

Internal distribution code:

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

**Datasheet for the decision
of 17 September 2021**

Case Number: T 1371/16 - 3.5.07

Application Number: 03257060.8

Publication Number: 1418513

IPC: G06F17/50

Language of the proceedings: EN

Title of invention:

CAD apparatus, method, program and medium storing the program,
for designing a wiring path

Applicant:

YAZAKI CORPORATION

Headword:

Designing a wiring path/YAZAKI

Relevant legal provisions:

EPC Art. 56, 84

Keyword:

Inventive step - main request (no) - mixture of technical and
non-technical features

Claims - clarity - auxiliary request (no)

Decisions cited:

G 0001/19



Beschwerdekammern
Boards of Appeal
Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1371/16 - 3.5.07

D E C I S I O N
of Technical Board of Appeal 3.5.07
of 17 September 2021

Appellant: YAZAKI CORPORATION
(Applicant) 4-28, Mita 1-chome
Minato-ku
Tokyo 108-8333 (JP)

Representative: Gill Jennings & Every LLP
The Broadgate Tower
20 Primrose Street
London EC2A 2ES (GB)

Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 4 March 2016
refusing European patent application
No. 03257060.8 pursuant to Article 97(2) EPC**

Composition of the Board:

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

Summary of Facts and Submissions

- I. The appeal lies from the decision of the examining division to refuse European patent application No. 03257060.8.

The examining division decided that the subject-matter of claim 1 of the sole request lacked inventive step over the following document:

D1: T. Alibozek: "Smart software builds a better harness", MACHINE DESIGN, Vol. 70, No. 8, pages 89 to 92, Cleveland, OH, US, 7 May 1998.

As *obiter dictum*, the examining division upheld its opinion that the subject-matter of claims 2 to 5 lacked inventive step.

- II. In the statement of grounds of appeal, the appellant maintained the sole request considered in the appealed decision.
- III. The appellant was summoned to oral proceedings. In a subsequent communication, the board expressed its preliminary opinion that the subject-matter of all the claims lacked inventive step over document D1, when taking into account decision G 1/19 on the patentability of computer-implemented simulations.
- IV. With a letter of reply the appellant filed an auxiliary request.
- V. Oral proceedings were held as scheduled. At the end of the oral proceedings, the Chair announced the board's decision.

VI. The appellant's final requests were that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request or, in the alternative, of the auxiliary request.

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

"A wire harness wiring path design aiding apparatus comprising:

a designing unit which designs a wiring path of a wire harness by using body data on an object to which the wire harness is installed and three-dimensional data on an auxiliary device installed on a vehicle body;

a storing unit which stores data on a minimum bending radius of the wire harness; and

a checking unit which judges whether the wiring path data designed by the designing unit satisfies the minimum bending radius, and outputs, if the wiring path data does not satisfy the minimum bending radius, data on corrected wiring path data designed in light of the minimum bending radius, characterised in that

the storing unit stores, as the data on the minimum bending radius, a first minimum bending radius defined based on properties of material of the wire harness and a second minimum bending radius defined based on force of worker's hand, and

wherein the apparatus includes a selecting unit which, when the first minimum bending radius differs from the second minimum bending radius, selects one of the first and second minimum bending radii which has larger minimum bending radius."

VIII. Claim 1 of the auxiliary request differs from claim 1 of the main request in that the the following text has been added at the end:

", and

wherein it is judged whether a pattern of the wiring path designed with taking the selected minimum bending radius into consideration interferes with the vehicle body, and when it is determined that the pattern of the wiring path does not interfere with the vehicle body, the wiring path of the wire harness is corrected with the pattern of the wiring path designed taking the selected minimum bending radius into consideration."

- IX. The appellant's arguments, where relevant to this decision, are addressed in detail below.

Reasons for the Decision

Application

1. The application concerns an apparatus and method for aiding a design of wiring paths of wire harnesses in a three-dimensional space such as a vehicle body. The design takes into consideration three-dimensional data of a body in which the wire harness is installed, a minimum bending radius of the wire harness which varies depending on a type and the number of wires to be bundled into a wire harness, and a type of the covering of the wire harness (see application as filed, page 1, lines 5 to 15; page 3, lines 4 to 8).

Main request

Inventive step - claim 1

2. Document D1 discloses the EMbassy software that generates virtual wire-harness prototypes for verification (see page 89, subtitle). The software

takes into account electrical cable and wiring data, mechanical component installation and layout data (including 3D models of housings) and detailed component specifications, and it generates wire lists, bills of materials, and nailboard and harness drawings (page 90, figure, including its caption, and description of the EMbassy program on pages 89 and 90). It takes into account minimum bend radii and mechanical interferences in the space available in the assembly to design the structural assemblies that determine wire routing (page 89, right-hand column; page 91, upper figure).

- 2.1 The board agrees with the examining division that document D1 discloses the features of the preamble of claim 1. This has not been contested by the appellant.
- 2.2 In addition, document D1 discloses storing a first minimum bending radius based on properties of the wire harness material (page 92, left-hand column, last two full paragraphs). The distinguishing features are therefore the following:
 - (d1) the storing unit also stores a second minimum bending radius based on force of the worker's hand,
 - (d2) a selecting unit selects the largest of the first and second minimum radii if they differ.
3. Claim 1 concerns an apparatus for computer aided design of a wire harness wiring path which outputs "data on corrected wiring path" as a final result. It thus relates to a design process which uses computer-implemented simulation to produce numerical data describing a wiring path. The distinguishing features result in wiring path data being output by the

apparatus which take into account the force of the worker's hand.

4. The claimed subject-matter is thus analogous to a computer-implemented simulation of a technical system. Its patentability is to be assessed taking into account the criteria established by the recent decision G 1/19 of the Enlarged Board of Appeal on the patentability of computer implemented simulations (OJ EPO 2021, A77).
- 4.1 According to decision G 1/19, if a claimed process results in a set of numerical values, it depends on the further use of such data (which use can happen as a result of human intervention or automatically within a wider technical process) whether a resulting technical effect can be considered in the inventive step assessment. If such further use is not, at least implicitly, specified in the claim, it will be disregarded for this purpose (point 124).
- 4.2 Calculated numerical data reflecting the physical behaviour of a system modelled in a computer usually cannot establish the technical character of an invention even if the calculated behaviour adequately reflects the behaviour of a real system underlying the simulation. Only in exceptional cases may such calculated effects be considered implied technical effects (for example, if the potential use of such data is limited to technical purposes) (point 128).
- 4.3 In section V, decision G 1/19 presents its conclusions for the application of the COMVIK approach to simulations. It explains that the underlying models of the simulation may contribute to technicality if, for example, they form the basis for a further technical use of the outcomes of the simulation (e.g. a use having an impact on physical reality). In order to

avoid patent protection being granted to non-patentable subject-matter, such further use has to be at least implicitly specified in the claim (points 136 and 137).

- 4.4 Decision G 1/19 provides some examples of further technical uses of the numerical data resulting from a simulation, which under certain conditions may be potential uses, implicitly specified or implied by the claim. One example is the use of the data in a manufacturing step, which "would of course be an argument in favour of patentability" (point 134).
- 4.5 Another example of a further technical use is the use of the data in controlling a technical device, which can be recognised if the resulting numerical data is specifically adapted for "the purposes of its intended technical use", i.e. for controlling a technical device (point 94). In that case, the data is considered to have a technical character because it has the potential to cause technical effects. Either the technical effect that would result from the intended use of the data could be considered "implied" by the claim, or the intended use of the data (i.e. the use in connection with a technical device) could be considered to extend across substantially the whole scope of the claimed data processing method (point 94). These arguments cannot be made if claimed data or data resulting from a claimed process has relevant uses other than the use with a technical device (point 95).
5. In support of inventive step, the appellant argued that the distinguishing features achieved a technical benefit over D1 by providing a wiring harness design capable of being installed simply and effectively in circumstances where a design output by the system of document D1 would not. By providing the second minimum radius based on the force achievable using an

assembler's hand, the invention was "able to generate the design of a wiring harness which is easier to manufacture, yet which also does not have excessive stress generated on it, and yet which is also of as short a distance as possible in order to reduce cost and weight, as well as potentially improve the reliability of the systems utilising that harness through shorter communications paths". The distinguishing features ensured the manufacturability of the design.

- 5.1 Citing decision G 1/19, points 128 and 137, the appellant argued that the claimed invention produced data that allowed manufacturing the wire harness. The numerical data produced by the claimed apparatus reflected the physical structure of the designed wiring path and not merely the physical behaviour of a simulated system. The claim specified at least implicitly a further use of the designed wire harness which had an impact on physical reality, and therefore fulfilled the requirements expressed in G 1/19, point 137. As with a claim to a bicycle that did not need to specify that the bicycle had two wheels, there had to be a limit to which features had to be specified in the claim for recognising the technical purpose. The claim explicitly specified that the design aiding apparatus comprised a designing unit and that the wiring harness was installed in a vehicle body. It was sufficient to show that the end result had, at least implicitly, a technical purpose. It was clear from the claim that the technical area of the invention was the installation of the wiring harness along the path.
6. The board is however not convinced that the distinguishing features contribute to a technical

effect in accordance with the criteria established by decision G 1/19.

- 6.1 The only purpose of the wire harness wiring path design aiding apparatus according to claim 1 is to output "data on corrected wiring path data", which is numerical data about the wiring path design. As explained above, the distinguishing features result in wiring path data being output by the apparatus which takes into account the force of the worker's hand.

Claim 1 does not specify any further use of the output wiring path data, further properties or specific data format that could limit the possible uses of the data. In view of that, other relevant uses of the output data for non-technical purposes, for example informational, study or training purposes, are within the scope of the claim. Since the data can be output in any form or format, it cannot be considered to be specifically adapted for the purposes of an intended technical use. In particular, the output data is not specifically adapted to be used in controlling a technical device or manufacturing a wiring path.

It can thus be concluded that the data produced by the apparatus of claim 1 is not limited to a further technical purpose and does not contribute to an "implied" technical effect that is to be taken into account in the assessment of inventive step.

- 6.2 Furthermore, the distinguishing features do not include any inventive details of the computer implementation, and the appellant has not argued otherwise.
- 6.3 Therefore, the subject-matter of claim 1 lacks an inventive step (Article 56 EPC).

Auxiliary request

Admissibility

7. With its submission of the auxiliary request, the appellant argued that admitting the request was justified in view of the recent issuance of decision G 1/19 and stated that the additional features of the auxiliary request established a clear link between the creation of the present invention and the installation of a harness within a vehicle to provide a technical effect.

8. The auxiliary request was submitted in reply to the board's preliminary opinion, which based the inventive step assessment on the criteria recently established by G 1/19. By adding the constraint that the wiring path does not interfere with the body of a vehicle, the amendments constitute a genuine attempt to address the board's inventive-step objection by adding features to the claim which might contribute to a technical outcome of the design aiding apparatus.

In the board's view, these are exceptional circumstances for admitting the request under Article 13(2) RPBA 2020. Therefore, the auxiliary request is admitted into the proceedings.

Clarity - claim 1

9. The board understands the first part of claim 1 of the auxiliary request, which is identical to claim 1 of the main request, as specifying an apparatus which comprises:
 - (a) a designing unit which designs a wiring path of a wire harness taking into account "body data on an object to which the wire harness is installed and

- three-dimensional data on an auxiliary device installed on a vehicle body"
- (b) a storing unit which stores two minimum bending radii, one based on the material properties and one based on the worker's physical strength ("force of worker's hand");
 - (c) a selecting unit which selects a minimum bending radius as the largest of the two radii;
 - (d) a checking unit which checks ("judges") whether the designed wiring path satisfies the minimum bending radius and if not outputs "data on a corrected wiring path data" designed based on the minimum bending radius.

Compared with claim 1 of the main request, claim 1 of the auxiliary request includes the following additional features:

- (e) wherein it is judged whether a pattern of the wiring path designed with taking the selected minimum bending radius into consideration interferes with the vehicle body, and when it is determined that the pattern of the wiring path does not interfere with the vehicle body, the wiring path of the wire harness is corrected with the pattern of the wiring path designed taking the selected minimum bending radius into consideration.

10. In reaction to the board's objections that these additional features rendered the claim unclear (as explained in detail below), the appellant argued that it was clear from the claim that the harness was installed in a vehicle body and that the purpose of the claimed apparatus was to create a valid set of information to follow to manufacture. The judgement step of the additional features of the auxiliary

request was a further judgement performed also by the checking unit, which had the purpose of outputting correct wiring path data.

11. The board does not find these arguments convincing.
- 11.1 It is not clear what a "pattern" of a wiring path is and what is meant by "the wiring path [...] is corrected with the pattern of the wiring path". No clear definition of a "pattern" of a wiring path can be derived from the claim nor from the description. The term "pattern" is used only three times in the description, once in the same context as in the additional features (e) and twice in the description of Figure 2B to refer to the "pattern of the curved part". None of these passages provides a clear definition of the term.
- 11.2 It is further not clear from apparatus claim 1 what "wherein" in "wherein it is judged ..." refers to. The additional features introduce a number of steps but do not link them to any of the defined units of the apparatus. In particular, it is not clear that the judgement step is performed by the checking unit, as argued by the appellant.
- 11.3 The additional features of claim 1 of the auxiliary request refer to "the wiring path designed taking the selected minimum bending radius into consideration", but there is no antecedent for that feature in the claim. In the specification of the checking unit (see feature (d) above), claim 1 mentions "corrected wiring path data designed in light of the minimum bending radius", but it is not clear whether and how this feature is related to "the wiring path designed taking

the selected minimum bending radius into consideration".

12. Therefore, claim 1 of the auxiliary request is unclear (Article 84 EPC).

Concluding remark

13. Since none of the requests is allowable, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chair:



S. Lichtenvort

J. Geschwind

Decision electronically authenticated