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**Datasheet for the decision
of 19 July 2024**

Case Number: T 0124/22 - 3.5.03

Application Number: 16160611.6

Publication Number: 3070550

IPC: G05B17/02, G05B19/418

Language of the proceedings: EN

Title of invention:

Modeling of an industrial automation environment in the cloud

Patent Proprietor:

Rockwell Automation Technologies, Inc.

Opponent:

Baier, Martin

Headword:

Cloud-modelling of an automation system/ROCKWELL

Relevant legal provisions:

EPC Art. 83

RPBA 2020 Art. 12(8)

Keyword:

Decision in written proceedings - (yes): indication of proprietor's non-attendance - oral proceedings neither necessary nor expedient

Sufficiency of disclosure - all claim requests (no)

Decisions cited:

T 0930/92, T 0149/21

Catchword:

It is no more than the usual degree of courtesy owed to the opposing party's representative and a Board of Appeal that a party's intention not to attend the oral proceedings is communicated as early as possible (see point 1.1 of the Reasons).



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Case Number: T 0124/22 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 19 July 2024

Appellant: Baier, Martin
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Representative: Ellwanger & Baier Patentanwälte
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 17 November
2021 rejecting the opposition filed against
European patent No. 3070550 pursuant to
Article 101(2) EPC.**

Composition of the Board:

Chair K. Bengi-Akyürek
Members: K. Peirs
R. Romandini

Summary of Facts and Submissions

I. The appeal lies from the decision of the opposition division to reject the opposition (Article 101(2) EPC). The opposition division deemed that none of the opposition grounds

- under Article 100(a) EPC in conjunction with Article 52(2)(c) EPC and with Articles 54 and 56 EPC,
- under Article 100(b) EPC and
- under Article 100(c) EPC in conjunction with Article 123(2) EPC

prejudiced the maintenance of the opposed patent in its granted form. Given the opposition division's positive assessment of the claims as granted, none of the proprietor's fifteen auxiliary requests, filed during the opposition proceedings, required consideration by the opposition division.

II. In the appeal proceedings, the parties' requests were as follows:

The appellant (opponent) requests that the appealed decision be set aside and that the patent be revoked.

The respondent (proprietor) requests that the appeal be dismissed as its **main request**. In the alternative, the respondent requests that the patent be maintained in amended form on the basis of one of the **fifteen auxiliary requests** filed during the opposition proceedings.

- III. The parties were summoned to oral proceedings before the board. A communication was issued under Article 15(1) RPBA including the board's negative preliminary opinion regarding sufficiency of disclosure (Article 83 EPC) as regards all claim requests on file.
- IV. By letter of reply, received one day before the scheduled oral proceedings, the respondent stated that it would not be attending the arranged oral proceedings. No substantive submissions were made.
- V. Subsequently, the oral proceedings were cancelled.
- VI. Claim 1 of the **main request**, the **first auxiliary request** and the **eighth auxiliary request** reads as follows (board's feature labelling):
- A) "A system (300), comprising:
- (a) a modeler component (302) on a cloud platform;
 - (b) a mesh network component (340) configured to obtain a set of industrial data from a set of devices (310, 312, 314, 316) of an industrial automation system (306) and communicate the set of industrial data to the modeler component (302) on the cloud platform,
 - (c) wherein respective data is filtered by a segmenter component (352) with regard to data that is to be provided to the modeler component (302) on the cloud platform and data that is not to be provided to the modeler component (302) on the cloud platform based on respective levels of data sensitivity of the data associated with the industrial automation system;
 - (d) and a collection component (308), comprised in the modeler component, configured to collect the set of

industrial data and store the set of industrial data in a data store (318);

- (e) wherein the modeler component is configured to generate (1702) a model of the industrial automation system that corresponds to the industrial automation system, based on a result of an analysis of the set of industrial data."

VII. Claim 1 of the **second auxiliary request** differs from claim 1 of the main request in that feature (b) is replaced by the following feature (board's feature labelling and highlighting, the latter reflecting amendments vis-à-vis feature (b)):

- (f) "a mesh network component (340) configured to obtain and gather a set of industrial data from a set of devices (310, 312, 314, 316) of an industrial automation system (306) and communicate the set of industrial data to the modeler component (302) on the cloud platform via a cloud gateway component (342),".

VIII. Claim 1 of the **third auxiliary request** differs from claim 1 of the main request in that feature (c) is replaced by the following feature (board's labelling, amendments vis-a-vis feature (c) highlighted by the board):

- (g) "wherein respective data associated with the industrial automation system is filtered by a segmenter component (352) with regard to data that is to be provided to the modeler component (302) on the cloud platform and data that is not to be provided to the modeler component (302) on the cloud platform based on respective levels of data sensitivity of the data associated with the

industrial automation system, wherein the segmenter component (352) is associated with the mesh network component;".

IX. Claim 1 of the **fourth auxiliary request** differs from claim 1 of the third auxiliary request in that feature (g) is replaced by the following feature (board's labelling, amendments vis-a-vis feature (g) highlighted by the board):

(h) "wherein respective data associated with the industrial automation system is filtered by a segmenter component (352) with regard to data that is to be provided to the modeler component (302) on the cloud platform and data that is not to be provided to the modeler component (302) on the cloud platform based on one or more preferences, wherein the one or more preferences are determined or selected based on respective levels of data sensitivity of items of the data associated with the industrial automation system, wherein the segmenter component (352) is associated with the mesh network component;".

X. Claim 1 of the **fifth auxiliary request** differs from claim 1 of the main request in that feature (d) is replaced by the following feature (board's labelling, amendments vis-a-vis feature (d) highlighted by the board):

(i) "a collection component (308), comprised in the modeler component, configured to collect the set of industrial data and store the set of industrial data in a data store (318), wherein the collection component is employed by the modeler component;"

XI. Claim 1 of the **sixth auxiliary request** differs from claim 1 of the main request in that it further comprises (board's labelling)

- between features A) and (a), the following features:

(j) "a memory that stores computer-executable components;

(k) a processor operatively coupled to the memory, that executes the computer-executable components;"

- and, at the end, the following feature:

(l) ", wherein the computer-executable components comprise the modeler component and the collection component".

XII. Claim 1 of the **seventh auxiliary request** differs from claim 1 of the main request in that it further comprises, at the end, the following feature (board's labelling):

(m) "to facilitate remote interaction with the industrial automation system in response to an interaction with a virtualized industrial automation system generated based on the model".

XIII. Claim 1 of the **ninth auxiliary request** differs from claim 1 of the main request in that it further comprises, at the end, the following feature (board's labelling):

(n) ", wherein the model is a multi-dimensional model that facilitates presenting a multi-dimensional

view of the industrial automation system".

XIV. Claim 1 of the **tenth auxiliary request** differs from claim 1 of the third auxiliary request in that it further comprises, at the end of feature (g), the following features (board's labelling):

- (o) ", wherein the respective levels of data sensitivity are set for respective types of data associated with the industrial automation system;
- (p) wherein the segmenter component has a slider component to facilitate setting the respective level of data sensitivity".

XV. Claim 1 of the **eleventh auxiliary request** differs from claim 1 of the third auxiliary request in that features (a), (b) and (e) are replaced by the following features respectively (board's labelling, amendments vis-à-vis features (a), (b) and (e) highlighted by the board):

- (q) "a modeler component (302) on a cloud platform, wherein the modeler component comprises a model management component (304) configured to:

poll a set of devices (310, 312, 314, 316) of an industrial automation system (306) via respective cloud gateway components (330, 332, 334, 336) to facilitate obtaining a set of industrial data from the set of devices via respective information provider components (322, 324, 326, 328), and

generate an inventory of the set of devices of the industrial automation system;

- (r) a mesh network component (340) configured to obtain the a set of industrial data from the a set of devices (310, 312, 314, 316) of the an industrial automation system (306) and communicate the set of industrial data to the modeler component (302) on the cloud platform,
- (s) wherein the model management component of the modeler component is further configured to generate (1702) a model of the industrial automation system that corresponds to the industrial automation system, based on a result of an analysis of the set of industrial data and based on the inventory."

XVI. Claim 1 of the **twelfth auxiliary request** differs from claim 1 of the main request in that

- feature (a) is replaced by the following feature (board's labelling, amendments vis-à-vis feature (a) highlighted by the board):

(t) "a modeler component (302) on a cloud platform, wherein the modeler component comprises a model management component (304);"

and in that

- the following feature is added at the end (board's labelling):

(u) "wherein the model management component is configured to:

in response to a change in one portion of the industrial automation system, determine that operation of the industrial automation system

is deficient and can be improved, and determine a modification to be made to another portion of the industrial automation system to facilitate improving the operation of the industrial automation system; and wherein a recommendation to modify the another portion of the industrial automation system is presented and/or configuration information are sent to the another portion of the industrial automation system to facilitate said modification".

XVII. Claim 1 of the **thirteenth auxiliary request** differs from claim 1 of the main request in that, at the end, it further comprises the following feature (board's labelling):

(v) "wherein the modeler component (302) is configured to communicate configuration information of at least a portion of the model to another industrial automation system to facilitate configuration of at least a portion of the other industrial automation system based on the configuration information".

XVIII. Claim 1 of the **fourteenth auxiliary request** differs from claim 1 of the main request in that the following features are added at the end (board's labelling):

(w) ", wherein the modeler component (302) is configured to receive a set of legacy industrial device data from a communication device (320) that is configured to obtain the set of legacy industrial device data from a legacy industrial device that is not associated with a cloud gateway component (506_{1M}, 506_{NM}; 908; 1008),

(x) wherein the legacy industrial device is part of the industrial automation system (300),

- (y) wherein the legacy industrial device data comprises one or more visual images of the legacy industrial device captured by the communication device, or device information derived from the one or more visual images of the legacy industrial device captured by the communication device, and
- (z) wherein at least one of the modeler component or the communication device employ a recognizer technique or an optical character recognition technique to facilitate deriving at least a portion of the legacy industrial device data".

XIX. Claim 1 of the **fifteenth auxiliary request** differs from claim 1 of the eleventh auxiliary request in that it further comprises, at the end, features (w) to (z).

Reasons for the Decision

1. *Procedural matters*

1.1 Late notification of non-attendance

In this case, the respondent's representative provided his videoconferencing details eight days before the oral proceedings, indicating an intention to participate. However, he notified the board of his non-participation only **one day** before the scheduled proceedings (cf. point IV above). Typically, such notifications are given well in advance (see also **T 930/92**, Headnote I). Given that the board's preliminary opinion was issued ten months ahead of the scheduled hearing, the respondent had ample time to inform the board of its non-attendance well ahead of the hearing.

While it is not uncommon for representatives to receive late instructions, they should seek timely directions from their clients, particularly when arranged oral proceedings approach. In this instance, the representative failed to communicate promptly with the board's registry. Instead, the board received a brief written notice only one day before the arranged oral proceedings, without any further explanations. The board (and presumably the opposing party's representative) had already invested some time in preparing for the oral proceedings. According to Article 6 of the EPC Code of Conduct, members are required to act courteously in their dealings with the EPO. The same principle applies to behaviour towards other representatives (see Article 5(a) of the EPC Code of Conduct).

1.2 *Decision in written proceedings*

The respondent effectively withdrew its request for oral proceedings by declaring its intent not to attend them. In turn, the board did not consider the conduct of oral proceedings to be expedient (cf. Article 116(1) EPC). As a consequence, the decision is handed down in written proceedings (Article 12(8) RPBA).

2. *Technical background*

2.1 The opposed patent relates to the modelling of an industrial automation environment. It addresses the problem of providing an improved system for generating, on a "cloud platform", a model of an industrial automation system that corresponds to the real system based on data from its devices. The solution involves a "modeller component" that generates a model. According to the opposed patent, this model can be, for instance,

a multi-dimensional model, facilitating a multi-dimensional (e.g. "3D") view of the system. Moreover, this model can be used to interact with the real system, enabling remote viewing, remotely controlling the system's operations and remote troubleshooting.

2.2 Figure 1 (reproduced below) of the opposed patent shows a high-level overview of the system's architecture and its interaction with an industrial automation environment.

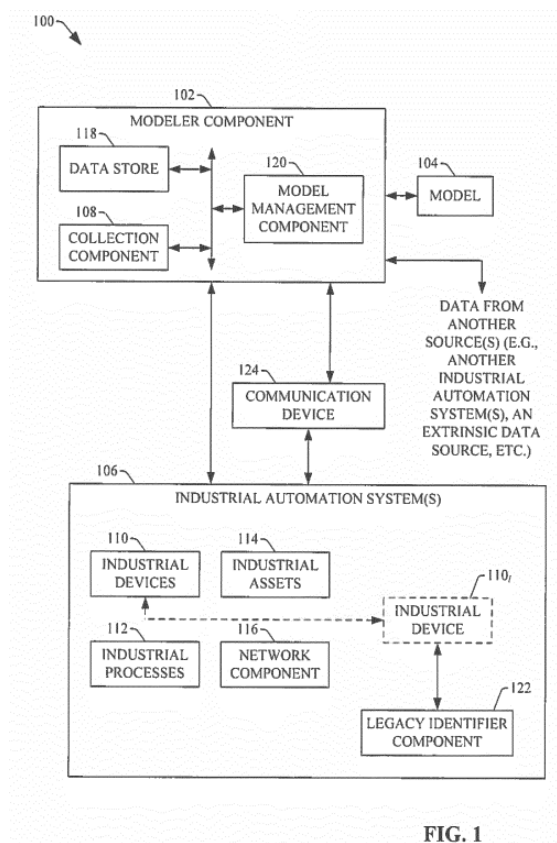


FIG. 1

In particular, Figure 1 illustrates industrial automation system 106 which represents the real-world system being modelled. Furthermore, industrial automation system 106 comprises various industrial devices 110 from which data is collected. This

collected data is stored in data store 118 and used by modeller component 102 to generate the model of the industrial automation system based on the collected data.

3. *Main request: claim 1 - construction*

3.1 In point 4.1 of the statement of grounds of appeal, the appellant re-iterated its arguments summarised in Reasons 3.1 of the appealed decision regarding claim construction. The board considers it to be expedient to focus in this respect on the terms

- "data" according to **features (b) and (c)** (see point 3.2 below)

and

- "model" in accordance with **feature (e)** (see point 3.3 below).

3.2 Reasons 3.2.2 of the appealed decision states that "*the term ['data'] is nowadays common general knowledge for communications and computing or computer assisted systems*". The board does not question this but notes that features (b) and (c) use the term "data" in several contexts (emphasis added):

- "a set of industrial data from a set of devices";
- "respective data [that] is filtered by a segmenter component";
- "data that is to be provided to the modeler component";
- "data that is not to be provided to the modeler component";

- "the data [that is] associated with the industrial automation system".

While the skilled reader may regard the first and fifth options above to relate, as a *first group*, to the same "data" and likewise for the second to fourth options above as a *second group*, they would readily understand these two groups not to necessarily concern the same "data": the fact that the filtering in accordance with feature (c) of the "data" of the *second group* is "based on respective levels of data sensitivity" of the "data" of the *first group* does not require the "data" of the two groups to be the same.

Moreover, as correctly pointed out by the appellant, the "segmenter component" of feature (c) is, contrary to what is disclosed in paragraph [00133] of the original application, not mandatorily part of the claimed system. It follows that the claimed system only needs to concern the "data" of the first and fifth options above, i.e. of the "set of industrial data" according to feature (b). Granted claim 1 merely poses the following two restrictions on this "set of industrial data":

- it must be storable in a data store in accordance with feature (d);
- it must be possible to associate "respective levels of data sensitivity" with this data, as set out in feature (c).

3.3 Reasons 3.2.1 of the appealed decision opines that "*the person skilled in the art does well know how the term ['modeling'] is to be understood*". Again, the board sees no reason to question this. In particular, the skilled reader would, based on their common general

knowledge, be aware of several model types that are frequently used in science and engineering, such as:

- 1) a visual model type, like a flow diagram for processes in a petrochemical plant;
- 2) a mathematical model type, like the general theory of relativity used in GPS-guided vehicles that interface with material-handling robots (cf. paragraph [0125] of the opposed patent);
- 3) a computational model type, e.g. to simulate $1/f$ noise in an electrical circuit with a computer system;
- 4) a physical model type, like a building's scale model made by a 3D-printing system
and
- 5) an operational model type, involving concrete, replicable procedures for representing a particular phenomenon in a physical system, such as to measure the mechanical hardness of a material produced by an industrial process or to optimally position a sonotrode in a "smart welder" (cf. paragraph [0124] of the opposed patent).

According to feature (e), the "modeler component" mentioned in feature (a) must generate "a model of the industrial automation system". Besides that, it must be generated based on the "set of industrial data" obtained by the mesh network component "from a set of devices of an industrial automation system" in accordance with feature (b), granted claim 1 specifies no details regarding this model. For instance, no details are specified regarding

- the model's input or output,

- the accuracy and technical relevance of outcomes, insights or predictions provided by the model and
- the circumstances under which the model is used.

Given this lack of details, the board holds that the "model of the industrial automation system" can be of any of the **model types 1) to 5)** mentioned above. As is apparent from the examples cited for these five model types above, each of these five model types can be readily applied in an "industrial automation system". Moreover, the "data" normally underlying these five model types can very well, depending on the circumstances, satisfy the two restrictions mentioned in the last paragraph of point 3.2 above. For instance, each of those five model types can in principle rely on digital data that are under copyright or another form of data protection. Furthermore, claim 1 as granted does not provide any details on the "result" or on the "analysis" of the set of industrial data in accordance with feature (e) either. This "analysis" could, for instance, merely relate to the amount of data that is provided, to the type of data (e.g. "video" or "audio") or to the integrity of the data. Accordingly, the "result" of this "analysis" could be a number, a type, a bit-error report or even a plain acknowledgement that the analysis was successful or inconclusive.

4. *Main request: claim 1 - sufficiency of disclosure*

4.1 Reasons 3.2.1 of the appealed decision suggests that the skilled person would in fact know how to generate the "model" in accordance with **feature (e)** based on paragraph [0013] of the opposed patent or even simply using their common general knowledge. The skilled person would allegedly know how to do so "*independently from the chosen structure/configuration of such*

'modeling' activity". However, the appellant disputes that paragraph [0013] of the opposed patent provides sufficient details in this respect.

4.2 The board notes that paragraphs [0103] to [0105] of the opposed patent state that a "simulation model" of an industrial automation system is generated based on "the set of data relating to the industrial automation system 206". It agrees in this regard with the appellant that the *"person skilled in the art is not able to identify, in the patent as a whole, which set of data is meant"* in **features (d) and (e)**. This is because, as further explained in points 4.2.1 to 4.2.5 below, the opposed patent provides only limited information on the "set of data" to be used to generate the "simulation model":

4.2.1 These paragraphs [0103] to [0105] at most disclose the "set of data" and the associated analysis to be such that the "properties, characteristics, functions, etc." of building blocks of industrial automation system 206 (e.g. blocks 210, 212, 214 and 216 shown in Figure 2 of the opposed patent) or their "interrelationships" can be simulated or emulated.

4.2.2 Paragraph [0064] of the opposed patent suggests that the "data" can relate, for instance, to the type or version of the software utilised by the industrial automation system. However, it does not set out how this kind of data is actually used to generate the "model" according to feature (e).

4.2.3 Paragraphs [0075] and [0076] of the opposed patent describe a scenario where "modeler component 202" analyses "the data" and updates model 204 to reflect or represent a "motor short" that may cause a "fluid

spill" in industrial automation system 206. Updated model 204 can then be used by a virtualisation component 224 to update virtualised industrial automation system 226 and present a graphical representation illustrating the motor short and fluid spill. Paragraph [0013] of the opposed patent refers in this respect also to "relationships" between "constituent components" of the industrial automation system and "a multi-dimensional view (e.g. 3-D view or 2-D view) of the industrial automation system" (emphasis added).

4.2.4 Moreover, paragraph [0081] of the opposed patent seems to suggest that the "data" can relate to the role that certain "users" can assume with respect to the industrial automation system, such as a "maintenance engineer", a "shift supervisor" or a "network engineer". It is, however, not explained how these user roles take part in generating the "model" in accordance with feature (e).

4.2.5 Likewise, paragraph [0176] of the opposed patent mentions "extrinsic data" such as data relating to "energy cost", "material cost" or "web site traffic statistics". Yet, it is also not explained how this data contributes to generating the "model" in accordance with feature (e).

4.2.6 Therefore, the board considers that the opposed patent at most concerns a "simulation model" that can be used to make a (multi-dimensional) graphical representation.

4.3 This in turn means that, of the five model types mentioned in point 3.3 above, the opposed patent concerns only **model type 3)** and to some extent also **model type 1)**. How the "modeler component" of

feature (e) could generate a "model" of, for instance, **model types 2) and 5)** is however not disclosed in the opposed patent. This would, contrary to what was found in Reasons 3.2.1 of the appealed decision (cf. point 4.1 above), also not be apparent based solely on a skilled person's common general knowledge, given that model types 2) and 5) would, at least in general, require extensive research, knowledge and expertise. The "big data" analysis mentioned in, for instance, paragraphs [0020], [0029] and [0129] of the opposed patent may provide some assistance in this respect, but, in the board's view, it will typically require a highly-trained specialist to manage the relevant data. Moreover, myriads of platforms are available for analysing "big data", typically offering a different trade-off between accuracy, usefulness and cost. Which one to take for generating the "model" in accordance with feature (e) will depend, for instance, on the model's intended purpose, e.g. predicting a system's behaviour, developing a new system or optimising an existing one. The opposed patent only provides vague statements in this respect, such as

- *"provide an improved system"* in paragraph [0009],
- *"facilitate interacting with (e.g., remotely monitoring operation of, tracking operation of, controlling operation of, troubleshooting problems with, providing assistance relating to, etc., via a communication device) the industrial automation system"* in paragraph [0029],
- *"simulating or emulating the properties, characteristics, functions, etc., of the respective devices, processes, and/or assets of the industrial automation system"* in paragraph [0103]

and

- "cloud platform 502 [hosting the modeler component as per **feature (a)**] can be any infrastructure that can allow cloud services" (emphasis added) in paragraph [0127].

4.4 Moreover, even when confining the model types to merely **model types 1) and 3)**, the invention defined by granted claim 1 is not sufficiently disclosed by the opposed patent, at least not for all technically meaningful interpretations which would objectively occur to the skilled reader based on their common general knowledge (cf. **T 149/21**, Reasons 3.6). This is because it would not be apparent for the skilled person, neither based on their common general knowledge nor based on the teaching of the opposed patent, how to actually carry out the invention defined by claim 1 for the examples mentioned in the last paragraph of point 3.3 above, i.e. for those sets of industrial data, analyses of these sets and results of these analyses that are not restricted to "properties, characteristics, functions, etc." of selected building blocks of the industrial automation system or their "interrelationships" (cf. point 4.2.1 above).

4.5 Hence, contrary to the opposition division's conclusion drawn in Reasons 3 of the appealed decision, the opposed patent does not disclose the invention defined in claim 1 of the main request in a manner sufficiently clear and complete for it to be carried out by the skilled person. As a consequence, the ground for opposition under Article 100(b) EPC prejudices the maintenance of the patent as granted.

5. *Auxiliary requests: claim 1 - sufficiency of disclosure*

- 5.1 The appealed decision was not, within the meaning of Article 12(2) RPBA, "based on" the **fifteen auxiliary requests** mentioned in point 3 above since the opposition division rejected the opposition. In such a case, the proprietor has to demonstrate that these requests were "admissibly filed and maintained" in the proceedings before the opposition division (cf. Article 12(4), first sentence, RPBA). If this is done, the auxiliary requests form part of the appeal proceedings.
- 5.2 In the case in hand, the board notes that, irrespective of this admittance issue, the invention as defined in claim 1 of any of these fifteen auxiliary requests is not sufficiently disclosed either. This is because none of **features (f) to (z)** provides a remedy for at least the deficiency mentioned in point 4.4 above. In particular, the "model management component" and "inventory" mentioned in **features (q) and (s)** do not concern *how* to generate a "model" in accordance with feature (e) based on any of the "sets of industrial data", the *analyses* of these sets and the *results* of these analyses set out in the last paragraph of point 3.3 above. Likewise, the "set of legacy industrial device data" as per **feature (w)** can still be analysed merely in relation to the amount, the type or the integrity of the data, as explained in the last paragraph of point 3.3 above.
- 5.3 Hence, the fifteen auxiliary requests are not allowable under Article 83 EPC either.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chair:



B. Brückner

K. Bengi-Akyürek

Decision electronically authenticated