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Datasheet for the decision
of 9 July 2021

Case Number:	T 1635/19 - 3.5.07
Application Number:	11764434.4
Publication Number:	2622483
IPC:	G06F11/30, G06Q10/08, G06Q50/00, B61L27/00
Language of the proceedings:	EN

Title of invention:
Adaptive remote maintenance of rolling stocks

Applicant:
Siemens Mobility GmbH

Headword:
Rolling-stock maintenance/SIEMENS MOBILITY

Relevant legal provisions:
EPC Art. 56, 123(2)
RPBA 2020 Art. 11

Keyword:
Remittal to the department of first instance - (no)
Added subject-matter - main request (yes)
Inventive step - first auxiliary request (no)

Decisions cited:
T 0154/04, T 0655/13

Beschwerdekammern

Boards of Appeal

Chambres de recours

D E C I S I O N
of Technical Board of Appeal 3.5.07
of 9 July 2021

Appellant:	Siemens Mobility GmbH
(Applicant)	Otto-Hahn-Ring 6
	81739 München (DE)
Representative:	Deffner, Rolf
	Siemens Mobility GmbH
	Postfach 22 16 34
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Decision under appeal:	Decision of the Examining Division of the European Patent Office posted on 14 January 2019 refusing European patent application No. 11764434.4 pursuant to Article 97(2) EPC

Composition of the Board:

Chairman	J. Geschwind
Members:	R. de Man
	P. San-Bento Furtado

Summary of Facts and Submissions

I.   The appellant (applicant) appealed against the decision
        of the examining division refusing European patent
        application No. 11764434.4, which was published as
        international application WO 2012/047529.

II.   The examining division decided that the subject-matter
        of all claims 1 to 20 of the sole request lacked
        inventive step in view of a combination of documents D5
        and D1, which were identified in earlier communications
        as follows:

        D1: US 2002/0144551 A1, 10 October 2002;
        D5: US 2004/0243636 A1, 2 December 2004.

        It also decided that the claims were not clear within
        the meaning of Article 84 EPC due to an inconsistency
        between the claims and the description.

III.   In its statement of grounds of appeal, the appellant
        maintained the sole request on which the examining
        division had based its decision and requested that the
        decision under appeal be set aside.

        Since "the matter of the independent claims" had not
        been fully considered, the appellant requested that the
        case be remitted to the examining division for further
        prosecution. Alternatively, it requested a decision on
        the patentability of the application.

IV.   In a communication accompanying the summons to oral
        proceedings, the board raised objections under
        Articles 84 and 123(2) EPC and expressed the view that

the subject-matter of claim 1 lacked inventive step over document D5.

V.   In a letter dated 8 June 2021, the appellant maintained the request on which the examining division had based its decision as the main request and filed a first auxiliary request.

VI.   In a subsequent letter dated 9 June 2021, the appellant requested that the decision under be appeal be set aside and that the case be remitted to the examining division for further prosecution on the basis of the main request or on the basis of the first auxiliary request or, alternatively, that a patent be granted on the basis of the claims of the main request or of the first auxiliary request.

        It submitted that the contested decision did not comply with Rule 111(2) EPC because the examining division had failed to adequately consider the technical character, technical contribution and inventive character of each feature of each of the claims. This constituted a fundamental deficiency within the meaning of Article 11 RPBA 2007, requiring the board to remit the case to the department of first instance.

VII.   Oral proceedings were held on 9 July 2021. At the end of the oral proceedings, the Chair announced the board's decision.

VIII.   The appellant's final requests were that the decision under appeal be set aside and that the case be remitted to the department of first instance for further prosecution or, alternatively, that a patent be granted on the basis of the claims of the main request or of the first auxiliary request.

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

"A method implemented on a processing system (100) for
adaptive remote maintenance of a rolling stock, the
method comprising:
          receiving (22), by a processor (102) diagnostic
information which includes sensor data from subsystems
of the rolling stock
          identifying (24), by the processor (102), a
plurality of events based on a plurality of current
rules applied to the sensor data, the current rules and
corresponding events being for maintenance incidents of
the rolling stock;
          receiving (26) from a memory dispensation
information showing dispensation of the events relative
to the respective current rules, the dispensation
corresponding to event validation and event discarding;
          applying (28), by the processor (102), supervised
learning to the sensor data with the event validation
and event discard as ground truth information; and
          outputting (30) a new rule from the applying (28)
of the supervised learning, the new rule being
different than any of the current rules; applying the
new rule; and,
          issuing repair and maintenance orders for the
rolling stock."

X.   Claim 1 of the first auxiliary request reads as
          follows:

"A method implemented on a processing system (100) for
adaptive remote maintenance of a rolling stock, the
method comprising:
          receiving (22), by a processor (102) diagnostic
information which includes messages, sensor data, or

messages and sensor data from subsystems of the rolling stock

identifying (24), by the processor (102), a plurality of events based on a plurality of current rules applied to the diagnostic information, the current rules and corresponding events being for maintenance incidents of the rolling stock;

receiving (26) information corresponding to event validation and event discarding of the events relative to the respective current rules;

applying (28), by the processor (102), supervised learning to the diagnostic information with the event validation and event discard as ground truth information;

outputting (30) a new rule from the applying (28) of the supervised learning, the new rule being different than any of the current rules; and

applying the new rule."

XI.   The appellant's arguments, where relevant to the decision, are discussed in detail below.

Reasons for the Decision

1.   The application relates to adaptive remote maintenance of rolling stock with the help of machine learning.

2.   *The request for remittal to the department of first instance for further prosecution*

2.1   In its statement of grounds of appeal, the appellant requested remittal of the case to the examining division for further prosecution because "the matter of the independent claims" had not been fully considered.

In its letter of 9 June 2021, the appellant argued for the first time that the contested decision was not reasoned within the meaning of Rule 111(2) EPC, which constituted a fundamental deficiency within the meaning of Article 11 RPBA 2007, requiring the board to remit the case to the examining division. The appellant referred to decision T 655/13, which set out the requirement that the board had to be able to examine the reasons for the impugned decision.

2.2   According to Article 11 RPBA 2020, which in view of Article 25 RPBA 2020 is applicable here, a case is not to be remitted to the examining division for further prosecution unless special reasons present themselves for doing so. As a rule, a fundamental deficiency which is apparent in the proceedings before the examining division constitutes such a special reason.

        Hence, even if a fundamental deficiency were apparent, the board would still have discretion not to remit the case to the examining division but to deal with the substance of the case itself.

2.3   In the present case, there is no indication that the alleged fundamental deficiency hindered the appellant in preparing its appeal. Indeed, the appellant argued that the contested decision was not reasoned within the meaning of Rule 111(2) EPC only in response to the board's summons to oral proceedings. Nor did the alleged fundamental deficiency prevent the board from carrying out a preliminary examination of the case; the board was in fact able to examine the reasons for the impugned decision.

        In view of these circumstances alone, the board considers it appropriate to reject the appellant's

request for remittal of the case to the examining
division for further prosecution and to continue with
the examination of the merits of the case. It can
therefore be left open whether the contested decision
was indeed insufficiently reasoned or merely failed to
convince the appellant.

Main request

3.   *Added subject-matter – Article 123(2) EPC*

3.1   Claim 1 is directed to "a method implemented on a
         processing system", i.e. to a computer-implemented
         method. The method includes the step "issuing repair
         and maintenance orders for the rolling stock", which
         was not present in original claim 1. According to the
         letter of 19 November 2014 filed with the examining
         division, this amendment was based on paragraphs [0004]
         and [0073] of the published application.

3.2   Paragraph [0004] mentions repair and maintenance
         orders. However, this paragraph is part of the
         background section of the application and describes
         prior-art methods in which persons referred to as
         "fleet dispatchers" manually filter out and group
         together various messages and sensor data. This passage
         therefore does not disclose a computer-implemented step
         of "issuing repair and maintenance orders".

         Paragraph [0073] does not mention repair and
         maintenance orders. It does state that "the processor
         102 applies the resulting (machine-learned) statistical
         model or rules to the received data" and that
         "[a]lternatively, rules are applied by dispatchers".
         Even if this is understood as a reference to the "fleet
         dispatchers" of paragraph [0004], it does not disclose

that repair and maintenance orders are issued by a
processor or a processing system.

The board is not aware of any other passage in the
application as filed that could serve as a basis for
the amendment.

3.3   In its reply to the board's communication, the
       appellant did not comment on the board's objection to
       the feature "issuing repair and maintenance stock". In
       the oral proceedings before the board, the appellant
       confirmed that it relied on its written submissions in
       respect of compliance of the main request with
       Article 123(2) EPC.

3.4   The board therefore concludes that the subject-matter
       of claim 1 of the main request extends beyond the
       content of the application as filed, contrary to
       Article 123(2) EPC.

First auxiliary request

4.   The first auxiliary request represents a reasonable
       reaction to objections raised for the first time in the
       board's communication and was filed at the earliest
       opportunity. It is therefore admitted into the appeal
       proceedings under Article 13(2) RPBA 2020.

5.   *The invention as defined by claim 1*

5.1   Claim 1 is directed to a computer-implemented method
       ("implemented on a processing system") for adaptive
       remote maintenance of rolling stock. Examples of
       rolling stock are trains and trucks (see paragraph
       [0002] of the published application).

5.2   A processor receives diagnostic information from
       subsystems of rolling stock and identifies a plurality
       of events relating to maintenance incidents of rolling
       stock by applying "current rules" to the diagnostic
       information. The diagnostic information includes
       messages, sensor data, or messages and sensor data.

5.3   The processor further receives information
       "corresponding to event validation and event discarding
       of the events relative to the respective current
       rules".

       The board notes that this information may have been
       generated by a human operator who evaluates the
       identified events and discards those which are not
       relevant (paragraphs [0031] and [0032]).

5.4   The processor generates a new rule different from the
       current rules by applying supervised learning to the
       diagnostic information with the information
       corresponding to event validation and event discarding
       as ground truth information.

5.5   The new rule is output and applied.

6.   *Inventive step*

6.1   Document D5 relates to a computer-implemented system
       and method for monitoring the health of a fleet of
       assets such as aircraft, ground-based vehicles and
       locomotives and for remotely maintaining the fleet
       (paragraphs [0001] and [0014]). The health of an asset
       is monitored by instrumenting the asset with sensors
       and monitoring sensor readings to detect signs of
       failure (paragraph [0002]).

Monitoring sensor readings involves comparing sensor
values related to an asset with parameters that are
estimated on the basis of a model of the asset
(paragraph [0015]). The model is initially generated on
the basis of historical data (ibid.). The parameters of
the model are re-determined on the fly on the basis of
current observations of data values (paragraph [0017]).
Alerts are generated when sensor values deviate from
estimated values by more than a threshold value
(paragraphs [0037] and [0038]).

The sensor values and alerts, i.e. diagnostic
information within the meaning of claim 1, are provided
to an "incident diagnostics engine", which applies
rules to the diagnostic information to generate a
plurality of events referred to as "incidents"
(paragraph [0039]). These incidents are added to a
watch list (ibid.).

Incidents on the watch list are presented by means of a
graphical user interface (paragraph [0158]), thereby
allowing human experts to take appropriate actions
(paragraph [0013], last sentence, and paragraph [0014];
paragraph [0007]).

6.2   Hence, the method of claim 1 differs from the
       disclosure of document D5 in that it comprises:

       (a) receiving "information corresponding to event
           validation and event discarding of the events
           relative to the respective current rules";
       (b) applying supervised learning to the diagnostic
           information with the "event validation and event
           discard" as ground truth information;

(c) outputting a new rule from the applying of the
    supervised learning, the new rule being different
    than any of the current rules;
(d) applying the new rule.

In addition, claim 1 specifies that the diagnostic
information is received from subsystems of rolling
stock (distinguishing feature (e)).

6.3   The distinguishing feature (e) is obvious given that
       assets of rolling stock typically comprise subsystems
       having their own sensors (see published application,
       paragraph [0003]; D5, paragraph [0003]).

6.4   The distinguishing features (a) to (c) express that a
       new rule for the identification of events/incidents
       from diagnostic information is created by applying
       supervised learning to the diagnostic information while
       using the information indicating which of the generated
       events/incidents have been validated and which have
       been discarded by human experts as ground truth
       information. Feature (d) then expresses that the newly
       generated rule is applied (to future diagnostic
       information).

6.5   The distinguishing features (a) to (d) relate to an
       abstract scheme of learning a new classification rule
       (for classifying certain combinations of sensor values
       as events/incidents) on the basis of input data (the
       diagnostic information) and expected output data (the
       "ground truth information" indicating whether the
       events generated by the current rules are correct (by
       having been validated) or not (by having been
       discarded)). This abstract scheme is non-technical "as
       such". This means that the scheme is to be taken into
       account when assessing inventive step only to the

extent that it interacts with the technical subject-
matter of the claim to solve a technical problem
(T 154/04, OJ EPO 2008, 46, Reasons 5, under (F)).

6.6   The appellant argued that, since the claim included
        features specifying that the steps of the method were
        implemented on a processing system and performed "by a
        processor", all the non-technical features of the claim
        contributed to solving a technical problem.

        However, the use of technical means to carry out a non-
        technical feature does not mean that the non-technical
        feature interacts with the technical means to solve a
        technical problem. Rather, the technical means are used
        to solve the problem of implementing the non-technical
        feature. Since in the case at hand the technical means
        consist in a processing system and a processor, both
        being well-known and used for their normal purpose, no
        inventive contribution can be seen in the
        implementation of the non-technical abstract scheme.

6.7   The appellant also argued that all claim features had
        to be assessed individually when assessing their
        technical contribution and that "lumping them
        together", as both the examining division and the board
        had done, was incorrect.

        However, beyond the trivial and thus obvious aspect of
        their implementation on a computer, the board cannot
        see how any of the individual features of claim 1, when
        considered in isolation, could make a technical
        contribution. It is therefore the combination of the
        claimed features that requires further consideration.

6.8   The appellant further argued that the rules were used
        to filter diagnostic information including sensor data.

By improving the rules by means of a learning routine, rolling stock issues could be identified with better accuracy. As those issues were measured by sensors, they were of a technical nature. More accurate rules therefore contributed to solving a technical problem.

However, the quality of the new rule in terms of its effect on the accuracy of the identified events fully depends on the quality of the ground truth information. The origin of this information is not specified in the claim, and the description confirms that it may be the result of cognitive processing by a human operator dealing with the events. Any improvement in the quality of the event identification therefore is not a technical effect achieved by the features of the claim. In addition, the accuracy of the identified events is not a technical parameter, since it is judged by the human operator.

6.9   In view of the above, the board judges that the distinguishing features (a) to (d) do not provide a technical contribution going beyond their straightforward and thus obvious implementation using well-known technical means.

6.10   Hence, the subject-matter of claim 1 of the first auxiliary request lacks inventive step (Article 56 EPC).

Conclusion

7.   Since none of the appellant's requests is allowable, the appeal is to be dismissed.

Order

For these reasons it is decided that:

1.   The request for remittal of the case to the department
        of first instance for further prosecution is rejected.

2.   The appeal is dismissed.

The Registrar: The Chairman:

B. Brückner   J. Geschwind

Decision electronically authenticated