of said instrumentation and control equipment,

wherein said instrumentation and control equipment is a temperature controller (4), and

said instrumentation and control data include at least data on an operation amount for operating said object of instrumentation and control output from said temperature controller (4) to said object of instrumentation and control, and data on a control amount obtained by measuring a temperature of said object of instrumentation and control input to said temperature controller (4);

said services provided by said server (2) in compliance with a request from said client (3) further include a modeling service for modeling said object of instrumentation and control, and a tuning service for providing a control parameter for said instrumentation and control equipment to control said object of instrumentation and control,

said processing step processes at least one of said tuning service, said modeling service and said diagnosis service in accordance with contents of said received service application; and

said tuning service includes a process of modeling said object of instrumentation and control based on said data on the control amount and operation amount to determine a model structure and calculating a PID gain of said temperature controller (4) using said model structure based on said accumulated data;

said modeling service includes a process of modeling said object of instrumentation and control based on said data on the control amount and operation amount to determine a model structure; and

said diagnosis service includes a process of modeling said object of instrumentation and control based on said data on the control amount and operation amount to determine a model structure and checking for a fault using said model structure based on said data on the control amount and operation amount for a normal period and a diagnosis period to generate a diagnosis result."

Claim 1 of the second auxiliary request essentially differs from claim 1 of the main request in that it additionally includes the following feature:

"wherein said tuning service further includes a process of simulating a PID control of said determined model structure using said calculated PID gain based on said data on the control amount and operation amount to produce a simulation output waveform, and providing the produced output waveform to the client (3) for determining whether to select or cancel the tuning service, wherein, upon selection of the tuning service, the calculated PID gain is transmitted from the server (2) to the client (3)".

Claim 1 of the fourth auxiliary request essentially differs from claim 1 of the main request in that it additionally includes the following feature:

"wherein said instrumentation and control data transmitted from said client (3) to said server (2) in said transmission step is compressed data obtained by sampling and holding instrumentation and control data obtained from said object of instrumentation and control at sampling intervals which sampling intervals become smaller in case of the sampled instrumentation and control data being associated with a change beyond a predetermined threshold value or in case of a change of the sampled instrumentation and control data by a predetermined threshold value".

Reasons for the decision

1. *Main request (inventive step (Articles 52(1) and 56 EPC))*
- 1.1 The instrumentation and control information providing method as claimed in claim 1 of the main request essentially relates to a server and a client, both connected to a network, in which the server provides control related services to the client. More specifically, the client sends control data obtained from a control equipment, which itself controls an object, to the server which, upon request or in accordance with the received service application, processes this data and provides various services based on the processed data to the client. In order to perform the above functions the client comprises

communication means and application means and the server comprises communication means, application receiving means, data accumulation means and processing means. The processing in the server includes data accumulation of data received from the client and a diagnosis service for checking for a control fault in the control equipment.

The services provided by the server further include a modelling service and a tuning service. The processing means is adapted to calculate a PID gain of the temperature controller based on a model structure of the object, which is based on the control and operation amount data (tuning service) and is adapted to check for a fault using the model structure (diagnosis service).

The control equipment is a temperature controller and the control data comprises data sent to the object of instrumentation and control (operation amount) and received from this object (control amount). The board notes that in a temperature controller the control amount typically corresponds to the measured temperature values and the operation amount, in an example of a room heating system, to a heating fluid valve position.

- 1.2 Claim 1 can thus be seen as relating to a typical PID control system for temperature control with some higher control functions being performed by a remote server and provided to the client, in which these higher control functions include a modelling service, a tuning service (adapting a PID gain) and a diagnosis service.

1.3 The board considers that at the relevant priority date PID temperature controllers were generally known to the skilled person. This was not contested by the appellant.

Further, according to the application in suit, it was conventional in temperature controlling to record the operation history of a sensor in order to trace the cause of a malfunction (paragraph [0003] of the application as published). In the board's view, tracing the cause of a malfunction is a diagnosis feature. According to paragraph [0004], the known temperature controller could be a PID controller, in which the PID gain was set by the client using an auto-tuning function. The known client could also produce a model of the object to be controlled (paragraph [0005]).

It was not disputed by the appellant that such a temperature controller was known. Hereinafter, the board will consider this PID temperature controller as representing the closest prior art.

1.4 The differences between the claimed method and using the known PID temperature controller are the features which relate to the use of the network and the server as summarised under point 1.1 above.

The board agrees with the appellant that these features solve *inter alia* the problem that the data such as the operation amount and the temperature detected (*i.e.* the control amount) cannot be easily accumulated by the client in view of the need to construct a system using a data logger and instrumentation software (paragraph [0003] of the application as published).

1.5 A similar problem is dealt with in D1 which relates to electric equipment servicing, the equipment consisting, e.g., of motors (see paragraphs [0001] and [0002]). According to D1, the problem encountered with prior art servicing equipment was that it required an additional computer and data logger/tester per client site or a person required to come over with a data logger in order to collect the data (paragraphs [0003] and [0004]).

The solution provided in D1 consists in connecting the client(s) via a network to a server (see the abstract and Figure 1 ("Data Processing System 11")). As a result of the proposed client/server structure, the client comprises communication means (e.g. "Contact Prime Service Provider 58" in Figure 4) and application means (e.g. "Diagnostic Inquiry 66" and/or "Additional Diagnostic Inquiry 76" in Figure 4) and the server comprises communication means (cf. the arrows pointing to "Data Processing System 11" in Figure 1), application receiving means (implicitly from "Analysis 68" and "Analysis 86" in Figure 4), data accumulation means (data base 22, 24 and paragraph [0010]) and processing means (data processing system 11, paragraph [0010]). The server furthermore comprises a diagnostic engine 20 to determine the presence of incipient or actual faults in electrical machinery (paragraphs [0012] and [0019]). Hence, the server is adapted to perform a diagnosis service.

The solution of D1 may also include the transmission of technical data from the client to the server, which includes sufficient information in order to create at the server at least a partial blueprint for the

electric equipment such that the system has a baseline expectation of how the electric equipment works under normal operating conditions (see paragraph [0028]). Thus, the server performs modelling of the control object. The data may be input by the customer or measured and input by sensors (paragraphs [0015] and [0016]) and may additionally include specific information about the electric equipment such as model numbers etc. (paragraph [0014]).

- 1.6 In the board's view, the skilled person would have recognised that the teaching of D1, *i.e.* solving a data logging problem at a client by connecting the client to a remote server which performs the data logging, is useful in solving the same problem encountered with a PID temperature controller and would therefore have considered, starting out from the above mentioned closest prior art and faced with the above-mentioned problem, applying the client/server scheme as known from D1 to the known PID temperature controller.

In the resulting method, the modelling and diagnosis may thus be based on data which includes the control amount data as measured and input by sensors and specific information about the electric equipment (see point 1.5 above, last paragraph).

The board notes that D1 distinguishes between a basic service, according to which data will typically be entered manually, and a more advanced service according to which data regarding operating conditions are obtained via detectors (paragraphs [0015] and [0016]). Further, the board notes that D1 leaves it open whether or not further data, other than data relating to the

operating conditions, which corresponds to control amount data in the present application, and data relating to specific information about the electrical equipment such as model numbers, is used for the diagnostic service outlined in paragraphs [0012] and [0019] and the modelling service outlined in paragraph [0028].

In the known PID controller control is based on control loop feedback which implies weighing the control amount against the operation amount. This means that the operation amount data is present in the controller, *i.e.* the client device. In the light of the problem encountered with the known PID controller, *i.e.* that the data cannot be easily accumulated by the client, it would have been obvious to consider accumulation at the server not only of the control amount data, as directly taught by D1, but also of the operation amount data and to use both sets of data for the diagnosis and modelling services.

With this data and the modelling service present in the server, it would furthermore have been obvious to the skilled person, again in order to avoid data accumulation at the client, to also include the tuning service of the known PID controller in the processing means of the server.

- 1.7 The skilled person would thereby have arrived at the claimed instrumentation and control information providing method without the exercise of inventive skill. The subject-matter of claim 1 of the main request does not therefore meet the requirement of Article 52(1) EPC in combination with Article 56 EPC.

Hence, the main request is not allowable.

2. *Second and fourth auxiliary requests (admissibility)*

2.1 According to Article 12(4) RPBA, the board has the power to hold inadmissible requests which could have been presented in the first instance proceedings. This also applies to requests which were filed after the filing of the statement of the grounds of appeal.

According to Article 13(1) RPBA, any amendment to a party's case after it has filed its grounds of appeal may be admitted and considered at the board's discretion. The discretion shall be exercised in view of, *inter alia*, the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy. Amendments sought to be made after oral proceedings have been arranged shall not be admitted if they raise issues which the board cannot reasonably be expected to deal with without adjournment of the oral proceedings (Article 13(3) RPBA).

2.2 In the present case, the second and fourth auxiliary requests were filed after oral proceedings had been arranged.

2.3 Considering claim 1 of the second auxiliary request (see point VI above), the board notes that the additional feature relates to providing a simulation output waveform to the client for determining whether to select or cancel the tuning service. This feature is only derived from the description (paragraphs [0106] and [0107] of the application as published), since it

was not part of the claims 1 to 20 as originally filed. If the second auxiliary request were admitted, it would therefore have been necessary to remit the case to the first instance for proper search and examination.

The additional feature of claim 1 of the fourth auxiliary request relates to the data transmission between the client and server, namely details concerning the compression of the data. This feature only derives from paragraphs [0122] and [0128] of the application as published. As stated in paragraph [0133] the "data compression method is applicable not only to the instrumentation and control information providing method of this embodiment but also to other cases of data measurement", which is understood by the board as meaning that the data compression in question is not specific to the data transmitted from the client to the server but can also be used in other cases of data transmission. This, however, means that the claimed subject-matter, which was hitherto concerned with the problem that operation and control amount data could not be easily accumulated by the client in view of the need to construct a system using a data logger and instrumentation software, is now further concerned with a data compression method which is not specific to solving this problem. Since this data compression method has never been part of the previously claimed subject-matter and is not specifically related to this previously claimed subject-matter, it gives the present case a completely new direction and would, therefore, have required a remittal to the first instance for proper search and examination.

- 2.4 In view of the above and considering the advanced stage of the proceedings as well as the need for procedural economy, the board exercised its discretion under Article 13(1) and 13(3) RPBA and did not admit the second and fourth auxiliary requests to the proceedings.
3. There being no allowable request, it follows that the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar

The Chairman

L. Fernández Gómez

F. van der Voort