

Internal distribution code:

- (A) [-] Publication in OJ
- (B) [-] To Chairmen and Members
- (C) [-] To Chairmen
- (D) [X] No distribution

**Datasheet for the decision
of 13 July 2016**

Case Number: T 2049/11 - 3.4.03

Application Number: 06763141.6

Publication Number: 1891604

IPC: G07C3/08

Language of the proceedings: EN

Title of invention:

A SYSTEM FOR MEASURING THE PERFORMANCE OF A FOREST MACHINE

Applicant:

John Deere Forestry OY

Headword:

Relevant legal provisions:

EPC 1973 Art. 56

Keyword:

Inventive step - (yes)

Decisions cited:

T 0177/01, T 0799/02

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 2049/11 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 13 July 2016

Appellant: John Deere Forestry OY
(Applicant) Lokomonkatu 21
FI-33900 Tampere (FI)

Representative: Tampereen Patenttitoimisto Oy
Visiokatu 1
33720 Tampere (FI)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted on 5 May 2011 refusing European patent application No. 06763141.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman G. Eliasson
Members: T. M. Häusser
T. Bokor

Summary of Facts and Submissions

- I. The appeal concerns the decision of the examining division refusing the European patent application No. 06763141 for lack of inventive step (Article 56 EPC 1973).
- II. Reference is made to the following documents:
- D1: US 2004/0250908 A1,
D2: US 2002/0099520 A1.
- III. The appellant (applicant) requested to set aside the decision and to grant a patent in the following version:
- claim pages 32, 35, and 36 (containing claims 1-2, parts of claims 3 and 13 and claims 14-20) as filed with the letter dated 30 June 2016 and claim pages 33 and 34 (containing parts of claims 3 and 13 and claims 4-12) as filed with the letter dated 13 April 2016,
 - description pages 1-3, 5, and 10-31 as filed with the letter dated 13 April 2016 and description pages 4 and 6-9 as filed with the letter dated 29 June 2016,
 - drawing sheets 1/8 to 8/8 as published.
- IV. The wording of independent claims 1 and 13 is as follows (board's labelling "(a)", "(b)", "(c)", and "(d)"):
- "1. A method for monitoring the performance of a subsystem or function of a forest machine, comprising the steps of:
- performing processing of several tree trunks by a harvester head connected to the forest machine;

during the processing of each trunk, taking measurements to find out a trunk size class specific to the trunk being processed;

collecting, during the processing of said trunk, measurement data associated with said trunk and relating to the function of a subsystem or the performing of a function:

continually collecting said measurement data for several trunks during the processing of said several trunks;

characterized in that the method further comprises the steps of:

- (a) making a division of said collected measurement data into several trunk size classes to compensate for processing conditions, wherein the division is based on the trunk size class of the trunk said collected measurement data is associated with, and wherein the trunk size class is based on a diameter of the trunk, or a volume of the trunk, or a remaining volume of the trunk;
- (b) computing at least one characteristic value for said several trunks, wherein the computation takes place on the basis of the measurement data divided into the trunk size classes, to describe the performance of said subsystem or function;
- (c) repeatedly computing the characteristic value; and
- (d) storing the time history of the computed characteristic value in the form of a performance history of the forest machine, by means of which the variation in time of the computed characteristic value and thereby the performance of the subsystem or function can be monitored."

"13. A system for monitoring the performance of a subsystem or a function of a forest machine, comprising

a control system which is arranged:

to control a subsystem or a function;

to control processing of several trunks by a harvester head connected to the forest machine;

during the processing of each trunk, to take measurements to find out a trunk size class specific to the trunk being processed;

to collect, during the processing of said trunk, measurement data associated with said trunk and relating to the function of said subsystem or the performing of said function;

to continually collect said measurement data for several trunks during the processing of said several trunks;

characterized in that the control system is further arranged:

to make a division of said collected measurement data into several trunk size classes to compensate for processing conditions, wherein the division is based on the trunk size class of the trunk said collected measurement data is associated with, and wherein the trunk size class is based on a diameter of the trunk, or a volume of the trunk, or a remaining volume of the trunk;

to compute at least one characteristic value for said several trunks, wherein the computation takes place on the basis of the measurement data divided into the trunk size classes, to describe the performance of said subsystem or function;

to repeatedly compute the characteristic value; and

to store the time history of the computed characteristic value in the form of a performance history of the forest machine, by means of which the variation in time of the computed characteristic value and thereby the performance of the subsystem or function can be monitored."

- V. The appellant argued essentially as follows in relation to inventive step:

Document D1 represented the closest state of the art and did not disclose the characterizing features of claim 1. These features related to the objective technical problem of making it possible to compare independently of variable factors and reliably old measurement data with new measurement data relating to carrying out a function of a forest machine, measured under varying operating conditions of the forest machine. Document D2 disclosed no specific instructions how to solve the objective technical problem, but merely disclosed a system to collect, transmit and display information related to the status of a machine or a plurality of machines.

Reasons for the Decision

2. Amendments

Claims 1 and 13 are based on claims 1, 5, and 20 as originally filed and on the description as originally filed (paragraphs bridging pages 2-3 and pages 4-5; page 11, last paragraph; page 13, third paragraph; page 20, third paragraph - page 22, first paragraph).

Dependent claims 2-12 and 14-19 are based on original claims 2-4, 7, 8, 10-14, 21-24, and 27 and on the description as originally filed (paragraphs bridging pages 20-21 and pages 21-22; page 21, paragraphs 4 and 6; page 24, paragraph 2; page 25, last paragraph). The description has been brought into conformity with the amended claims and supplemented with an indication of

the relevant content of the prior art without extending beyond the content of the application as filed.

Accordingly, the board is satisfied that the amendments comply with the requirements of Article 123(2) EPC.

3. Inventive step

3.1 Closest state of the art

In its assessment of inventive step the examining division started from document D1 as the closest state of the art (see point 9 of the decision under appeal). The appellant also considers D1 as the closest prior art. Indeed, document D1 discloses subject-matter that is conceived for the same purpose as the claimed invention, namely for monitoring the performance of a subsystem or function of a forest machine, and has the most relevant technical features in common with it, as detailed below. Document D1 is therefore regarded as the closest state of the art.

3.2 Distinguishing features

3.2.1 Document D1 discloses (see paragraphs [0012]-[0020], [0025]-[0031], [0036], and [0070]) a method and an apparatus of managing a tree harvesting process. During a tree cutting phase 104 the trees are cut using a feller buncher, which is followed by tree processing involving, for example, the delimiting of the trees and the cutting of the trees into portions. In a tree relocation phase 106, the cut trees are relocated from the region where they were cut to a second region. The harvesting is monitored using mobile communicators 206 associated with the harvesting equipment 204 and communicating with a remote data facility 208. In par-

ticular, the position, time and operation of the machine 204 may be monitored using automatically sensed machine operations. Moreover, productivity characteristics and equipment maintenance issues, such as service hours of the equipment, may be monitored. Furthermore, during the tree cutting phase a plurality of characteristics may be determined, such as the diameter, species, density, and moisture content of the trees. For example, the feller buncher may determine the tree diameter using diameter sensing devices.

3.2.2 The board agrees with the examining division's assessment regarding the issue of which claimed features are disclosed in document D1. In point of fact, using the wording of claim 1, this document discloses a method for monitoring the performance of a subsystem or function of a forest machine (monitoring of productivity characteristics and maintenance issues), comprising the steps of:

performing processing of several tree trunks by a harvester head (feller buncher) connected to the forest machine (harvesting equipment 204);

during the processing of each trunk, taking measurements to find out a trunk size class specific to the trunk being processed (determination of the tree diameter by the feller buncher);

collecting, during the processing of said trunk, measurement data associated with said trunk (concerning the tree diameter) and relating to the function of a subsystem or the performing of a function (concerning the productivity characteristics and maintenance issues);

continually collecting said measurement data for several trunks during the processing of said several trunks (in order to monitor the process);

The subject-matter of claim 1 differs from the method of document D1 in comprising the characterizing steps (a), (b), (c), and (d) (see point IV. above for the wording).

3.3 Objective technical problem

3.3.1 The examining division held that two independent problems were solved by features (a), (b), and (c) on the one hand and feature (d) on the other hand. The first problem related to features (a), (b), and (c) was "the trade-off between enough data to be considered in order to have a pertinent statistic and dividing the data in several categories relating to different external conditions". Feature (d) was merely considered as a "usual feature for the skilled person in the field of data acquisition and analysis" (see point 9.3 of the decision).

3.3.2 The board considers that in relation to features (a), (b), and (c) the examining division did not formulate a problem to be solved but merely stated a consideration that the skilled person might have when attempting to solve the technical problem.

Moreover, this statement concerns the division of data into several categories relating to different external conditions which is considered as a pointer to the claimed "division of said collected measurement data into several trunk size classes to compensate for processing conditions" of feature (a) and therefore also to the repeated computation of the characteristic value of features (b) and (c), which is based on this division of the measurement data.

However, it is the established jurisprudence of the Boards of Appeal that the technical problem addressed by the invention must be formulated in such a manner that there are no pointers to the solution (see T 0799/02, Reason 4.3; T 0177/01, Reason 4.3). Otherwise the assessment of inventive step would be tainted by *ex post facto* considerations and could not be regarded as having an objective basis.

3.3.3 Features (a), (b) and (c) are all related to the computation of the characteristic value, as can be seen from the discussion under point 3.3.2 above. Feature (d) relates to the storage of the characteristic value in the form of a performance history of the forest machine. All of these features are therefore *functionally interdependent* and it is not appropriate to formulate partial problems in relation to them (see Case Law of the Boards of Appeal of the EPO, 7th edition 2013, section I.D.9.2.2). Rather, one single objective technical problem should be formulated in view of the common technical effect of these features.

3.3.4 In fact, by means of the trunk size the measured data are normalized. The effect of features (a), (b), (c) and (d) is therefore to allow more reliable and accurate monitoring of the performance of the subsystem or function of the forest machine (see pages 3 and 4 of the description of the application).

The objective technical problem of the invention is therefore to render the monitoring of the performance of the subsystem or function of the forest machine more accurate and reliable.

3.4 Obviousness

- 3.4.1 The examining division held in the appealed decision that document D2 described a way of dividing and processing data in a manner identical to that of features (a), (b) and (c) (see point 9.3 of the decision).
- 3.4.2 Document D2 relates to (see paragraphs [0050]-[0062] and claims 1 to 11) displaying information related to the status of a plurality of machines 102A, 102B, 102C. A data module 104 is coupled to each of the plurality of machines 102A, 102B, 102C and is adapted to collect and store information related to the corresponding machine. A data link 106 is adapted to transmit data and information between the machines 102A, 102B, 102C and a display module 108. The display module 108 is adapted to display information relayed from only a subset of the plurality of machines 102A, 102B, 102C, which is selected from the plurality of machines 102A, 102B, 102C as a function of machine parameters input by a user 110. The information relayed from the machines relates, for example, to service meter update, machine location, diagnostic information or status information. The information may be used, for example, by a fleet manager to schedule and review work schedules. Additionally, a service center may use the information to review the status, schedule maintenance and diagnose problems related to a plurality of vehicles (see paragraph [0008]).

Hence, the board considers that document D2 does not provide any indication on how to improve the *performance* monitoring of a machine, i. e. on how to monitor the performance of the machine in a more accurate and reliable manner. Rather, that document is essentially concerned with efficiently scheduling machines and maintaining their proper functioning.

Moreover, document D2 discloses (see, in particular, paragraphs [0054] and [0055]) that the machines could be computer systems, automobiles, engines, generators, work machines or any other types of machines. In a specific example it is disclosed that the machines are work machines 302A, 302B situated at a worksite 304, e. g. a mine site.

The board notes that there is no disclosure in document D2 that the disclosed machines might be related to logging trees or processing tree trunks. There is thus no suggestion in that document to perform the division of collected measurements into classes which are specific to such machines, namely into trunk size classes.

In view of the above, document D2 is not considered to contain any information which would lead the skilled person to the claimed invention.

- 3.4.3 In document D1 several tree characteristics, such as diameter, species, density, moisture content, weight, and length are measured in order to monitor the tree harvesting process, so that inefficient operations can be avoided and real time environmental compliance data can be provided (see paragraphs [0002] and [0003]). There is, however, no indication in document D1 to use these tree characteristics in order to determine the performance of a machine. In particular, there is no suggestion to perform the division of collected measurements into trunk size classes and to evaluate the performance on the basis of such a division.

Moreover, the tree characteristics and the performance of the forest machine are *a priori* separate issues of

the harvesting process. In the board's judgment it would therefore not be obvious for the skilled person, a tree harvesting expert, to combine these issues in order to solve the posed problem of rendering the monitoring of the performance of the subsystem or function of the forest machine more accurate and reliable.

- 3.4.4 The other documents mentioned in the search report do not contain any disclosure that would lead the skilled person to the claimed subject-matter, either.

Therefore, the subject-matter of claim 1 involves an inventive step. Independent system claim 13 corresponds essentially to method claim 1. Claims 2 to 12 and 14 to 20 are dependent on claims 1 and 13, respectively.

Accordingly, the subject-matter of claims 1 to 20 involves an inventive step (Article 52(1) EPC and Article 56 EPC 1973).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to grant a patent in the following version:
 - claims: pages 32, 35, and 36 as filed with the letter dated 30 June 2016 and pages 33 and 34 as filed with the letter dated 13 April 2016,
 - description: pages 1-3, 5, and 10-31 as filed with the letter dated 13 April 2016 and pages 4 and 6-9 as filed with the letter dated 29 June 2016,
 - drawing sheets 1/8 to 8/8 as published.

The Registrar:

The Chairman:



S. Sánchez Chiquero

G. Eliasson

Decision electronically authenticated