This report was prepared by the EPO and the JPO.
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Summary

- The European Patent Office (EPO) and the Japan Patent Office (JPO) both grant patents on software related or computer implemented inventions. At both these offices, two separate requirements are of particular relevance in relation to computer implemented inventions (CIIs): firstly, the requirement that the claimed invention must be a statutory “invention”, and secondly that the requirement must be novel and involve an inventive step. At the EPO, for example, a method claim that requires the presence of technical means (e.g. a computer, a network, the internet) is regarded as an “invention” that is statutory within the meaning of the European Patent Convention (EPC), Article 52. As system or device claims are always regarded as statutory “inventions” by definition, it is therefore easier to comply with the statutory “invention” requirement at the EPO rather than at the JPO.

- At the EPO, the focus on the non-technical features of computer implemented inventions is directed to the inventive step assessment, resulting in a more stringent assessment of inventive step compared to the JPO. The difference between the two offices' approaches is significant especially when claims include features which are considered non-technical. At the JPO, during the inventive step assessment, no distinction is made between features which are technical and those which are not. At the EPO, all the non-technical features which do not contribute to the technical character of the invention are not taken into account when assessing inventive step.

- Based on these different approaches to assessing inventive step, i.e. whether to take the non-technical features into account or not, in some cases in Chapter III of this report (Comparative study on case examples), the EPO determines that the claims do not involve an inventive step whereas the JPO determines that they do.
• At the JPO, structured data, or data structure which is equivalent to a program, can be regarded as a statutory “invention”. At the EPO, the patentability of computer data structures is examined according to the Guidelines for Examination in the European Patent Office (EPGL), Part G, Chapter II, 3.7 and 3.7.2. These sections of EPGL reflect pertinent case law of the EPO Boards of Appeal.
I. Introduction
**Comparative Study on Examination Practices**

While the Patent Offices are continuously working hard to manage the backlog of patent applications, it is important that the Offices do not lose sight of the quality aspect of the examination. In order to enhance the quality of the examination, examiners need to understand the invention properly based on the description. It is therefore critical that an applicant prepares a well-drafted application.

While the quality of the examination relies on the quality of the incoming application, higher quality patent applications will enable applicants to cut costs for making amendments or drafting responses. With this in mind, the EPO and the JPO decided to conduct the current comparative study.

**Comparative Study on Software Related Inventions**

Research and development on new technologies such as IoT [Internet of Things], AI [Artificial Intelligence] or 3D printing, which are promoting the 4th industrial revolution, are currently being actively conducted. Since the inventions that form the core of those technologies are software related, it is important to show applicants each Offices’ current examination practices on software related inventions, which will have changed from past comparative studies.

In view of these circumstances, the EPO and the JPO decided to conduct the comparative study on software related inventions in order to reveal the similarities and differences of examination practices specific to software related inventions.

It is worth noting that this report is focused on the examination practices specific to software related inventions. The results of this comparative study have only indicative meaning and are not legally binding on the offices.
# Explanatory Notes

<table>
<thead>
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<th>Abbreviation</th>
<th>Description</th>
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<td>EPO</td>
<td>European Patent Office</td>
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- **software related invention**
  - computer implemented invention (EPO)
  - computer software related invention (JPO)
Ⅱ. Comparative study on laws, regulations or guidelines
The requirement of claiming statutory “inventions”

1. **Non-excluded / eligible subject matters**

At the EPO, the EPC does not define what is meant by "invention", but EPC Article 52(2)\(^1\) contains a non-exhaustive list of things which are excluded from patentability, i.e. not regarded as statutory “inventions”, if claimed as such (EPC Article 52(3)\(^2\)). It will be noted that the items on this list are all either abstract (e.g. discoveries or scientific theories) and/or non-technical (e.g. aesthetic creations or presentations of information). In contrast to this, a statutory "invention" within the meaning of EPC Article 52(1)\(^3\) must be of both a concrete and a technical character. It may be in any field of technology.

At the JPO, JPA Article 2(1)\(^4\) defines an eligible "invention" as "the highly advanced creation of technical ideas utilizing the laws of nature." An invention which does not comply with this definition shall be rejected based on the main paragraph of JPA Article 29(1)\(^5\). It is also noted that JPA Article 2(3)\(^6\) stipulates a computer program etc. is included in the term "a product"

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\(^1\) EPC Article 52(2)

The following in particular shall not be regarded as inventions within the meaning of paragraph 1:

(a) discoveries, scientific theories and mathematical methods;
(b) aesthetic creations;
(c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;
(d) presentations of information.

\(^2\) EPC Article 52(3)

Paragraph 2 shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such.

\(^3\) EPC Article 52(1)

European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.

\(^4\) JPA Article 2(1)

"Invention" in this Act means the highly advanced creation of technical ideas utilizing the laws of nature.

\(^5\) JPA Article 29(1)

An inventor of an invention that is industrially applicable may be entitled to obtain a patent for the said invention, except for the following: ...

\(^6\) JPA Article 2(3)

"Working" of an invention in this Act means the following acts:

(i) in the case of an invention of a product (including a computer program, etc., the
which is one of the categories of the inventions.

2. **List of excluded / ineligible subject matters**

   With regard to the EPO, specific subject-matters shall not be regarded as statutory "inventions" if claimed as such. A non-exhaustive list of such excluded subject-matters is described in the EPC Article 52(2) and (3) and EPGL, Part G, Chap. II, 3.

   With regard to the JPO, a list of ineligible subject-matters not corresponding to statutory "inventions" is described in JPGL, Part III, Chap. 1, 2.1.

   In addition to these subject-matters, specific subject-matters regarding software related inventions shall not be regarded as statutory "inventions", which are described in JPHB, Annex B, Chap. 1. Details are described in the next section "4. Approach for assessing whether a software related invention is a statutory “invention” or excluded / ineligible subject-matter.

   The following table is a comparison of excluded or ineligible subject-matters in the EPO and the JPO, respectively. Corresponding items are underlined in the same manner.

<table>
<thead>
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<th>EPO</th>
<th>JPO</th>
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<tr>
<td>The following shall not be regarded as &quot;inventions&quot; if claimed as such:</td>
<td>The following are subject matters not corresponding to statutory</td>
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same shall apply hereinafter), producing, using, assigning, etc. (assigning and leasing and, in the case where the product is a computer program, etc., including providing through an electric telecommunication line, the same shall apply hereinafter), exporting or importing, or offering for assignment, etc. (including displaying for the purpose of assignment, etc., the same shall apply hereinafter) thereof:

(ii) in the case of an invention of a process, the use thereof; and

(iii) in the case of an invention of a process for producing a product, in addition to the action as provided in the preceding item, acts of using, assigning, etc., exporting or importing, or offering for assignment, etc. the product produced by the process.

JPA Article 2(4)

A "computer program, etc." in this Act means a computer program (a set of instructions given to an electronic computer which are combined in order to produce a specific result, hereinafter the same shall apply in this paragraph) and any other information that is to be processed by an electronic computer equivalent to a computer program.
- discoveries, scientific theories and mathematical methods;
- aesthetic creations;
- schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;
- presentations of information

"inventions" described in JPGL, Part III, Chap. 1, 2.1:
- A law of nature as such
- Mere discoveries and not creations
- Those contrary to a law of nature
- Those in which a law of nature is not utilized, e.g. (i) any laws other than a law of nature (e.g., economic laws), (ii) arbitrary arrangements (e.g., a rule for playing a game as such), (iii) mathematical formula, (iv) mental activities of humans or (v) those utilizing only (i) to (iv) (e.g., methods for doing business as such)
- Those not regarded as technical ideas, e.g. personal skill, mere presentation of information or mere aesthetic creations
- Those for which it is clearly impossible to solve the problem to be solved by any means presented in a claim

3. Claim format

At both the EPO and the JPO, the following claim formats are acceptable.

(1) A method …
(2) An apparatus/system …
(3) A computer program …

7 With regard to the EPO, see EPGL, Part F, Chap. IV, 3.9.1. which stipulates: "A computer-implemented method ...") or "A method carried out by a computer ..."
(4) A computer program product ...¹⁰
(5) A computer-readable storage medium ...

At the EPO, "A data structure embodied on a medium or as an electromagnetic carrier wave ..." is an acceptable claim format. However, regarding patentability of computer data, at the EPO, the patentability of computer data structures is examined according to EPGL, Part G, Chap. II, 3.7 and 3.7.2. These sections of EPGL reflect pertinent case law of the EPO Boards of Appeal.

At the JPO, "Structured data ..." or "A data structure ..." is an acceptable claim format regardless of whether the structured data or a data structure is stored in a medium or not.

With regard to the EPO, EPC Rule 43(2)¹⁰ requires that there should be only one independent claim per category. Categories can be either one of product, process, apparatus, or use. For software related inventions, the following are considered acceptable independent claim formulations:

(1) A method ... (process)
(2) An apparatus/system ... (apparatus)

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¹ With regard to the JPO, see JPHB, Annex B, Chap. 1, 1.2.1.2. If it is clear in consideration of description and drawings as well as the common general knowledge as of the filing that the claimed invention is a "program" even though the claimed subject matter is any word other than the "program" (for example, "module", "library", "neural network", "support vector machine" or "model") the claimed invention is handled as the "program."

² With regard to the JPO, see JPHB, Annex B, Chap. 1, 1.2.1.2. When the claim is a computer program product, the claimed invention is handled as what it means, as long as it is clear in consideration of the detailed description of the invention that it means any of (a) · (c) below. If this is not the case, the claimed invention will breach clarity requirement, because the scope of the invention is unclear.
(a) A "program" itself
(b) A "recording medium in which a program is recorded"
(c) A system into which a program is read, such as a "computer system into which a program is read"

¹⁰ EPC Rule 43(2)
Without prejudice to Article 82, a European patent application may contain more than one independent claim in the same category (product, process, apparatus or use) only if the subject-matter of the application involves one of the following:
(a) a plurality of interrelated products,
(b) different uses of a product or apparatus,
(c) alternative solutions to a particular problem, where it is inappropriate to cover these alternatives by a single claim.
A computer program ... (product, normally acceptable)

A computer program product ... (product, normally acceptable)

A computer-readable storage medium ... (product, normally acceptable)

The JPO does not have the similar requirement of "only one independent claim per category." More than one independent claim is acceptable as long as those claims meet the requirement of unity.

4. Approach for assessing whether a software related invention is a statutory “invention” or excluded / ineligible subject-matter

The EPO's approach for assessing whether a software related invention meets the requirement of defining an “invention” within the meaning of EPC Article 52(1), (2), (3) is described in EPGL, Part G, Chap. II, in particular 3.6 and 3.7.2.

Inventions involving programs for computers can be protected in different forms of a "computer-implemented invention", an expression intended to cover claims which involve computers, computer networks or other programmable apparatus whereby prima facie one or more of the features of the claimed invention are realised by means of a program or programs.

The basic patentability considerations in respect of claims for computer programs are in principle the same as for other subject-matter. While "programs for computers" are included among the items listed in EPC Article 52(2), if the claimed subject-matter has a technical character it is not excluded from patentability by the provisions of EPC Article 52(2) and (3).

Technical character should be assessed without regard to the prior art (see T 1173/97, confirmed by G 3/08). Features of the computer program itself (see T 1173/97) as well as the presence of a device defined in the claim (see T 424/03 and T 258/03) may potentially lend technical character to the claimed subject-matter as explained below. In particular in embedded systems, a data processing operation implemented by means of a computer program...
running on a computer can equally be implemented by means of special circuits (e.g. by field-programmable gate arrays).

A computer program claimed by itself is not excluded from patentability if it is capable of bringing about, when running on a computer, a further technical effect going beyond the "normal" physical interactions between the program (software) and the computer (hardware) on which it is run (T 1173/97 and G 3/08). The normal physical effects of the execution of a program, e.g. electrical currents, are not in themselves sufficient to lend a computer program technical character, and a further technical effect is needed. The further technical effect may be known in the prior art.

Similarly, although it may be said that all computer programming involves technical considerations since it is concerned with defining a method which can be carried out by a machine, that in itself is not enough to demonstrate that the program which results from the programming has technical character: the programmer must have had technical considerations beyond "merely" finding a computer algorithm to carry out some procedure (G 3/08).

A further technical effect which lends technical character to a computer program may be found e.g. in the control of an industrial process or in the internal functioning of the computer itself or its interfaces under the influence of the program and could, for example, affect the efficiency or security of a process, the management of computer resources required or the rate of data transfer in a communication link. A computer program implementing a method that itself makes a technical contribution would also be considered to be capable of bringing about a further technical effect when it is run on a computer.

Whether a computer program can contribute to the technical character of the claimed subject-matter is frequently an issue separate and distinct from the technical character of the hardware components which may be defined in order to execute the computer program. When a computer program produces a further technical effect (T 1173/97), it is by itself considered technical and not excluded. In contrast, any claimed subject-matter defining or using technical means is an invention within the meaning of EPC Article 52(1) (see T 424/03 and T 258/03, and confirmed in G 3/08). This applies even if the technical means are commonly known: for example, the inclusion of a computer, a computer network, a readable medium carrying a program, etc.
in a claim lends technical character to the claimed subject-matter.

If claimed subject-matter relating to a computer program does not have a technical character, it should be rejected under EPC Article 52(2) and (3). If the subject-matter passes this test for technicality, the examiner should then proceed to the questions of novelty and inventive step.

A patent may be granted on one of the different forms of a computer program product claim if all the requirements of the EPC are met; see in particular EPC Article 84, 83, 54 and 56. Such claims should not contain program listings, but should define all the features which assure patentability of the process which the program is intended to carry out when it is run. Short excerpts from programs might be accepted in the description.

Regarding data retrieval, formats and structures, a computer-implemented data structure (see T 1194/97) or a computer-implemented data format embodied on a medium or as an electromagnetic carrier wave has technical character (because the storage medium is a technical artefact; a claim to a data structure has to refer to technical means, e.g. to the technical features of the system in which it is used) and thus is an invention in the sense of EPC Article 52(1). Such data structures or formats may comprise a mixture of cognitive content and functional data.

Technical effects associated with data structures or formats when using said data structure or format during the operation of a computer system could give rise to, for example: efficient data processing, efficient data storage, enhanced security. On the other hand, features merely describing data collections on a logical level do not provide a technical effect, even if such a description might involve a particular modelling of the described data.

When assessing the patentability of data structures and data formats, the nature of the data needs to be assessed. **Functional data**, for example, are used to control a device which processes the data and inherently comprise technical features of the controlled device. **Cognitive data**, on the other hand, are only relevant to human users. Functional data may form the basis of a technical effect whereas cognitive data do not.

For these reasons the examiner should check whether the data structure
as claimed inherently comprises or reflects the technical features of the system or the steps of a corresponding method which forms the basis of the technical effect.

At the EPO the patentability of computer data structures is examined according to EPGL, Part G, Chap. II, 3.7 and 3.7.2. These sections of EPGL reflect pertinent case law of the EPO Boards of Appeal.

At the JPO, the approach for assessing whether a software related invention relates to a statutory "invention" or ineligible subject-matter is described in JPHB, Annex B, Chap.1, 2.1.

There are up to two steps for making that assessment: firstly the determination based on JPGL, Part III, Chap. 1 and secondly the determination according to the "idea based on the standpoint of software."

First of all, the examiner reviews whether or not the claimed software related invention is "creation of a technical idea utilizing a law of nature", based on JPGL, Part III, Chap. 1.

The examiner does not review according to the "idea based on the standpoint of software" if a determination on whether or not the claimed software related invention is "creation of a technical idea utilizing a law of nature" is made based on JPGL, Part III, Chap. 1. In other words, during this review, the examiner does not need to take into consideration whether the claimed invention is in fact implemented in software.

If not, the examiner shall make a determination according to the "idea based on the standpoint of software".

When making the determinations, the examiner reviews whether or not the claimed invention as a whole is "creation of a technical idea utilizing a law of nature", irrespective of some recitations in the claims.

Regarding the determination based on JPGL, Part III, Chap. 1, those utilizing a law of nature as a whole and being considered as a "creation of a technical idea utilizing a law of nature" irrespective of whether computer software is utilized (e.g., (i) or (ii) shown below) constitute a statutory "invention" without being examined from a viewpoint of computer software.
Computer software for causing a computer to execute a method, which is a "creation of a technical idea utilizing a law of nature" and thus constitutes a statutory "invention", or a computer or system for executing such method is normally a creation of a technical idea utilizing a law of nature as a whole, and thus, it constitutes a statutory "invention".

(i) Those concretely performing control of an apparatus (e.g., rice cooker, washing machine, engine, hard disk drive, chemical reaction apparatus, nucleic acid amplifier), or processing with respect to the control

(ii) Those concretely performing information processing based on the technical properties such as physical, chemical, biological or electric properties of an object (e.g., rotation rate of engine, rolling temperature, relation between gene sequence and expression of a trait in a living body, physical or chemical relation of bound substances)

When the claimed software related invention falls under any type of JPGL, Part III, Chap. 1, 2.1, the claimed invention is not "creation of a technical idea utilizing a law of nature."

Regarding the determination according to the "idea based on the standpoint of software", if it is not determined based on JPGL, Part III, Chap. 1, whether or not the claimed software related invention falls under the "creation of a technical idea utilizing a law of nature", the examiner shall determine on requirements of "creation of a technical idea utilizing a law of nature" depending on whether or not "information processing by software is specifically implemented by using hardware resources" in a software related invention: that is to say, whether or not a specific information processor or an operation method thereof depending on intended use is constructed through cooperation of software and hardware resources.

As this specific determination approach, the examiner may determine based on the statement of the claims whether or not specific calculation or processing of information depending on the intended use is implemented by specific means or procedures on which software and hardware resources cooperate.

With regard to the handling of structured data or data structure, the examiner shall determine whether structured data or data structure is
equivalent to a program, that is, whether structured data or data structure has characteristics similar to a program in that the structure of the data specifies the processing of the computer. Structured data or data structure is determined as software when it is equivalent to a program. Even if it is data having structure or data structure, it is not determined as software when it is not equivalent to a program.

Regarding whether structured data (including a computer readable recording medium in which structured data is recorded) or data structure falls under a "creation of the technical idea utilizing a law of nature" or not, the examiner shall determine according to the approach mentioned above.

When the determination on the eligibility of structured data or data structure according to the "idea based on the standpoint of software" is made, the examiner shall determine the requirements of a "creation of the technical idea utilizing a law of nature", according to whether or not information processing specified by a structure that data has is specifically implemented by using hardware resources.
A. Novelty

1. Invention of sub-combination

In cases where an invention of overall apparatuses or an invention of method of manufacturing a product (hereinafter referred to as "combination") is formed by combining two or more apparatuses or processes, sub-combination is defined as an invention of each apparatus or each process of the combination.

At the EPO, EPGL does not have the explicit description of novelty or an inventive step concerning a claimed invention of sub-combination, including an expression specifying the invention of sub-combination by elements of other sub-combination. However, EPGL, Part G, Chap. VII, 7 refer explicitly to juxtaposition of technical features, making a distinction between pure juxtaposition (which does not create new functionality), and combination, which does.

At the JPO, the matters which the examiner should take into consideration in examining novelty or an inventive step concerning a claimed invention of sub-combination including an expression specifying the invention of sub-combination by elements of other sub-combination are described in JPGL, Part III, Chap. 2, 4.

The examiner should consider elements relevant to "another sub-combination" stated in the claim and not ignore them in specifying the claimed invention. The examiner should also understand the role which the elements have in specifying the sub-combination invention from the aspect of its shape, structure, constituent element, composition, operation, function, property, characteristic, method (an act or action), use, etc. (hereinafter referred to as "a structure, function, etc.") when he/she specifies the claimed sub-combination invention. In this regard, the examiner takes into account the statements of the description and drawings as well as the common general knowledge at the time of filing.

In cases where an element relevant to "another sub-combination" has a role in specifying a structure, function, etc. of the claimed sub-combination invention, the examiner understands that the claimed sub-combination
invention has such a structure, function, etc. If there is a difference between a sub-combination invention and a cited prior art, the examiner determines that the sub-combination invention involves novelty.

In cases where an element relevant to "another sub-combination" specifies only "another sub-combination" and does not specify a structure, function, etc. of the claimed sub-combination invention at all, the examiner specifies the invention on the premise that the element relevant to "another sub-combination" does not have a role in specifying the claimed sub-combination invention. If no differences exist except for a difference between elements relevant to "another sub-combination" and elements specifying a cited prior art in view of a description or an expression, there are no differences between the claimed sub-combination invention and the cited prior art in terms of a structure, function, etc. Therefore, the examiner determines that the sub-combination invention does not involve novelty.
B. Inventive step

1. Claims comprising technical and non-technical features

At the EPO, the treatment of claims comprising technical and non-technical features is described in EPGL, Part G, Chap. VII, 5.4.

It is legitimate to have a mix of technical and non-technical features appearing in a claim, as is often the case with computer-implemented inventions. The non-technical features may even form a major part of the claimed subject-matter. However, in the light of EPC Article 52(1), (2) and (3), the presence of an inventive step under EPC Article 56 requires a non-obvious technical solution to a technical problem (T 641/00, T 1784/06).

When assessing the inventive step of such a mixed-type invention, all those features which contribute to the technical character of the invention are taken into account. These also include the features which, when taken in isolation, are non-technical, but do, in the context of the invention, contribute to producing a technical effect serving a technical purpose, thereby contributing to the technical character of the invention. However, features which do not contribute to the technical character of the invention cannot support the presence of an inventive step (T 641/00). Such a situation may arise, for instance, if a feature contributes only to the solution of a non-technical problem, e.g. a problem in a field excluded from patentability.

The problem-solution approach is applied to mixed-type inventions in such a way as to ensure that inventive step is not acknowledged on the basis of features not contributing to the technical character of the invention, while all those features which do contribute are properly identified and taken into account in the assessment. To this end, where the claim refers to an aim to be achieved in a non-technical field, this aim may legitimately appear in the formulation of the objective technical problem as part of the framework of the technical problem that is to be solved, in particular as a constraint that has to be met (T 641/00; see step (iii)(c) below).

The steps below outline the application of the problem-solution approach to mixed-type inventions:

(i) The features which contribute to the technical character of the invention are determined on the basis of the technical effects achieved in the context of the invention.
(ii) A suitable starting point in the prior art is selected as the closest prior art based on the features contributing to the technical character of the invention identified in step (i).

(iii) The differences from the closest prior art are identified. The technical effect(s) of these differences, in the context of the claim as a whole, is(are) determined in order to identify from these differences the features which make a technical contribution and those which do not.

(a) If there are no differences (not even a non-technical difference), an objection under EPC Article 54 is raised.

(b) If the differences do not make any technical contribution, an objection under EPC Article 56 is raised. The reasoning for the objection should be that the subject-matter of a claim cannot be inventive if there is no technical contribution to the prior art.

(c) If the differences include features making a technical contribution, the following applies:
   - The objective technical problem is formulated on the basis of the technical effect(s) achieved by these features. In addition, if the differences include features making no technical contribution, these features, or any non-technical effect achieved by the invention, may be used in the formulation of the objective technical problem as part of what is "given" to the skilled person, in particular as a constraint that has to be met.
   - If the claimed technical solution to the objective technical problem is obvious to the person skilled in the art, an objection under EPC Article 56 is raised.

Determination of the features contributing to the technical character of the invention should be performed for all claim features in step (i) (T 172/03, T 154/04). However, in practice, due to the complexity of this task, the examiner can normally perform the determination in step (i) on a prima facie basis only and perform the analysis at the beginning of step (iii) in a more detailed manner. In step (iii), the technical effects achieved by the differences over the selected closest prior art are determined. The extent to which the differences contribute to the technical character of the invention is analysed in relation to these technical effects. This analysis, limited to the differences, can be performed in a more detailed manner and on a more concrete basis.
than the one performed at step (i). It may therefore reveal that some features considered in step (i) prima facie as not contributing to the technical character of the invention do, on closer inspection, make such a contribution. The reverse situation is also possible. In such cases, the selection of the closest prior art in step (ii) might need to be revised.

When performing the analysis in steps (i) and (iii) above, care should be taken to avoid missing any features that might contribute to the technical character of the claimed subject-matter, in particular if the examiner reproduces his understanding of the subject-matter of the claim in his own words during the analysis (T 756/06).

At the JPO, specifying claimed invention is described in JPGL, Part III, Chap. 2, Sec. 3.

The examiner specifies the claimed invention and the prior art, and then compare both in determining novelty and an inventive step.

Regarding the claimed invention, the examiner specifies the claimed invention based on the claim. The examiner takes the description, drawings and the common general knowledge at the time of filing into consideration in interpreting the meanings of words in the claims. The examiner should always consider the matters or terms described in the claims and should not ignore them.

When specifying a software related invention, it is appropriate to understand an invention as a whole, while it is not appropriate to specify it by dividing it into arbitrary arrangements or the like and systemization methods, as described in JPHB, Annex B, Chap. 1, 2.2.1.

At the JPO, during the inventive step assessment, no distinction is made between features which are technical and those which are not.
C. General trend of examination results

The EPO and JPO both grant patents on software related inventions. At both these offices two separate requirements are of particular relevance in relation to Computer Implemented Inventions (CIIs). Firstly, the requirement that the claimed invention must be statutory “invention”, and secondly, that the requirement must be novel and involve an inventive step. At the EPO, a method claim that requires the presence of technical means (e.g. a computer, a network, the internet) is regarded as an “invention” that is statutory in the sense of EPC Article 52(1). System or device claims are always regarded as statutory “inventions” by definition. It is therefore easier to comply with the statutory “invention” requirement at the EPO than at the JPO.

The focus on the non-technical features of software related inventions at the EPO is directed to the inventive step assessment, resulting in a more stringent assessment of inventive step compared to the JPO. The difference between the two offices' approaches is significant, particularly when claims include features which are considered non-technical. At the JPO, during the inventive step assessment, no distinction is made between features which are technical and those which are not. At the EPO, all the non-technical features which do not contribute to the technical character of the invention are not taken into account when assessing inventive step. This approach does not necessarily require a secondary document to be combined with the closest prior art in order to conclude that the inventive step requirements of the EPC are not complied with. In particular, in software related inventions concerning business methods implemented on computers, there is often not enough technical content in the application to allow the applicant to present a claim that could eventually be considered inventive at the EPO.

The following figure is a picture of the requirements for software related inventions in general.
Software related inventions

EP exclusion from patentability

JP exclusion from patentability

EP inventive step
(technical feature / non-technical feature)

JP inventive step
(normal inventive step)
III. Comparative study on case examples
The outline of the results of the comparative study on case examples is shown below. In the following, ○ means not being refused in terms of excluded or ineligible subject-matter etc., × means being refused and △ means depending on the recitation in the claims, i.e. depending on the exact formulation of the claims.

It is also noted that, when assessing the inventive step, it is necessary to take all the state of the art into consideration but in this the comparative study on case examples the inventive step is assessed only from the matters described under the heading of [State of the art (Prior art, well-known art, etc.)].

A. The requirement of claiming statutory “inventions”

<table>
<thead>
<tr>
<th>Case</th>
<th>Claim 1</th>
<th>Claim 2</th>
<th>Claim 3</th>
<th>Claim 4</th>
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<tbody>
<tr>
<td>A-1</td>
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<tr>
<td>A-2</td>
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<td>A-3</td>
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B. Novelty

<table>
<thead>
<tr>
<th>Case B-1</th>
<th>Claim 1</th>
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<tbody>
<tr>
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<tr>
<td>B-2</td>
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C. Inventive step

<table>
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<tr>
<th>Case C-1</th>
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<td>Case C-3</td>
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<td>Case C-6</td>
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</table>
A. The requirement of claiming statutory “inventions”

1. Case A-1

(From JPHB, Annex A, 3. Case 3-3)

Title of Invention

3D printing data of dolls and a 3D printing method of dolls

What is claimed is:

[Claim 1]

3D printing data of dolls read in a control unit of a 3D printer when a modeling unit of the said 3D printer models, characterized in that it includes three-dimensional shapes and color tones of dolls to be modeled.

[Claim 2]

A 3D printing method of dolls using the said 3D printer based on the 3D printing data of dolls as described in Claim 1, comprising:

a step in which the said control unit reads in the said 3D printing data;

a step in which the said control unit controls the said modeling unit in a way that it dispenses modeling resin based on the three-dimensional shape included in the said 3D printing data; and

a step in which the said control unit controls the said modeling unit in a way that it dispenses colorants of a plurality of colors based on the color tones included in the 3D printing data.

[Claim 3]

The 3D printing data of dolls as described in claim 1 stored in a computer-readable storage medium.

[Claim 4]

A computer-readable storage medium having stored thereon the 3D printing data of dolls as described in claim 1.
Overview of the description

[Technical Field]

The present invention relates to 3D printing data of dolls and a 3D printing method of dolls.

[Background Art]

In general, dolls made of synthetic resin are produced by means of mold injection. However, dolls are produced in small quantities and large varieties so that a number of molds are required to produce these products by means of mold injection. Thus, production costs of dolls increase.

[Problems to be solved by the invention]

The present invention was realized in view of these circumstances and aims to provide dolls to the society at reasonable cost.

[Solution for the Problem to be solved]

(Omitted)

[Effect of Invention]

3D printing data of dolls of the present invention includes three-dimensional shapes and color tones of dolls to be modeled. Dolls can be easily produced by means of a 3D printer and they do not require molds for mold injection. Therefore, dolls will be provided to the society at reasonable cost.

[Conclusion (EPO)]

Claim 1 does not fulfil the requirements of EPC Article 52(2) and (3), i.e. it does not constitute an invention.

Claim 2 constitutes an invention in the sense of EPC Article 52(2) and (3), since it is a method involving technical means (control unit controlling the printing process).

Claim 3 also constitutes an invention in the sense of the EPC Article 52(2) and (3), since it defines 3D printing data stored, or embodied, on a computer-readable storage medium (i.e. the claimed subject-matter requires the presence of technical means). Similarly, claim 4 is an invention in the sense of EPC Article 52(2) and (3), since it directly defines technical means, namely a computer-readable storage medium. Claim 4 is the preferred format for claiming a computer-implemented data format, since one might argue...
that claim 3 merely defines a data format which is abstract and not limited by the feature “stored in a computer-readable storage medium”.

**[Explanation (EPO)]**

- **Claim 1**

  The data defined by claim 1 constitutes presentation of information as such. The meaning of the data claimed (shapes and color tones) is thereby irrelevant, and would rather reinforce the “presentation of information” argument.

  The fact that the data are read in a control unit of a 3D printer is irrelevant as well, because this feature only relates to the purpose of the 3D data, but does not limit the data itself (unlike claim 2, claim 1 does not define a method). Moreover, data itself, when read in the control unit of a 3D printer, does not suffice to develop the requisite technical effect. In particular, 3D data cannot be regarded as functional data, because it is not possible to infer, from the 3D data, the technical features of the system in which the 3D data is used. It is rather the control program that, fed with the data, develops the requisite technical effect.

  At the EPO, the patentability of computer data structures is examined according to EPGL, Part G, Chap. II, 3.7 and 3.7.2. These sections of EPGL reflect pertinent case law of the EPO Boards of Appeal.

- **Claim 2**

  Regarding claim 2, which constitutes an invention (see above), all features of the claim, with the sole exception of the meaning of the data, are considered technical and will be taken into consideration when comparing the claim with the prior art. However, a prior art disclosing any data-driven similar 3D printing process will be relevant, independent of the meaning of the data (and in consequence independent of the printed object) in the prior art.

  The printing data in the context of claim 2 are used to control the printing process (which shape and which color will be given to the object printed, in this specific case a doll), and therefore are relevant during processing. In other words, they are an essential feature of the printing
process, because without this feature, the printing process cannot take place.

- Claim 3

Regarding claim 3, non-functional data by itself, even if stored on a computer-readable storage medium, cannot produce a technical effect (analogous to a computer program lacking a further technical effect, e.g. solving a non-technical financial, administrative, commercial or cognitive task). It is only the interaction of data, control program and 3D printed that eventually produces this technical effect required in the context of assessing inventive step.

- Claim 4

Analogous considerations apply to claim 4 (computer-readable storage medium with 3D printing data). The technical characteristics of the storage medium itself are not affected by the 3D printing data stored thereon. Therefore, the computer-readable storage medium with 3D printing data is, from an inventive step viewpoint, equivalent to a computer-readable storage medium with any data stored thereon.

However, it has to be mentioned that, according to current EPO practice, if a computer program claim has been found allowable, then a computer readable storage medium, storing the program, is allowable as well.

Mere 3D data cannot acquire the status of functional data, because there is not sufficient information to infer the technical features of the system in which the data is used. However, data such as 3D data could be regarded as functional data, if it was enriched with additional features that permit such an inference of corresponding technical features.

[Conclusion (JPO)]

The invention of claim 1 does not fall under "invention."
The invention of claim 2 falls under "invention."
The invention of claim 3 and 4 do not fall under "invention."

[Explanation (JPO)]

- Claim 1
Mere presentation of information (where the feature resides solely in the content of the information, and the main object is to present information), such as presentation of information (presentation per se, means for presentation or method of presentation) in which a technical feature does not reside, does not fall under "invention" ("creation of the technical idea utilizing a law of nature") mentioned in the main paragraph of JPA Article 29(1).

It is an ordinary operation of a 3D printer that the 3D printing data is "read in a control unit of a 3D printer when a modeling unit of the said 3D printer models" as described in Claim 1. The 3D printing data of dolls of Claim 1 does not add any technical feature to the means for or method of reading data in the control unit of the 3D printer, but it is characterized only in the content of information that "it includes three-dimensional shapes and color tones of dolls to be modeled". Therefore, the 3D printing data of Claim 1 does not have technical features in the presentation of information (presentation per se, means for presentation or method of presentation), its feature resides solely in the content of the information, and its main object is to present information.

Therefore, since the 3D printing data of dolls of Claim 1 is mere presentation of information, it is not a creation of the technical idea utilizing a law of nature and thus does not fall under "invention".

- Claim 2

The invention of Claim 2 is a 3D printing method of dolls by a 3D printer using the computer software. The 3D printer controls a modeling unit in a way that it dispenses modeling resin and colorants of a plurality of colors based on three-dimensional shapes and color tones included in the 3D printing data. Therefore, the invention of Claim 2 is what concretely performs control of 3D printer which is an apparatus, or processing with respect to the control.

Therefore, since the invention of Claim 2 is a creation of the technical idea utilizing a law of nature as a whole, it falls under "invention".

- Claim 3 and 4

The same reasons are applied as Claim 1.
2. Case A-2

(From JPHB, Annex B, Chap. 1, 3.2, Case 2-10)

Title of Invention

Method of Allocating Unmanned Autonomous Vehicle

What is claimed is:

[Claim 1]
A system comprising a vehicle allocation server, a portable terminal which a person who desires vehicle allocation has, and unmanned autonomous vehicles,

wherein when the vehicle allocation server receives a vehicle allocation request for the unmanned autonomous vehicle for which a vehicle allocation position is specified from the person who desires the vehicle allocation, the vehicle allocation server allocates unmanned autonomous vehicle to the person who desires the vehicle allocation.

[Claim 2]
A method implemented in a system comprising a vehicle allocation server, a portable terminal which a person who desires vehicle allocation has, and unmanned autonomous vehicles,

wherein when the vehicle allocation server receives a vehicle allocation request for the unmanned autonomous vehicle for which a vehicle allocation position is specified from the person who desires the vehicle allocation, the vehicle allocation server allocates unmanned autonomous vehicle to the person who desires the vehicle allocation.
Overview of the description

[Background Art]

The present invention relates to a service utilizing unmanned autonomous vehicles for which a driver are unnecessary and is capable of performing autonomous driving within a predetermined site in an amusement park, a theme part or the like.

[Problems to be solved by the invention]

As moving means within a predetermined site in an amusement park, a theme park or the like, there is a vehicle, such as a shuttle bus, traveling along a specific route but there was not a service for providing visitors with a vehicle which is freely moving within a large site like a taxi.

[Description of the embodiments]

A plurality of unmanned autonomous vehicles are disposed in a state in which the unmanned autonomous vehicles can freely travel within a predetermined site. A plurality of unmanned autonomous vehicles, a vehicle allocation server, and a portable terminal can communicate with each other through the network. A user accesses the vehicle allocation server from their portable terminal in the site, thereby enabling an unmanned autonomous vehicle to move to the desired vehicle allocation position. The vehicle allocation server which has received the vehicle allocation request issues an instruction to the specific unmanned autonomous vehicle to travel toward
the vehicle allocation position through the network. After arriving at the vehicle allocation position through the autonomous driving, the unmanned autonomous vehicle urges the user to get on the unmanned autonomous vehicle. Accordingly, the user can move to the destination within the site in a sense of using a taxi.

[Conclusion (EPO)]

Claim 1, being a system claim, fulfils the requirements of EPC Article 52(2) and (3) and is therefore an invention.

Method claim 2 also fulfils the requirements of EPC Article 52(2) and (3) and is therefore an invention.

[Explanation (EPO)]

According to current EPO practice, all system claims are considered inventions in the sense of EPC Article 52(2) and (3).

According to current EPO practice, method claims are considered inventions in the sense of EPC Article 52(2) and (3) if they involve technical means, which claim 2 clearly does.

The claim defines that the input to the vehicle allocation server is a vehicle allocation position specified by a person who desires a vehicle allocation (called requester in the following). Using the position specified by the requester, a vehicle is allocated. However, a mere allocation (i.e. vehicle X is allocated to requester Y) is of an abstract, and thus non-technical, nature and does not produce a technical effect beyond the mere fact of being computer-implemented. Indeed, such an allocation can be thought of as being merely an internal state of the server that has no further technical consequence if left unused.

Having regard to the description and the Figure, what appears to be missing in the claim is an allocated vehicle adapted to drive autonomously to the requested position. If that feature were included in the claim, the resulting technical effect would be, defined by the claim in very broad terms, to provide a vehicle to the requester at a requested location. In addition, it is
noted that the system claim is defined in terms of method steps, rather than structural features. In order to avoid objections under EPC Article 84, formulations such as “the vehicle allocation server is adapted to receive” should be used instead of “the vehicle allocation server receives”.

For this reason, and for the time being, no final conclusion can be reached as to which features will be taken into consideration when comparing with the prior art.

However, if the claim is left unamended, it can be said that the constituent parts of the system (i.e. server, portable terminal, unmanned vehicle) and the functionality of sending and receiving requests between the server and the portable terminal are all considered technical.

For the question, which features of claim 2 are technical (i.e. solve a technical problem), similar considerations apply as the considerations for the system claim 1 above.

[Conclusion (JPO)]

The invention of claim 1 does not fall under "invention."

The invention of claim 2 does not fall under "invention."

[Explanation (JPO)]

The invention of claim 1 and 2 recites "unmanned autonomous vehicles." However, the invention of claim 1 and 2 does not recite either the control of the unmanned autonomous vehicles nor the information processing performed by the unmanned autonomous vehicles at all. Therefore, the invention of claim 1 and 2 does not fall under neither of (a) those concretely performing control of an apparatus or processing with respect to the control or (b) those concretely performing information processing based on the technical properties such as physical, chemical, biological or electric properties of an object described in "Part III Chapter 1 Eligibility for Patent and Industrial Applicability 2.2 (2)".

Then, it is determined "whether or not information processing by software is specifically implemented by using hardware resources". Claim 1 and 2 specifies that a system comprising a vehicle allocation server, a portable terminal, and an unmanned autonomous vehicle is used. However, it is specified merely "when the vehicle allocation server receives a vehicle
allocation request for the unmanned autonomous vehicle for which a vehicle allocation position is specified from the person who desires the vehicle allocation, the vehicle allocation server allocates unmanned autonomous vehicle to the person who desires the vehicle allocation" and no information processing is specified. Therefore, it is not possible to determine that specific calculation or processing of information depending on the intended use which is an allocation of unmanned autonomous vehicles, is specified. For this reason, in the invention of claim 1 and 2, a specific information processing system or an operation method thereof depending on intended use is not constructed through cooperation of software and hardware resources.

Therefore, since the information processing by software is not specifically implemented by using hardware resources, the invention of claim 1 and 2 is not a creation of the technical idea utilizing a law of nature, and thus does not fall under "invention".
3. Case A-3

(From JPHB, Annex B, Chap. 1, 3.2, Case 2-11)

Title of Invention

Tree-Structured Area Management Data, Contents Data Distribution Method and Contents Data Method of Allocating

What is claimed is:
[Claim 1]
Tree-structured area management data comprising in the order of single-layer root node, multi-layer intermediate nodes and single-layer leaf nodes from top, wherein:

the said leaf nodes have location information on distribution areas and contents data;

among the said intermediate nodes, those equipped with the said plurality of leaf nodes underneath have pointers to the said plurality of leaf nodes underneath and location information having a minimum bounding rectangle that bounds the said plurality of distribution areas corresponding to the plurality of leaf nodes underneath with the minimum area;

among the said intermediate nodes, those equipped with a plurality of intermediate nodes underneath have pointers to the said plurality of intermediate nodes underneath and location information of the minimum bounding rectangle that bounds the said minimum bounding rectangles owned by the plurality of intermediate nodes underneath with the minimum area;

the said root node has pointers to the said plurality of intermediate nodes underneath;

wherein the tree-structured area management data is stored in a contents distribution server; and

it is used by the said contents distribution server to perform processing to identify leaf nodes corresponding to distribution areas that geographically bound current location information input as a search key in accordance with the pointers owned by root node or intermediate nodes.

[Claim 2]
A contents data distribution method wherein:

a contents distribution server that stored the tree-structured area
management data described in Claim 1

acquires current location information as a search key;

identifies intermediate nodes corresponding to the minimum bounding rectangle that geographically contain the said current location information by comparing location information of the minimum bounding rectangle owned by the said plurality of intermediate nodes underneath the said root nodes with the said current location information;

repeats a comparison of location information of the minimum bounding rectangle owned by the said plurality of subordinate intermediate nodes of the said identified intermediate nodes or location information of the said distribution areas owned by the said plurality of leaf nodes with the said current location information until leaf nodes corresponding to distribution areas that geographically contain the said current location information are identified; and

distributes contents data owned by the said identified leaf nodes to users.

[Claim 3]

The contents data distribution method described in Claim 2 wherein the said contents data relates to data on items or characters used on gaming applications that run on gaming machines of users.

[Claim 4]

The contents data distributed to users by means of the method described in Claim 3.
Drawing
[Fig. 1]
[Fig.4]

1. Processing for distributing content data
2. Acquisition of current location of user
3. Reference to intermediate nodes underneath root nodes
4. Location information owned by intermediate nodes is compared with current location
5. Is there any intermediate node corresponding to the minimum bounding rectangle that contains current location?
   - NO
   - YES
6. Reference to a subordinate node of the intermediate node
7. Location information owned by the leaf node is compared with current location
8. Is there any leaf node corresponding to the range that contains current location?
   - NO
   - YES
9. Contents data owned by the leaf node is distributed to the user
   - Completion
Overview of the description

[Technical Field]

The present invention relates to a data structure for a technology to distribute contents data to users.

[Background Art]

As described in Fig.1, there is a service for users who own gaming machines that run on specific gaming applications within specific distribution areas on a map to distribute contents data on gaming related to the distribution areas to their gaming machines. In this service, if a user is found to be in a specific distribution area while he/she is in transit, contents data related to the distribution area is automatically distributed to their gaming machine. Moreover, it is envisaged that the user physically moves to a specific distribution area where he/she may receive desired contents data in order to acquire it.

[Problems to be solved by the invention]

However, in order to increase a game element of those applications, it is necessary to set an enormous number of distribution areas. In the conventional techniques, it was required to compare location information on all distribution areas and current location of users so as to identify distribution areas that geographically contain current location of users. This required large computing burden.

[Solution for the Problem to be solved]

(Omitted)

[Description of the embodiments]

The contents distribution server acquires current location information of users from their gaming machines as a search key, identifies distribution areas that geographically contain the current location information, and distributes contents data corresponding to the identified distribution areas to users. The gaming machines are equipped with the communication function and current location acquisition function. Contents data includes those related to items and characters used on gaming applications that run on those gaming machines. The contents distribution server manages distribution areas and contents data in a way that they are included in tree-structured area management data as described below and stored in a memory part thereof.

(Data Structure of Area Management Data)
Each distribution area defines location information based on information on latitude and longitude \((x_1, y_1) (x_2, y_2)\) in the rectangular diagonal position. A distribution area is bounded by one minimum bounding rectangle together with one or more distribution areas nearby. The minimum bounding rectangle refers to a rectangle that bounds a plurality of distribution areas with the minimum area and defines location information based on information on latitude and longitude in the rectangular diagonal position in the same manner as distribution areas. A minimum bounding rectangle is bounded by a superordinate minimum bounding rectangle together with one or more minimum bounding rectangles nearby. In this way, a tree-structure composed of a plurality of distribution areas and minimum bounding rectangles is formed.

A root node is in the uppermost position of data structure. Nodes corresponding to minimum bounding rectangles are called intermediate nodes, while those corresponding to distribution areas are called leaf nodes. A root node has pointers to a plurality of intermediate nodes underneath. Each intermediate node has location information on a corresponding minimum bounding rectangle and a pointer to a plurality of subordinate intermediate nodes or leaf nodes. Each leaf node has location information on corresponding distribution areas and contents data.

Fig. 2 is an illustrative example of distribution areas and minimum bounding rectangles. The distribution areas A - C are bounded by the minimum bounding rectangle I and the distributions areas D - F by the minimum bounding rectangle II.

Fig. 3 represents a structure of area management data formed in the case of Fig. 2. The intermediate node corresponding to the minimum bounding rectangle I has pointers to the leaf nodes corresponding to the distribution areas A - C, while that corresponding to the minimum bounding rectangle II has the leaf nodes corresponding to the distribution areas D - F. The uppermost root node has pointers to each of the intermediate nodes. Contents data is associated with each of the leaf nodes.

(Processing for Contents Data Distribution)

Fig. 4 is used to explain processing for distributing contents data performed by the contents distribution server. Once the server acquires current location information of a user from their gaming machine as a search key (S1), it refers to the intermediate nodes underneath the root node (S2)
and compares location information owned by the intermediate nodes with current location information (S3). Based on this comparison, it is determined whether or not there is any node corresponding to the minimum bounding rectangle that geographically contains current location information (S4), and if that is the case, subordinate nodes of the intermediate nodes are referred to (S5). If there is no such node, it is determined that there are no users in any of the distribution areas, and the processing completes and processing for distributing contents data is not performed. Then, whether or not the subordinate nodes of the intermediate nodes are leaf nodes is determined (S6). If they are not leaf nodes, that is, if they are intermediate nodes, the process returns to (S3) and the procedures of (S3) - (S5) are repeated until those nodes reach a leaf node. If they are found to be leaf nodes, location information on distribution areas owned by the leaf nodes and current location information are compared (S7) to determine whether or not there is any leaf node corresponding to distribution areas that geographically contain current location information (S8). If there is such a leaf node, contents data owned thereby is distributed to users (S9). On the other hand, if there is no such leaf node, it is determined that there are no users in any of the distribution areas, and the processing completes and processing for distributing contents data is not performed.

Specific processing for distributing contents data is shown using the examples in Figs. 2 and 3. In these examples, a user exists in the distribution area C. By repeating process of comparing location information on distribution areas owned by the root node and intermediate nodes with current location information, it is determined that current location information is contained geographically in the minimum bounding rectangle I. Then, location information on the distribution areas A - C owned by a subordinate leaf node of the intermediate node corresponding to the minimum bounding rectangle I is compared with current location information to determine whether or not it is contained geographically in the distribution area C. Therefore, contents data owned by the leaf node corresponding to the distribution area C is distributed to users.

As discussed here, the management of distribution areas with tree-structure only requires the processing of comparison for the number of stages of the tree-structure in order to identify distribution areas that geographically contain current location information of users that was input
as search keys. As a result, this method may identify distribution areas at higher speed compared to the conventional technique of comparing location information on all distribution areas with current location of users.

**[Conclusion (EPO)]**

Claim 1 is an invention in the sense of EPC Article 52(2) and (3), since it defines physically embodied data including the data structure.

Claim 2 is also an invention in the sense of EPC Article 52(2) and (3), since it defines a computer-implemented method.

Claim 3 is dependent on claim 2 and belongs to the same category, therefore it is an invention in the sense of EPC Article 52(2) and (3).

Claim 4 is a claim to data as such and thus does not constitute an invention in the sense of EPC Article 52(2) and (3).

**[Explanation (EPO)]**

- **Claim 1**

  At the EPO, the patentability of computer data structures is examined according to EPGL, Part G, Chap. II, 3.7 and 3.7.2. These sections of EPGL reflect pertinent case law of the EPO Boards of Appeal.

  However, considering claim 1 as a whole, it is evident that claim 1 essentially refers to a data structure.

  According to EPGL, Part G, Chap. II, 3.7.2, a computer-implemented data structure embodied on a medium has technical character. In this example, the claim defines tree-structured area management data, including its structure, and further comprises a limitation to the fact that the data is stored in a contents distribution server. The subject-matter defined by claim 1 is thus an invention in the sense of EPC Article 52(2) and (3). However, independent from the above, the question arises whether the data defined by claim is suitable for making a contribution towards an inventive step. Such a contribution can only be acknowledged, if the data is functional data. Board of Appeal decision T 1194/97, for example, held that functional data includes a data structure defined in terms which inherently comprise the technical features of the system in which the medium storing the data is operative.

- **Claim 2**
Claim 2 is drafted as a method of data storage and retrieval, involving technical means and the data structure defined by claim 1. Those features of claim 2 referring to the structure of the data are considered technical. Those features referring to the content (i.e. meaning) of the data are considered non-technical.

- Claim 3
  Analogous considerations apply to claim 3, dependent on claim 2.

- Claim 4
  At the EPO, the patentability of computer data structures is examined according to EPGL, Part G, Chap. II, 3.7 and 3.7.2. These sections of EPGL reflect pertinent case law of the EPO Boards of Appeal.
  Independent from the above, it can be argued that the data claimed constitute presentation of information as such (the nature of the claimed data does not change by specifying that it has been distributed in a certain manner). The meaning of the data claimed is thus irrelevant, reinforcing the “presentation of information” argument.

[Conclusion (JPO)]
  The inventions of claim 1-3 fall under "invention."
  The invention of claim 4 does not fall under "invention."

[Explanation (JPO)]
- Claim 1
  The area management data of Claim 1 is data having a structure capable of identifying distribution areas that geographically contain current location information input as a search key by means of information processing in accordance with pointers owned by root nodes and intermediate nodes. Thus, the "structured data" has characteristics similar to the computer program in that a structure the data has specifies information processing by computer so that this structured data is determined to be equivalent to the computer program.
  Moreover, it is determined, from the statement of Claim 1, that computing or processing of specific information in accordance with its
purpose of use, that is, the identification of distribution areas including current location input as a search key, is realized by specific means or specific procedures, that is, a series of information processing by the contents distribution server that stores area management data by means of the collaboration between the software ("structured data" equivalent to the computer program) and hardware resources. The "structured data" is thus determined to establish an operating method of a specific information processing device in accordance with the purpose of use by means of the collaboration between the software and hardware resources.

Therefore, as information processing specific by the "structured data" equivalent to the computer program is realized specifically using hardware resources, the area management data of Claim 1 is a creation of the technical idea utilizing a law of nature and thus falls under "invention".

- Claim 2

It is determined, from the description of Claim 2, that computing or processing of specific information in accordance with its purpose of use, that is, the distribution of contents data in accordance with current location input as a search key, is realized by specific procedures, that is, a series of information processing by the contents distribution server that stores area management data, by means of the collaboration between the software and hardware resources. The method of Claim 2 is thus determined to establish an operating method of a specific information processing device in accordance with the purpose of use by means of the collaboration between the software and hardware resources.

Therefore, as information processing by the computer program is realized specifically using hardware resources, the method of Claim 2 is a creation of the technical idea utilizing a law of nature and thus falls under "invention".

- Claim 3

Since Claim 3 cites Claim 2, it is determined, from the description of Claim 3, that computing or processing of specific information in accordance with its purpose of use, that is, the distribution of contents data in accordance with current location input as a search key, is realized by specific procedures, that is, a series of information processing by the contents distribution server that stores area management data by means of the
collaboration between the software and hardware resources in the same manner as the determination made in Claim 2. The method of Claim 3 is thus determined to establish an operating method of a specific information processing device in accordance with the purpose of use by means of the collaboration between the software and hardware resources.

Therefore, as information processing by the computer program is realized specifically using hardware resources, the method of Claim 3 is a creation of the technical idea utilizing a law of nature and thus falls under "invention".

- Claim 4

Mere presentation of information (where the feature resides solely in the content of the information, and the main object is to present information), such as presentation of information (presentation per se, means for presentation or method of presentation) in which a technical feature does not reside, does not fall under "invention" ("creation of the technical idea utilizing a law of nature") mentioned in the main paragraph of JPA Article 29(1).

The contents data of Claim 4 relates to data on items or characters used on gaming applications that run on gaming machines of users. The only thing identified is that such data is distributed from the contents distribution server to users. The distribution processing and the distribution method do not have any technical features. Therefore, the contents data of Claim 4 does not have technical features in the presentation of information (presentation per se, means for presentation or method of presentation), its feature resides solely in the content of the information that "it is data on items or characters used on gaming applications that run on gaming machines of users", and its main object is to present information. Moreover, since the contents data is owned only by the leaf nodes of area management data and its structure does not specify any information processing by computers, it does not fall under "structured data" equivalent to the computer program either.

Therefore, since the contents data of Claim 4 is mere presentation of information, it is not a creation of the technical idea utilizing a law of nature as a whole and thus does not fall under "invention".
4. Case A-4

(From JPHB, Annex B, Chap. 1, 3.2, Case 2-14)

Title of Invention

Trained Model for Analyzing Reputations of Accommodations

What is claimed is:

[Claim 1]

A trained model for causing a computer to function to output quantified values of reputations of accommodations based on text data on reputations of accommodations, wherein;

the model is comprised of a first neural network and a second neural network connected in a way that the said second neural network receives output from the said first neural network;

the said first neural network is comprised of an input layer to intermediate layers of a feature extraction neural network in which the number of neurons of at least one intermediate layer is smaller than the number of neurons of the input layer, the number of neurons of the input layer and the number of the output layer are the same, and weights were trained in a way each value input to the input layer and each corresponding value output from output layer become equal;

weights of the said second neural network were trained without changing the weights of the said first neural network; and

the model causes the computer function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network.

[Claim 2]

A computer program for causing a computer to function to output quantified values of reputations of accommodations based on text data on reputations of accommodations, wherein:

the program is comprised of a first neural network and a second neural
network connected in a way that the said second neural network receives output from the said first neural network:

the said first neural network is comprised of an input layer to intermediate layers of a feature extraction neural network in which the number of neurons of at least one intermediate layer is smaller than the number of neurons of the input layer, the number of neurons of the input layer and the number of the output layer are the same, and weights were trained in a way each value input to the input layer and each corresponding value output from output layer become equal:

weights of the said second neural network were trained without changing the weights of the said first neural network; and

the program causes the computer function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network.

[Claim 3]

A computer-readable storage medium having stored thereon the computer program as described in claim 2.
Overview of the description

(Note) Description is written on the premise of Claim 1. For Claim 2 and 3, please read the description on the assumption that a "trained model" is replaced with a "computer program". For Claim 3, please also assume that the description discloses a computer-readable storage medium having stored thereon the "computer program".

[Background Art]

A neural network, which has a computer function as a computing unit to calculate output in response to certain input, is capable of performing complicated information processing at high speed by being trained from a
number of actual examples. Therefore, people intend to use neural networks for various purposes in such fields as image recognition, voice recognition, voice synthesis and automated translation.

Generally, in cases where neural networks are utilized in new areas, in many cases it is not clear what should be input as the input feature values, therefore, it is necessary to carefully review what should be selected as the input feature values accordingly.

In order to analyze text data on reputations of accommodations such as hotels posted on travel review sites with neural networks, it is not straightforward to select the input feature values, because the appearance frequencies of a variety of words ("Like", "!"., etc.) included in the text data can be considered as the candidate input feature values.

[Problems to be solved by the invention]

The present invention has been conceived in view of the above problems into consideration and aims to accurately analyze reputations of accommodations even if the input feature values are not properly pre-selected.

[Solution for the Problem to be solved]

The trained model of the present invention aims to cause a computer to function to output quantified values of reputations of accommodations based on text data on reputations of accommodations and is comprised of a first neural network and a second neural network connected in a way that the second neural network receives output from the first neural network. The trained model is supposed to be utilized as a program module which constitutes a part of artificial intelligence software.

The trained model of the present invention is utilized in a computer equipped with a CPU and a memory. Specifically, the CPU of the computer operates, in accordance with instructions from the trained model stored in the memory, in a way that it performs a calculation based on trained weights and response functions in the first and second neural networks in response to data input to input layers of the first neural network (appearance frequency of specific words obtained from text data of reputations of accommodations, e.g. by performing morphological analyses) and outputs results from output layers of the second neural network (quantified values of reputations, e.g. "10 stars").

The first neural network is comprised of an input layer to
intermediate layers of a feature extraction neural network. This feature extraction neural network is generally called autoencoder. In this network, the number of neurons in the intermediate layers is smaller than the number of neurons in the input layer. The number of neurons in the input layer and the number of neurons in the output layers are set to be equal. Moreover, a response function of each of the neurons in the input and output layers is a linear function, and other response functions of each of the neurons are sigmoid functions \( \frac{1}{1+\exp(-x)} \).

The feature extraction neural network is trained by means of a well-known art called back propagation method and weights between neurons are updated. In the embodiment of present invention, this neural network is trained to minimize mean square errors for overall input data so that data (each appearance frequency of a plurality of words obtained from text data on reputations of accommodations by performing morphological analyses) is input in the input layers and data the same as this input data is output from the output layers. Since sigmoid functions which are non-linear functions are utilized as neuron's response functions as explained earlier, the weights between neurons are not symmetrical across the intermediate layer. As the feature extraction neural network is trained, the intermediate layer become possible to obtain the feature values indicating characteristics of each input data. Although the feature values that appear in the intermediate layer do not necessarily have clear physical implication, those feature values are considered as what were compressed to the extent that information input to the input layer can be restored to information output from the output layer and the feature values that appear in the intermediate layer become almost similar regardless of the input feature values to the input layer. Therefore, it is not necessary to properly preselect the input feature values to the input layer any more.

In the present invention, the part from the input layer to the intermediate layers in the feature extraction neural network in which weights were trained is connected to the second neural network as the first neural network. Weights of the second neural network are trained without changing weights of the said first neural network. The training is performed by a well-known art called a back propagation method as explained earlier.

Since the trained model of the present invention is comprised of the above first and second neural networks, it can accurately analyze
reputations of accommodations without presetting the feature values.

[Conclusion (EPO)]

Claim 1 defines a model that comprises trained neural network and which causes a computer to perform a calculation. It is unclear, however, how a model, which is of an abstract nature and unlike a computer program does not comprise instructions that a computer can carry out, causes the computer to carry out said calculation. Is it necessary, for example, to convert the model into a computer program in order to cause the computer to perform said calculation? It thus seems unclear whether the claim merely defines an abstract method that could be used by a computer if it was programmed accordingly. Consequently, it seems that claim 1 does not define an invention in the sense of EPC Article 52(2) and (3).

Claim 2, on the other hand, defines a computer program. Here, the question to be answered is whether the subject-matter of claim 1 produces a further technical effect, i.e. whether it solves a technical problem, as contrasted to a commercial, administrative, financial one (and the like), which goes beyond the "normal" physical interactions between the program (software) and the computer (hardware) on which it is run. The problem solved by the computer program of claim 1 is, according to the claim, the categorization of reputations of accommodations, which is clearly a commercial problem.

Therefore, the subject-matter of claim 1 lacks the requisite further technical effect, and does not constitute an invention in the sense of EPC Article 52(2) and (3).

However, if the claim referred to a technical problem to be solved (as contrasted to the present commercial problem), then claim 1 would probably constitute an invention in the sense of EPC Article 52(2) and (3).

Similar considerations apply to claim 2.

The computer-readable storage medium of claim 3 is normally a device, and therefore it constitutes an invention according to EPC Article 52(2) and (3).
[Explanation (EPO)]

- Claim 1
  Regarding claim 1, it can be of course argued that the claim goes beyond the mere commercial effect, in that it defines the structure and function of the corresponding neural network, as well as a categorization process. If the categorization were an element of a technical process (e.g. pattern recognition of handwriting), then the claim might be considered an invention in the sense of EPC Article 52 (2) and (3). In this case, all features referring to the structure and function of the neural network (e.g. layer structure, transfer function etc.) would be considered technical.

- Claim 2
  Similar considerations apply to claim 2.

- Claim 3
  Regarding claim 3, according to current EPO practice, the technical characteristics of the storage medium itself are not affected by the program stored thereon. Therefore, the computer-readable storage medium is, from an inventive step viewpoint, equivalent to a computer-readable storage medium with any program stored thereon.

    As general remark, not necessarily referring to the present case, it is stated that the EPO has duly considered clarity requirements regarding the definition of neural networks as well. The above referred features (layer structure, transfer function of the neurons, and any other feature necessary for the neural network to develop its functionality) are considered essential features of a neural network and therefore should be defined in the claim for compliance with the clarity requirements of Art. 84 EPC.

[Conclusion (JPO)]

  The inventions of claim 1 falls under "invention."
  The inventions of claim 2 falls under "invention."
  The inventions of claim 3 falls under "invention."

[Explanation (JPO)]
- Claim 1

The trained model of Claim 1 is what "causes a computer to function to output quantified values of reputations of accommodations based on to text data on reputations of accommodations" as well as to what "causes the computer function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network." Moreover, considering the descriptions which states that "the trained model is supposed to be utilized as a program module which constitutes a part of artificial intelligence software" and "the CPU of the computer operates, in accordance with instructions from the trained model stored in the memory, in a way that it performs a calculation based on trained weights and response functions in the first and second neural networks in response to data input to input layers of the first neural network (appearance frequency of specific words obtained from text data of reputations of accommodations, e.g. by performing morphological analyses) and outputs results from output layers of the second neural network (quantified values of reputations, e.g. "10 stars"), it is clear that the trained model of Claim 1 is a "program" even though the claimed subject matter of Claim 1 is described as a "model."

Moreover, it is determined, from the statement of Claim 1, that specific calculation or processing of specific information depending on the intended use which is accurate analysis of reputations of accommodations, is implemented by specific means or specific procedures on which software and hardware resources cooperate, which is for a computer to "function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network." For this reason, in the trained model of Claim 1, a specific information processing system depending on intended use is constructed through cooperation of software and hardware resources.

Therefore, since the information processing by software is specifically
implemented by using hardware resources, the trained model of Claim 1 is a creation of the technical idea utilizing a law of nature and thus falls under "invention".

- Claim 2

It is determined, from the statement of Claim 2, that specific calculation or processing of specific information depending on the intended use which is accurate analysis of reputations of accommodations, is implemented by specific means or specific procedures on which software and hardware resources cooperate, which is for a computer to "function to perform a calculation based on the said trained weights in the said first and second neural networks in response to appearance frequency of specific words obtained from the text data on reputations of accommodations input to the input layer of the said first neural network and to output the quantified values of reputations of accommodations from the output layer of the said second neural network." For this reason, in the computer program of Claim 2, a specific information processing system depending on intended use is constructed through cooperation of software and hardware resources.

Therefore, since the information processing by software is specifically implemented by using hardware resources, the computer program of Claim 2 is a creation of the technical idea utilizing a law of nature and thus falls under "invention".

- Claim 3

The same reasons are applied as Claim 2.
## B. Novelty

### 1. Case B-1

(From JPHB, Annex A, 4. Case 35)

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**What is claimed is:**

**[Claim 1]**

A robot apparatus which acts on an object comprising:

- at least one kind of sensor for detecting the object;
- a transmission section for transmitting a query to a server in order to acquire information on the object based on an output of the sensor;
- a reception section for receiving response information answering the query from the server; and
- a control section storing a program which controls the operation of the robot apparatus on the basis of the received response information;

wherein the response information is the information on a type of the said object specified by the said server on the basis of information received via a network from a production facility of the said object.

**[Claim 2]**

A robot apparatus which acts on an object comprising:

- at least one kind of sensor for detecting the object;
- a transmission section for transmitting a query to a server in order to acquire information on the object based on an output of the sensor;
- a reception section for receiving response information answering the query from the server; and
- a control section storing a program which controls the operation of the robot apparatus on the basis of the received response information;

wherein the response information is the information on a type of the said object specified by the said server.
A robot apparatus which acts on an object comprising:
at least one kind of sensor for detecting the object;
a transmission section for transmitting a query to a server in order to acquire information on the object based on an output of the sensor;
a reception section for receiving response information answering the query from the server; and
a control section storing a program which controls the operation of the robot apparatus on the basis of the received response information:
wherein the response information contains the attribute information and the unique identification information of each of the said object specified by the said server.
Drawing in the present application

Drawing in the prior art

Claim 1
- Information on type of object specified on the basis of information received via a network from a production facility of the object

Claim 2
- Attribute information of each object (e.g., materials, weight, surface treatment condition of each product)
- Unique identification information (e.g., ID number of each product)
Overview of the description
Solution for the Problem to be Solved

The invention as claimed in claim 1 is directed to a robot apparatus capable of accurately determining a type of a product as an object to be handled, on the basis of the latest information acquired from a production facility of the product, thereby achieving appropriate handling of the product.

The invention as claimed in claim 2 is directed to a robot apparatus capable of achieving appropriate handling of individual products and reporting of information acquired as to the products, even when each of the products as an object to be handled has a different specification.

Embodiment 1

In an embodiment of the invention according to claim 1, the robot apparatus performs work such as transferring, at an assembly plant like an automobile manufacturing factory, various types of products delivered as assembly parts from a number of parts manufacturing companies. The robot apparatus has a gripping unit for grasping a product and an image sensor capable of obtaining images of the product.

In the robot apparatus, the image sensor detects, as image information, such information as the shape of a product being handled by the robot apparatus, a company name indicated on the product, a serial number assigned to each product according to a system prescribed for each type of products. A transmission section sends a query for acquiring information on a type of product to a server based on an output of the image sensor. The query contains image information.

When the server receives the query from the robot apparatus, it compares the image information of the query with information stored in a storage device of the server to determine a type of object. Then, the server sends the information on the type of object, e.g., a front seat for a medium-sized car, to the robot apparatus as a response. The robot apparatus controls the operation of a gripping unit, etc. on the basis of the response information.
such information as the shape of a product being handled by the robot apparatus, a company name indicated on the product, a serial number assigned to each product according to a system prescribed for each type of products. The transmission section sends a query for acquiring information on a type of product to a server based on an output of the image sensor. The query contains image information.

The server is connected via a network to a computer system of a production facility of each product manufacturing company and stores the latest information on products. When the server receives the query from the robot apparatus, it analyzes the image information to specify a type of product and sends the information back to the robot apparatus as response information.

In the robot apparatus, a reception section receives the response information, and a program of a control section controls the operation of the robot apparatus on the basis of the response information.

In the present embodiment, the robot apparatus performs operation control on the basis of the information that the server received from the production facility of the product via a network. Therefore, the robot apparatus can accurately determine a type of product on the basis of the
latest information. This contributes to appropriate handling of the product.

Embodiment 2

In an embodiment of the invention according to claim 2, a robot apparatus has a gripping unit, an image sensor, and a transmission section, similar to the Embodiment 1.

In the present embodiment, the transmission section sends a server a query for identifying an individual product and acquiring relevant information based on an output of the image sensor.

The server is connected to a computer system of a production facility of each product manufacturing company via a network, and stores information on product lines in a systematically organized and continuously updated manner. When the server receives a query from the robot apparatus, it analyzes image information to identify each individual product, and sends attribute information, such as materials used, weight, and surface treatment condition of each one of the products, and unique identification information (e.g., ID number uniquely and systematically assigned to each one of all the products to be handled) to the robot apparatus as response information.

In the robot apparatus, a
reception section receives the response information, and a program of a control unit controls the operation of the robot apparatus on the basis of the response information.

In this embodiment, the robot apparatus receives response information containing the attribute information, such as materials, weight, surface treatment condition, and the unique identification information of each individual product and, on the basis of the information, controls its own operation. This enables appropriate handling, etc. of each product. More specifically, this enables a control of the gripping unit in such a manner that the gripped portion of the product and the gripping force can be optimized to each individual product. Information (e.g., rigidity of the gripped portion) acquired by the control section of the robot apparatus when the gripping unit grips the product can be sent from the transmission section to the server with the unique identification information. This enables the robot apparatus to perform the feedback of such information to the server and the addition and updating of the attribute information of the product. Thus, the added or updated attribute information may be used for the next gripping of the same product, or shared with the other robot apparatus connected to the
server. For the sake of the subsequent handling of the product in the assembly factory, the robot apparatus can affix to the product a seal showing a printed identification symbol or number, or attach an ID tag to the product, on the basis of the unique identification information. Furthermore, in a case where the robot apparatus detects abnormality such as damage of the product, the robot apparatus can also report it to the server with the unique identification information.

[Conclusion (EPO)]

Claim 1 lacks novelty. However, this objection is easily overcome as indicated in the explanation.

Claim 2 is novel.

[Explanation (EPO)]

- Claim 1

Claim 1 appears to differ from the prior art in that it further specifies that the received response information, which is received from a server, is (determined) “on the basis of information received via a network from a production facility of the said object”. However, since the claim defines a robot apparatus that merely communicates, via a transmission section and a reception section, with a server, neither the server nor the network or the production facility seem to be part of the claimed subject-matter. Hence, any claim limitation which does not limit the robot apparatus, but some other unclaimed device, cannot result in a novel claim. Hence, claim 1 lacks novelty.

However, if, for example, the routing of information between server and production facility were part of the claimed subject-matter, and this was clarified by way of amendment, then claim 1, which is not directed to a
system comprising a robot, a server and a production facility but directed to a robot, would be novel, because the prior art does not disclose such routing of information.

- Claim 2

Similar considerations apply to system claim 2. However, claim 2 differs from claim 1 in that the response information is attribute information and a unique identification of the object. Therefore, claim 2 is clearly novel.

[Conclusion (JPO)]
The invention of claim 1 lacks novelty.
The invention of claim 2 has novelty.

[Explanation (JPO)]
- Claim 1

The robot apparatus is a sub-combination, which is a part of a combination of the robot apparatus and the server.

Claim 1 on the robot apparatus recites a feature related to the server (the other sub-combination), namely, "the response information is the information on a type of the said object specified by the said server on the basis of information received via a network from a production facility of the said object". The portion of "on the basis of information received via a network from a production facility of the said object" only describes the source from which the server, separate from the robot apparatus, obtains information for specifying response information. This does not make any difference in the program itself of the robot apparatus, and does not serve to specify a structure, a function, etc. of the robot apparatus.

Consequently, there is no difference between the invention according to claim 1 and the invention disclosed in the cited document. As a result, the invention according to claim 1 lacks novelty.

- Claim 2

Similarly, claim 2 on a robot apparatus recites a feature related to the server (the other sub-combination), namely, "the response information contains the attribute information and the unique identification information..."
of each of the said object specified by the said server”. With respect to the
response information, claim 2 also specifies that the robot apparatus has "a
control section storing a program which controls the operation of the robot
apparatus on the basis of the received response information". Therefore, the
robot apparatus according to claim 2 has a control section storing a program
which controls the operation of the robot apparatus on the basis of the
attribute information and the unique identification information of each of
the object, and performs the operation, through the control section, in
response to the attribute information and the unique identification
information of each of the object.

In contrast, according to disclosure in the cited document, "the response
information is the information on a type of the said object specified by the
said server." Therefore, the robot apparatus only has a control section with a
program which controls the operation of the robot apparatus on the basis of
the information on a type of the said object, vis-à-vis the response
information, and does not perform operation in response to the attribute
information and the unique identification information of each of the object.

Accordingly, there is a difference between the invention according to
claim 2 and the invention disclosed in the cited document. As a result, the
invention according to claim 2 has novelty.
C. Inventive step

1. Case C-1

(From JPHB, Annex A, 5. Case 26)

Title of invention
Supply Chain Management Method

[Claim 1]
A computer implemented method for managing a supply chain, comprising the steps of:

- receiving a demand for a product;
- selecting at least one first source(s) to satisfy the said demand, based on information including operation status data at a plurality of sources of the said product, and generating a provisional reservation for a supply from the selected source(s);
- determining whether there is a need for a requisition for any component part or material of the said product for the first source(s) to implement the said reservation;
- selecting, where it is determined that there is a need for the said requisition, at least one second source(s), from among a plurality of sources of the component part or material, to satisfy the requisition as a demand, based on information including operation status data at the sources, and generating a provisional reservation for a supply from the selected source(s);
- and
- updating the provisional reservations generated so far to confirmed reservations where, for each component part or material of the said product, it has been determined that the requisition is not necessary or the provisional reservation has been generated.
Overview of the description

[Problem to be Solved by the Invention]

The present invention addresses the problem, in relation to the supply chain management, of determining whether there is a need for a requisition for any component part or material of a product, and generating automatically by a computer a provisional reservation and a confirmed reservation in response to, inter alia, operational status at a supply source, where the requisition is necessary.

[Solution for the Problem to be solved]

The method of the present invention selects at least one first source(s) to satisfy a demand for a product in a supply chain, based on information including operation status data at a plurality of sources of the product. The operation status data may include real-time data at a
production facility of a supplier (as a supply source) such as machine tool
operation data and the amount of works waiting for processing, and the
operation status data are utilized through communication via a network
such as the Internet. Analysis of the operation status data enables the
selection of supply source(s) to reflect properly the supply capacity of each
source moment by moment. Upon selection of at least one first source(s) to
satisfy the demand, the method generates, at this stage, "provisional
reservation(s)" for supply from the selected source(s).

Next, the method determines whether there is a need for a
requisition for any component part or material of the product. Where it is
determined that there is a need for the requisition, at least one second
source(s) is/are selected, from among a plurality of sources of the component
part or material, to satisfy the requisition as a demand, based on information
including operation status data. Such a process is reiterated as necessary.
Where, as a result, for each component part or material of the said product, it
has been determined that the requisition is not necessary or otherwise the
provisional reservation has been generated, the provisional reservations
generated so far will be updated to confirmed reservations.

Accordingly, the method of the present invention is able to generate
promptly provisional reservation(s) even in the case of a complicated supply
chain with a number of tiers, and to find the status of insufficient supply in
the supply chain, based on the existence of remaining provisional
reservation(s) without being updated to confirmed reservation(s), if any.

[State of the art (Prior art, well-known art, etc.)]
Cited invention 1 (Invention disclosed in the cited document 1 (D1)):

A computer implemented method for managing the supply and
demand of a product, comprising the steps of:

receiving a demand for a product;

selecting a source to satisfy the said demand, based on information
including operation status data at a plurality of sources of the said product;

determining whether the said demand is satisfied by the supply from
the said source; and

selecting, where it is determined that the demand is not satisfied,
another source to satisfy the unsatisfied demand, from among a plurality of
sources of the said product, based on information including operation status
data at the sources, or

generating, where it is determined that the demand is satisfied, reservations for supply from the sources selected so far.

[CDrawing in D1]

Cited invention 2 (Invention disclosed in the cited document 2 (D2)):

A computer implemented method for assisting the inventory management of parts at a production facility, comprising the steps of:

- receiving a demand for a product;
- identifying component parts necessary for manufacturing the said product;
- determining whether the stock of each component part is sufficient to satisfy the said demand;
- indicating, where it is determined that the stock is insufficient, possible source(s) of the said component part to satisfy the said demand and their supply capacity, based on information including operation status data at a plurality of sources of the said part, or
- indicating, where it is determined that the stock is sufficient, information regarding the said stock.
**Conclusion (EPO)**

Claim 1 lacks an inventive step. However, in this example, such an objection is easily overcome as indicated further below.

**Explanation (EPO)**

Since the claimed subject-matter of this example is a computer-implemented method, it is not excluded from patentability under Art. 52(2) and (3). However, when examining inventive step, at the EPO it must be assessed which features of a claim make a contribution towards an inventive step.

All features of claim 1, apart from the fact of being computer
implemented method steps, relate to a non-technical administrative scheme for managing a supply chain, i.e. a method for doing business. However, the mere fact that subject-matter, which is excluded per se under Article 52(2) EPC, is technically implemented cannot form the basis for inventive step. Inventive step can be based only on the particular manner of implementation of such subject-matter. To this end it is therefore necessary to ask how the per se excluded subject-matter is implemented (see also the catchword of T 0336/07).

However, in this example, the claimed subject-matter does not go beyond a mere implementation of a business method. As such, claim 1 lacks an inventive step.

A lack of inventive step in such a case cannot be overcome by arguing that the claims, interpreted in the light of the description, exclude a mere computer implementation of a business method. This would be tantamount to reading further technical features into the claim, a form of claim construction not allowable under the EPC and its case-law.

Moreover, the present example, may also be regarded as a mere computer-implementation of a mental activity. At the EPO, if a method claim does not exclude a purely mental realisation, it encompasses embodiments falling under the category of methods for performing mental acts as such (Art. 52(2)(c) and (3), see also T 914/02 r.2.3, T 471/05 r.2.2). This applies regardless of whether the claim encompasses also technical embodiments (T 619/02 r.2.2, T 417/05 r.2.2, T 930/05 r.4.5) and of whether the method is based on technical considerations (T 914/02 r.2.3.3, T 471/05 r.2.2, G 3/08 r.13.3). Again, a mere implementation of a mental activity, an activity which is excluded as such, lacks an inventive step.

Hence, in the present case, it is necessary to add further features to the claim that exclude a mere implementation of a business method or a mental act. Having regard to the description, it is possible to limit the claim to a manufacturing supply chain, the type of product being manufactured, and the type of component parts or materials being ordered. As a result of introducing such features, all the claim's method steps will make a
contribution towards an inventive step. Such a claim will be the basis for the application of the problem-solution approach below.

Prior art D1

Claim 1 differs from the disclosure of D1 in that a first provisional reservation is generated and requisition is effected after selection of source 1, as well as a “cascaded” second selection and second provisional reservation is effected from a source 2, for the purpose of finally updating the provisional reservations to confirmed reservations.

D1, in contrast, discloses selection of a second source if the demand cannot be satisfied from the first source, and generating the corresponding reservation.

The technical effect of this difference is a more efficient functioning of a supply chain, in case this chain is a complicated one.

The objective technical problem solved by the difference is how to schedule a more efficient functioning of a complicated supply chain.

Starting from D1, the skilled person, faced with the objective technical problem, does not find any incentive to modify the supply chain disclosed in D1 in the manner claimed.

Prior art D2

Claim 1 differs from the disclosure of D2 in that a first provisional reservation is generated and requisition is effected after selection of source 1, as well as a “cascaded” second selection and second provisional reservation is effected from a source 2, for the purpose of finally updating the provisional reservations to confirmed reservations.

D2, in contrast, discloses determination of stock sufficiency, and indication of possible alternative sources in case of insufficiency.

The technical effect of this difference is a more efficient functioning of a supply chain, in case this chain is a complicated one.

The objective technical problem solved by the difference is how to schedule a more efficient functioning of a complicated supply chain.

Starting from D2, the skilled person, faced with the objective technical problem, does not find any incentive to modify the supply chain disclosed in D2 in the manner claimed.
Combination of D1 and D2.

Since neither D1 nor D2 disclose provisional reservations or updating provisional reservations to confirmed reservations, claim 1 is inventive over the combination of D1 and D2 as well.

Relevant remarks

Manufacturing, in contrast to commercial, administrative or financial services, is considered a technical environment, so inventions concerning manufacturing are more close to technicality than “inventions” relating to services (e.g. commercial, administrative or financial data processing).

[Conclusion (JPO)]

The invention of Claim 1 involves an inventive step.

[Explanation (JPO)]

The invention of Claim 1 differs from the cited invention 1 in the following respects.

(Difference 1)

While Claim 1 recites a method for managing a supply chain comprising a step of determining whether there is a need for a requisition for any component part or material of a product, for the selected source(s) to implement the supply of the product, wherein the method selects, where it is determined that there is a need for the said requisition for the component part or material, at least one second source(s), from among a plurality of sources of the component part or material, to satisfy the requisition as a demand, based on information including operation status data at the sources,

the cited invention 1 is a method for managing the supply and demand of a product and does not take into account a requisition for any component part or material of the product.

(Difference 2)

While the method of Claim 1 generates a "provisional reservation" for a supply from the selected source(s) and updates the "provisional reservations"
generated so far to confirmed reservations where, for each component part or material of the said product, it has been determined that the requisition is not necessary or the "provisional reservation" has been generated,

the method of the cited invention 1 lacks features regarding the generation of a "provisional reservation" and the updating of such a "provisional reservation" to a confirmed reservation, although it generates reservations for supply from the selected sources.

The difference 1 will be considered.

Both D1 and D2 are directed to the method regarding the supply and demand management of a product, and therefore each field of technology is mutually related.

Furthermore, both D1 and D2 address the same problem of providing a computer implemented method for the supply and demand management of a product, based on information including operation status data at a plurality of supply sources.

In this light, it would have been obvious to one of ordinary skill in the art to apply D2 to D1, to take into account, further than the supply and demand management of a product itself, a requisition for a component part or material of the product for better supply and demand management, so as to manage a supply chain by incorporating in the method the steps of determining whether there is a need for a requisition for any component part of a product and selecting, where it is determined that there is a need for the requisition for the component part, at least one second source(s), from among a plurality of sources of the component part, to satisfy the requisition as a demand, based on information including operation status data at the sources.

The difference 2 will be considered.

D2, as well as D1, is silent about the features of claim 1 regarding the generation of a "provisional reservation" and the updating of such a "provisional reservation" to a confirmed reservation.

The method of Claim 1 generates, upon the selection of one or more source(s) to satisfy the said demand for a product in the supply chain, a provisional reservation for a supply from the selected source(s), and then updates the generated provisional reservations to confirmed reservations.
where all the necessary provisional reservations for the supply chain have been generated. This enables the method of claim 1 to generate promptly provisional reservation(s) even in the case of a complicated supply chain with a number of tiers, and to find the status of insufficient supply in the supply chain, based on the existence of remaining provisional reservation(s) without being updated to confirmed reservation(s), if any. The present functionality is considered to constitute an advantageous effect, which is not readily expected from D1 and D2.

As seen from the above analysis, the features of Claim 1 regarding the generation of a "provisional reservation" and the updating of such a "provisional reservation" to a confirmed reservation cannot be deemed to be design variation etc. (namely, design variation or design choice associated with an application of specific techniques to solve certain problems) practicable upon the application of D2 to D1.

Hence, Claim 1 recites features disclosed neither in D1 nor D2 with an advantageous effect not readily expected from D1 and D2, from which it is concluded that the claimed invention involves an inventive step over D1 and D2.
2. Case C-2

(From JPHB, Annex B, Chap. 1, 3.3, Case 3-4)

Title of Invention

Tree-Structured Area Management Data

What is claimed is:

[Claim 1]

Tree-structured area management data comprising in the order of single-layer root node, multi-layer intermediate nodes and single-layer leaf nodes from the top, wherein:

the said leaf nodes have location information on distribution areas and contents data associated with a plurality of angles;

among the said intermediate nodes, those equipped with the said plurality of leaf nodes underneath have pointers to the said plurality of leaf nodes underneath and location information of the minimum bounding rectangle that bounds the said plurality of distribution areas corresponding to the plurality of leaf nodes underneath with the minimum area;

among the said intermediate nodes, those equipped with a plurality of intermediate nodes underneath have pointers to the said plurality of intermediate nodes underneath and location information of the minimum bounding rectangle that bounds the said minimum bounding rectangle owned by the plurality of intermediate nodes underneath with the minimum area;

the said root node has pointers to the said plurality of intermediate nodes underneath;

wherein the tree-structured area management data is stored in a contents distribution server; and

it is used by the said contents distribution server to perform processing to identify leaf nodes corresponding to distribution areas that geographically contain information on current location input as a search key in accordance with the pointers owned by a root node or intermediate nodes, and

to identify contents data associated with an angle closest to angle information input as a search key among contents data owned by the said
identified leaf nodes.

Drawing

[Fig. 1]

[Fig. 2]
Processing for distributing content data

Acquisition of current location and angle information of user S1

Reference to intermediate nodes underneath root nodes S2

Location information owned by intermediate nodes is compared with current location S3

Is there any intermediate node corresponding to the minimum bounding rectangle that contains current location? S4

Reference to a subordinate node of the intermediate node S5

Is the node a leaf node? S6

Location information owned by the leaf node is compared with current location S7

Is there any leaf node corresponding to the range that contains current location? S8

Among contents data owned by the leaf node, distributing to the user contents data associated with an angle closest to angle information of the user S9

Completion
Overview of the description

[Technical Field]

The present invention relates to a data structure for a technology to distribute contents data to users.

[Background Art]

There is a service for users who own gaming machines that run on specific gaming applications within specific distribution areas on a map to distribute contents data on the game related to the distribution areas to their gaming machines. In this service, if a user is found to be in a specific distribution area while he/she is in transit, one contents data related to the distribution area is automatically distributed to their gaming machine. Moreover, it is envisaged that the user physically moves to a specific distribution area where he/she may receive contents data in order to acquire desired data. Furthermore, a method is known in which an enormous number of distribution areas for this service is managed by a tree-structure so that the present invention is designed in a way that processing for identifying distribution areas that geographically contain information on current locations of users is carried out only by comparing the number of stages of the tree structure.

[Problems to be solved by the invention]

In order to further increase a game element of those applications, there is a method of distributing different contents data in accordance with angles to which users are facing even when they are in the same distribution area.

[Solution for the Problem to be solved]

The present invention is characterized in that it associates a plurality of contents data by angles with one distribution area and holds such data. The present invention acquires from a gaming machine of a user, in addition to information on current location, angle information indicating a direction to which the gaming machine is facing as a search key. By this way, when the user (gaming machine) is determined to be in a specific distribution area, contents data on the basis of the angle information of the gaming machine is distributed.

[Description of the embodiments]

As shown in the outline drawing of the present invention in Fig. 1, the contents distribution server acquires current location and angle
information of users from their gaming machines as search keys, identifies
distribution areas that geographically contain the current locations
information, and distributes contents data associated with the angle among
such data corresponding to the identified distribution areas to users. A
gaming machine is equipped with the telecommunication function, current
location acquisition function and a function to acquire an angle information
to which the gaming machine is facing by the use of an angle sensor or by
other means. An angle (0°~360°) is measured in the clockwise direction on
the basis of due north as 0°. Contents data includes items and characters
used on gaming applications that run on those gaming machines. The
contents distribution server manages distribution areas and contents data in
a way that they are included in the tree-structured area management data
as described below and stored in a memory part the server is equipped with.

(Data structure of area management data)

Each distribution area defines location information based on
information on latitude and longitude (x1, y1) (x2, y2) in the diagonal
location of the rectangle. A distribution area is bounded by one minimum
bounding rectangle together with two or more distribution areas nearby. The
minimum bounding rectangle refers to a rectangle that bounds a plurality of
distribution areas with the minimum area and defines location information
based on information on latitude and longitude in the diagonal location of the
rectangle in the same manner as distribution areas. A minimum bounding
rectangle is bounded by a superordinate minimum bounding rectangle
together with two or more minimum bounding rectangles nearby. By this way,
a tree-structured data composed of a plurality of distribution areas and
minimum bounding rectangles is formed.

A root node constitutes the uppermost location of data structure. A
node corresponding to the minimum bounding rectangle is called
intermediate node, while a node corresponding to a distribution area is
called leaf node. A root node has pointers to a plurality of intermediate nodes
underneath. Each of intermediate nodes has location information on a
corresponding minimum bounding rectangle and pointers to a plurality of
subordinate intermediate nodes or leaf nodes. Each of leaf nodes has location
information on corresponding distribution area and a plurality of contents
data associated with a plurality of angles.
Fig. 2 is an example of distribution areas and minimum bounding rectangles. The distribution areas A - C are bounded by the minimum bounding rectangle I, while the distributions areas D - F by the minimum bounding rectangle II.

Fig. 3 represents a structure of area management data formed in the case of Fig. 2. The intermediate nodes corresponding to the minimum bounding rectangle I have pointers to the leaf nodes corresponding to the distribution areas A - C, while that corresponding to the minimum bounding rectangle II has pointers to the leaf nodes corresponding to the distribution areas D - F. The uppermost root node has pointers to each of the intermediate nodes. Contents data in accordance with angle is associated with each of the leaf nodes.

(Processing for distributing contents data)

Fig. 4 is used to explain the processing for distributing contents data performed by the contents distribution server. Once the server acquires information on a current location and angle information of a user from their gaming machine as a search key (S1), it refers to the intermediate nodes underneath the root node (S2) and compares location information owned by the intermediate nodes with the information on current location (S3). Based on this comparison, it is determined whether or not there is any node corresponding to the minimum bounding rectangle that geographically contains the information on current location (S4), and if that is the case, subordinate nodes of the intermediate nodes are referred to (S5). If there is no such node, it is determined that there are no users in any of the distribution areas, and the processing completes and the processing for distributing contents data is not performed. Then, whether or not the subordinate nodes of the intermediate nodes are leaf nodes is determined (S6). If they are not leaf nodes, that is, if they are intermediate nodes, the process returns to (S3) and the processing described in (S3) - (S5) are repeated until those nodes reach a leaf node. If they are found to be leaf nodes, location information on distribution areas owned by the leaf nodes and the information on current location are compared (S7) to determine whether or not there is any leaf node corresponding to distribution areas that geographically contain the information on current location (S8). If that is the case, among a plurality of contents data associated with angles owned by the leaf node, contents data associated with an angle closest to angle
information acquired from the user is distributed thereto (S9). On the other hand, if there is no corresponding leaf node, it is determined that there are no users in any of the distribution areas, and the processing completes and the processing for distributing contents data is not performed.

Specific processing for distributing contents data is shown using the examples in Figs. 2 and 3. In these examples, a user exists in the distribution area C and is facing due south (180°). By repeating process of comparing location information on distribution areas owned by the root node and intermediate nodes with current location information, it is determined that current location information is contained geographically in the minimum bounding rectangle I. Then, location information on the distribution areas A - C owned by the subordinate leaf node underneath the intermediate nodes corresponding to the minimum bounding rectangle I is compared with information on current location to determine whether or not it is contained geographically in the distribution area C. Subsequently, among a plurality of contents data associated with angles owned by the leaf node corresponding to the distribution area C, contents data C associated with an angle (200°) closest to angle information acquired from the user (180°) is distributed thereto.

As discussed here, by distributing the contents data based on angle information of the gaming machine, it becomes possible to distribute different contents data depending on angles to which users are facing even if they are in the same area and thereby increase a game element.

[State of the art (Prior art, well-known art, etc.)]
Cited invention 1 (Invention disclosed in the cited document 1 (D1)):

Tree-structured area management data comprising in the order of single-layer root node, multi-layer intermediate nodes and single-layer leaf nodes from top, wherein:

the said leaf nodes have location information on distribution areas and contents data;

among the said intermediate nodes, those equipped with the said plurality of leaf nodes underneath have pointers to the said plurality of leaf nodes underneath and location information having a minimum bounding rectangle that bounds the said plurality of distribution areas corresponding to the plurality of leaf nodes underneath with the minimum area;

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among the said intermediate nodes, those equipped with a plurality of intermediate nodes underneath have pointers to the said plurality of intermediate nodes underneath and location information having the minimum bounding rectangle that bounds the said minimum bounding rectangles owned by the plurality of intermediate nodes underneath with the minimum area;

the said root node has pointers to the said plurality of intermediate nodes underneath;

wherein the tree-structured area management data is stored in a contents distribution server; and

it is used by the said contents distribution server to perform processing to identify leaf nodes corresponding to distribution areas that geographically contain current location information input as a search key in accordance with the pointers owned by root node or intermediate nodes.

(Problems to be solved)

To identify at high speed the unique contents data corresponding to current location information by identifying at high speed distribution areas that geographically contain the said current location information of users input as a search key.

[Drawing in D1]
Cited invention 2 (Invention disclosed in the cited document 2 (D2)):

Data to which location information indicating a location on a map of a geographical area, angle information indicating an angle in which the said geographical area has a surface and sunlight information indicating the condition of sunlight in the geographical area by angles, wherein, the data is used,

when a map of the said geographical area is displayed on a computer display, for processing to display it by associating the said sunlight information therewith by the said angle information.

(Problems to be solved)

When a geographical area is displayed on a map, sunlight information by angles relating to the geographical area is displayed.

[Drawing in D2]

(Example of data)

<table>
<thead>
<tr>
<th>Land A (positional information X)</th>
<th></th>
<th>Building B (positional information Y)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20°</td>
<td>110°</td>
<td>200°</td>
<td>290°</td>
</tr>
<tr>
<td>Receive little sunlight</td>
<td>Receive little sunlight</td>
<td>Receive good sunlight</td>
<td>Receive good sunlight</td>
</tr>
</tbody>
</table>

(Example of display on a map)
[Conclusion (EPO)]
Under the assumption that claim 1 essentially refers to a data structure, the invention of claim 1 involves an inventive step.

[Explanation (EPO)]
According to EPGL, Part G, Chap. II, 3.7.2, a computer-implemented data structure embodied on a medium has technical character. In this example, the claim defines tree-structured area management data, including its structure, and further comprises a limitation to the fact that the data is stored in a contents distribution server. The subject-matter defined by claim 1 is thus an invention in the sense of EPC Article 52(2) and (3).

Moreover, the data structure of the claim is defined in terms which inherently comprise the technical features of the contents distribution server in which it is used. In other words, the claim defines functional data, the features of which make a contribution towards an inventive step.

Regarding inventive step, D2 tackles the problem of more realistic 3D display taking into consideration angle values relevant to sunlight information. For this purpose, D2 uses a tree data structure, storing said sunlight relevant information in the leaf nodes.

In contrast to that, claim 1 tackles the problem of more efficient retrieval and distribution of contents data relevant to game player viewing angles.

Therefore, even if angle information stored in a tree data structure plays a role in both D2 and claim 1, the angle information in each case has a different origin and serves a different purpose (in claim 1, orientation of the game player, whereas in D2 sunlight angles). Therefore, the skilled person faced with the problem posed and in knowledge of D2, would not be incited to implement the sunlight angle adaptation technique of D2 in the game player orientation case of the present invention. An inventive step can thus be acknowledged.

[Conclusion (JPO)]
The invention of claim 1 involves an inventive step.
[Explanation (JPO)]

When the invention of Claim 1 and the cited invention 1 are compared, they are different in the following point.

(Difference)

The leaf node of area management data claimed in the invention of Claim 1 has a plurality of contents data by angle associated with location information on rectangular distribution areas and a plurality of angles and is used for processing to identify a leaf node corresponding to a distribution area that geographically contains information on current location input as a search key and to identify contents data associated with an angle closest to angle information input as a search key. On the other hand, the leaf node of area management data claimed in the cited invention 1 has location information of rectangular distribution areas and one contents data and is used only for processing to identify contents data associated with a leaf node corresponding to a distribution area that geographically contains information on current location input as a search key. However, it does not have contents data by angle nor it is used for processing to identify contents data associated with an angle closest to angle information input as a search key.

The above difference will be considered.

(1) Relation of technical fields

The cited invention 1 and the cited invention 2 have a common technical field in that both of them relate to a technology to manage information on geographical areas.

(2) Similarity of problems to be solved

The problem to be solved by the cited invention 1 is, by identifying at high speed a distribution area that geographically contains information on current location of a user input as a search key, to identify at high speed the unique contents data corresponding to the said information on current location, while the problem to be solved by the cited invention 2 is, when a geographical area is displayed on a map, display specific information by angle with respect to the said geographical area. Therefore, the problems to be solved by the two inventions are not similar.
(3) Similarity of operations or functions

The cited invention 1 is tree-structured data and used for processing to, by identifying at high speed a distribution area that geographically contains information on current location of a user input as a search key, to identify at high speed the unique contents data corresponding to the said information on current location, through information processing in accordance with pointers owned by the root nodes and intermediate nodes. On the other hand, the cited invention 2 is data with which a plurality of specific information is associated by angle of geographical areas and used for processing to display the plurality of information by angle by associating it with the geographical areas, and is not used for processing to identify information based on an input search key. Thus, the two invention are not common in terms of operations or functions.

When considering the circumstances described from (1) to (3) above (considered motivation) comprehensively, it is not determined that there is a motivation of applying the cited invention 2 to the cited invention 1.

Moreover, an effect claimed in the invention of Claim 1 that the leaf node of area management data has a plurality of contents data by angle associated with plurality of angles so that different contents data may be distributed depending on angles to which users are facing even if they are in the same area is advantageous and not predicted based on the cited invention 1 or cited invention 2.

When taking the above circumstances into consideration comprehensively, it is not determined that a person skilled in the art could have easily arrived at the invention of Claim 1 on the basis of the cited invention 1 and the cited invention 2.
3. Case C-3

(From EPGL, Part G, Chap. VII, 5.4.2.1 Example 1)

Title of invention

Method of facilitating shopping on a mobile device

[Claim 1]

Method of facilitating shopping on a mobile device wherein:

(a) the user selects two or more products to be purchased;
(b) the mobile device transmits the selected products data and the device location to a server;
(c) the server accesses a database of vendors to identify vendors offering at least one of the selected products;
(d) the server determines, on the basis of the device location and the identified vendors, an optimal shopping tour for purchasing the selected products by accessing a cache memory in which optimal shopping tours determined for previous requests are stored; and
(e) the server transmits the optimal shopping tour to the mobile device for displaying.

Overview of the description

(Omitted)

[State of the art (Prior art, well-known art, etc.)]
Cited invention 1 (Invention disclosed in the cited document 1 (D1)):

A method for facilitating shopping on a mobile device wherein the user selects a single product and the server determines from a database the vendor selling the selected product nearest to the user and transmits this information to the mobile device.

Cited invention 2 (Invention disclosed in the cited document 2 (D2)):

A travel planning system for determining travel trips, listing a set of places to visit, wherein the system accesses for the efficiency purpose a cache memory storing results of previous queries.
[Conclusion (EPO)]

The invention of Claim 1 does not involve an inventive step.

[Explanation (EPO)]

Application of the steps of the problem-solution approach according to EPGL, Part G, Chap. VII, 5.4:

Step (i): The features contributing to the technical character are prima facie identified as a distributed system comprising a mobile device connected to a server computer which has a cache memory and is connected to a database.

Step (ii): Document D1, which discloses a method for facilitating shopping on a mobile device wherein the user selects a single product and the server determines from a database the vendor selling the selected product nearest to the user and transmits this information to the mobile device, is selected as the closest prior art.

Step (iii): The differences between the subject-matter of claim 1 and D1 are:

(1) The user can select two or more products to purchase (instead of a single product only).
(2) An "optimal shopping tour" for purchasing the two or more products is provided to the user.
(3) The optimal shopping tour is determined by the server by accessing a cache memory in which optimal shopping tours determined for previous requests are stored.

Differences (1) and (2) represent modifications of the underlying business concept, since they define producing an ordered list of shops to visit which sell these products. No technical purpose is served, and no technical effects can be identified from these differences. Hence, these features make no technical contribution over D1. On the other hand, difference (3) makes a technical contribution as it relates to the technical implementation of differences (1) and (2) and has the technical effect of enabling rapid determination of the optimal shopping tour by accessing previous requests which are stored in a cache memory.
Step (iii)(c): The objective technical problem is to be formulated from the perspective of the person skilled in the art as an expert in a technical field. Such a person is not deemed to have any expertise in business-related matters. In the present case, he can be defined as an expert in information technology who gains knowledge of the business-related features (1) and (2) as part of the formulation of the technical problem to be solved, as would be the case in a realistic situation in the form of a requirement specification. The objective technical problem is thus formulated as how to modify the method of D1 to implement in a technically efficient manner the non-technical business concept defined by the differences (1) and (2), which is given as a constraint to be met.

Obviousness: Following requirement (1), it would have been a matter of routine for the skilled person to adapt the mobile device used in D1 so as to enable the user to select two or more products instead of a single one. It would also have been obvious to assign the task of determining the optimal shopping tour (arising from requirement (2)) to the server, by analogy with the server likewise determining the nearest vendor in D1. Since the objective technical problem further requires a technically efficient implementation, the skilled person would have looked for efficient technical implementations of the determination of a tour. A second document D2 discloses a travel planning system for determining travel trips, listing a set of places to visit, and addresses this technical problem: the system of D2 accesses for this purpose a cache memory storing results of previous queries. The skilled person would thus have considered the teaching of D2 and adapted the server in D1 to access and use a cache memory as suggested in D2 so as to provide a technically efficient implementation of the determination of the optimal shopping tour, i.e. difference (3). Hence, no inventive step is involved in the sense of EPC Article 52(1) and 56.

Remarks: The example shows a typical application of the approach developed in T 641/00 (COMVIK). The analysis of technical effects is performed in detail at step (iii) to see if the differences from the closest prior art comprise features making a technical contribution. This analysis refines the initial finding of step (i) by identifying the feature of accessing the cache
memory for results of previous requests in the step of determining the tour as a technical feature. Note that in this case step (i) would not need to be indicated explicitly in the reasoning. In step (iii)(c), the non-technical modifications to the business concept are given to the skilled person as a constraint to be met. Whether or not the new business concept is innovative is here irrelevant for the assessment of inventive step, which has to be based on the features of its technical implementation.

[Conclusion (JPO)]
The invention of Claim 1 involves an inventive step.

[Explanation (JPO)]
When the invention of Claim 1 and the cited invention 1 are compared, they differ in the following respects.

(Difference 1)
In the invention of Claim 1, the number of products that the user selects is "two or more", and the server accesses "a database of vendors" and identifies "vendors offering at least one" of the selected products on the basis of which the optimal shopping tour is determined. On the other hand, in the cited invention 1, the number of products that the user selects is "single", and the server accesses an unspecified database to determine "the vendor nearest to the user".

(Difference 2)
In the invention of Claim 1, the server "determines, on the basis of the device location and the identified vendors, an optimal shopping tour for purchasing the selected products by accessing a cache memory in which optimal shopping tours determined for previous requests are stored". On the other hand, the cited invention 1 only recites that the server determines the vendor nearest to the user, but recites nothing about determining such an "optimal shopping tour".

For the sake of convenience, Difference 2 will be considered first.
The "optimal shopping tour" of the invention of Claim 1 is determined
after the server has identified vendors in the step (c). Accordingly, it is natural to interpret it as the optimal route according to which the user visits the vendors in this order.

On the basis of this consideration, the cited invention 2 will be considered. The cited invention 2 is an invention about a travel planning system, and only recites that a set of places to visit are listed and results of previous queries are stored in a cache memory, so that the system can access it. Thus, it cannot be said that the cited invention 2 involves the concept of the optimal tour for visiting the listed places and that the cited invention 2 does not give any recitation about storing in a cache memory optimal tours for visiting the places in the optimal order.

When the common technical knowledge is considered for "a set of places to visit", it may be possible to suppose that the cited invention 2 recites that optimal tours for visiting the places are stored in a cache memory, but applying this recitation to the cited invention 1 to arrive at the matters of the invention of Claim 1 described concerning Difference 2 would have required motivation. However, the cited invention 1 does not involve the concept of a shopping tour for visiting vendors in an optimal way. Furthermore, even if the cited invention 1 is capable of identifying two or more vendors, it would be natural to interpret that the server determines the respective vendors selling the respective products nearest to the user. In this way, the cited invention 1 does not inherently have the problem to be solved of visiting the vendors in the optimal way in the shopping tour, and the cited invention 1 and the cited invention 2 do not have a common problem to be solved. Moreover, between the cited invention 1 and the cited invention 2, there is no commonality in terms of technical fields or functions which could have been motivation for applying the cited invention 2 to the cited invention 1.

Then, since the cited invention 1 and the cited invention 2 don't have the concept of optimal tours, or, even if the cited invention 2 has the concept of optimal tours, there is no motivation to apply the cited invention 2 to cited invention 1.

Furthermore, because of the matter described concerning Difference 2, the invention of Claim 1 involves an advantageous effect in that it can present the user with an optimal shopping tour for visiting vendors.

Thus, it cannot be said that the person skilled in the art could have arrived at the matters of the invention of Claim 1 described concerning
Difference 2, by applying the cited invention 2 to the cited invention 1.

Next, Difference 1 will be considered.

As was discussed in Difference 2 above, the cited invention 1 doesn’t involve the concept of a shopping tour for visiting vendors in an optimal way. Furthermore, even if the cited invention 1 was capable of identifying two or more vendors, it would be natural to interpret that the server determines the respective vendors selling the respective products nearest to the user. Accordingly, even if in the cited invention 1 the user can select two or more products, it cannot be said that the person skilled in the art could have easily arrived at the idea of identifying "vendors offering at least one" of the selected products on the basis of which the server determines the optimal shopping tour.

Furthermore, because of the matter described concerning Difference 1, the invention of Claim 1 involves an advantageous effect in that vendors required to determine the optimal shopping tour can be identified.

When taking the above circumstances into consideration comprehensively, it is not determined that a person skilled in the art could have easily arrived at the invention of Claim 1 on the basis of the cited invention 1 and the cited invention 2.
4. Case C-4

(From EPGL, Part G, Chap. VII, 5.4.2.2 Example 2)

Title of invention
A computer-implemented method for brokering offers and demands in the field of transporting freight

[Claim 1]
A computer-implemented method for brokering offers and demands in the field of transporting freight, comprising the following steps:
(a) receiving transportation offers/demands from users, including location and time data;
(b) receiving current location information of the users from GPS terminals with which the users are equipped;
(c) after receiving a new offer/demand request, verifying if there are previous offers/demands not yet satisfied that can respond to the new request;
(d) if so, selecting the one for which the current locations of both users are closest; and
(e) otherwise storing the new request.

Overview of the description
(Omitted)

[State of the art (Prior art, well-known art, etc.)]
Cited invention 1 (Invention disclosed in the cited document 1 (D1)):
A method of order management in which a server computer receives location information from GPS terminals.

[Conclusion (EPO)]
The invention of Claim 1 does not involve an inventive step.

[Explanation (EPO)]
Application of the steps of the problem-solution approach according to
Step (i): Underlying the claimed method is the following business method:

A method for brokering offers and demands in the field of freight transportation, comprising:
(a) receiving transportation offers/demands from users, including location and time data;
(b) receiving information regarding the current location of the users;
(c) after receiving a new offer/demand request, verifying if there are previous offers/demands not yet satisfied that can respond to the new request;
(d) if so, selecting the one for which the current locations of both users are closest; and
(e) otherwise storing the new request.

Such a business method is per se non-technical and excluded under EPC Article 52(2)(c) and (3). Brokering offers and demands is a typical business activity. Using the geographical location of users is the kind of criterion which a transportation broker could specify as part of a business method based on non-technical, business considerations only. This business method does not serve any technical purpose in the context of the invention and thus does not contribute to its technical character.

Therefore, only the features related to the technical implementation of this business method can be identified as the features contributing to the technical character of the invention:
- The business method steps are carried out by a computer.
- The current location information is received from GPS terminals.

Step (ii): As a suitable starting point, document D1, which discloses a method of order management in which a server computer receives location information from GPS terminals, is selected as the closest prior art.

Step (iii): The difference between the subject-matter of claim 1 and D1 is thus the computer implementation of the steps of the business method defined above.
The technical effect of this difference is merely the automation of the business method underlying claim 1. The conclusion reached in step (i) holds, since the only distinguishing feature making a technical contribution is the technical implementation of this business method.

Step (iii)(c): The objective technical problem is formulated as how to adapt the method of D1 so as to implement the business method of brokering offers and demands according to the user's current location. The person skilled in the art is considered to be a software project team and is given the knowledge of the business method in the form of a requirement specification.

Obviousness: Adapting the method of D1 to execute the business method steps is straightforward and requires routine programming only. Therefore, no inventive step is involved in the sense of EPC Article 52(1) and Article 56.

Remarks: In this example, it was clear from the initial analysis at step (i) that underlying the claimed method was a method for brokering offers and demands, which as such is a business method. The features defining the business method were easily separable from the technical features of its computer implementation. Therefore, this example illustrates a line of argument in which it was possible in step (i) to determine all the features which contribute to the technical character of the invention and all those which do not. This line of argument pertains more to the field of computer-implemented business methods and might be less suitable in other fields.

[Conclusion (JPO)]
The invention of Claim 1 involves an inventive step.

[Explanation (JPO)]
When the invention of Claim 1 and the cited invention 1 are compared, they differ in the following respect.

(Difference)
The invention of Claim 1 is directed to a computer-implemented method
for brokering offers and demands in the field of transporting freight, comprising the following steps of:

(a) receiving transportation offers/demands from users, including location and time data;

(c) after receiving a new offer/demand request, verifying if there are previous offers/demands not yet satisfied that can respond to the new request;

(d) if so, selecting the one for which the current locations of both users are closest; and

(e) otherwise storing the new request,

whereas in the cited invention 1 a concrete method of order management is not clear except that a server computer receives location information from GPS terminals.

The difference will be considered.

For a computer-implemented method for brokering offers and demands in the field of transporting freight, there is no prior art which suggests inclusion of the steps defined as (a) to (e). Also, there are no grounds sufficient for supporting the discussion that the inclusion of the said steps can be deemed to be design variation etc. (namely, design variation or design choice associated with an application of specific techniques to solve certain problems) of the cited invention 1.

Furthermore, because of the matter described concerning the difference, the invention of Claim 1 involves an advantageous effect over the cited invention 1 in that it provides a specific method for brokering offers and demands in the field of transporting freight, which has not been realized, is realized by a computer.

When taking the above circumstances into consideration comprehensively, it is not determined that a person skilled in the art could have easily arrived at the invention of Claim 1, on the basis of the cited invention 1.
5. Case C-5

(From EPGL, Part G, Chap. VII, 5.4.2.3 Example 3)

Title of invention

A system for the transmission of a broadcast media channel to a remote client over a data connection

[Claim 1]

A system for the transmission of a broadcast media channel to a remote client over a data connection, said system including:

(a) means for storing an identifier of the remote client and an indication of an available data rate of the data connection to the remote client, said available data rate being lower than the maximum data rate for the data connection to the remote client;

(b) means for determining a rate at which data is to be transmitted based on the indication of the available data rate of the data connection; and

(c) means for transmitting data at the determined rate to said remote client.

Overview of the description

Under some pricing models, a customer may choose to pay a lower amount and receive a lower bit rate service when their line is capable of receiving a higher rate. Accordingly, the quality made available to the customer is preferably determined by the quality of service purchased and not necessarily the maximum quality available over the line.

[State of the art (Prior art, well-known art, etc.)]

Cited invention 1 (Invention disclosed in the cited document 1 (D1)):

A system for broadcasting video over an xDSL connection to the set-top boxes of subscribers, the said system comprising:

a database storing identifiers of subscribers’ computers and, in association with them, an indication of the maximum data rate for the data connection to each subscriber’s computer; and

means for transmitting the video to a subscriber’s computer at the maximum data rate stored for said computer.
[Conclusion (EPO)]

The invention of Claim 1 does not involve an inventive step.

[Explanation (EPO)]

Application of the steps of the problem-solution approach according to EPGL, Part G, Chap. VII, 5.4.: 

Step (i): All features are prima facie identified as technical.

Step (ii): Document D1, which discloses a system for broadcasting video over an xDSL connection to the set-top boxes of subscribers, is selected as the closest prior art. The system comprises a database storing identifiers of subscribers’ computers and, in association with them, an indication of the maximum data rate for the data connection to each subscriber’s computer. The system further comprises means for transmitting the video to a subscriber’s computer at the maximum data rate stored for said computer.

Step (iii): The differences between the subject-matter of claim 1 and D1 are: (1) Storing an indication of an available data rate of the data connection to the remote client, said available data rate being lower than the maximum data rate for the data connection to the remote client.

(2) Using said available data rate to determine the rate at which the data is transmitted to the remote client (instead of transmitting the data at the maximum data rate stored for said remote client as in D1).

In order to determine if any technical effects arise from these differences, the following disclosure of the description is taken into account:

"Under some pricing models, a customer may choose to pay a lower amount and receive a lower bit rate service when their line is capable of receiving a higher rate. Accordingly, the quality made available to the customer is preferably determined by the quality of service purchased and not necessarily the maximum quality available over the line."

The feature of "available data rate being lower than a maximum data rate for the data connection to the remote client" is the result of a technical
implementation of a pricing model which allows a customer to choose from several data rates, each rate being associated with a corresponding level of quality of service and being priced accordingly. This pricing model is itself non-technical through being of a financial, administrative or commercial nature and thus falling under the exclusion of schemes, rules and methods for doing business in EPC Article 52(2)(c). Thus the only technical effect achieved is determining the transmission data rate in accordance with the pricing model. The pricing model itself represents an aim to be achieved in a non-technical field which may be included in the formulation of the objective technical problem as a constraint to be met.

Step (iii)(c): The objective technical problem is therefore formulated as how to implement in the system of D1 a pricing model which allows the customer to choose to pay a lower amount to receive broadcast media channels at a quality of service lower than the highest possible quality of service (i.e. at a data rate lower than the maximum possible data rate of the data connection). The pricing model is considered to be provided to the skilled person as part of the objective technical problem.

Obviousness: Given the task of implementing this pricing model, it would be obvious to the skilled person that the maximum data rate purchased by a subscriber (i.e. the "available data rate" of claim 1), which can only be lower or equal to the maximum data rate of the data connection to the subscriber’s computer (i.e. the "remote client" of claim 1), would have to be stored for each subscriber and used by the system to determine the rate at which data is to be transmitted to a subscriber. Therefore, no inventive step is involved in the sense of EPC Article 52(1) and Article 56.

Remarks: This example illustrates a claim which involves a complex mix of technical and non-technical features. On a prima facie basis in step (i), all features appeared to be technical. After comparison with D1, a detailed analysis of the technical character of the contribution made by the invention over D1 was possible at step (iii). This detailed analysis revealed that the purpose of transmitting data at a rate based on a pre-stored available data rate, lower than the maximum data rate for the data connection, was not technical but commercial. Since the contribution over D1 was the technical
implementation of a non-technical concept (pricing model), incorporating this non-technical concept in the formulation of the objective technical problem, as in T 641/00, was particularly appropriate.

[Conclusion (JPO)]

The invention of Claim 1 involves an inventive step.

[Explanation (JPO)]

When the invention of Claim 1 and the cited invention 1 are compared, they differ in the following respect.

(Difference)

The data rate, that is stored with an identifier of a remote client and that is a basis for determining a rate at which data is to be transmitted to the remote client, is lower than the maximum data rate for the data connection to the remote client in the invention of Claim 1, whereas the data rate is the maximum data rate for the data connection to the remote client in the cited invention 1.

The difference will be considered.

For a system for the transmission of a broadcast media channel to a remote client over a data connection, there is no prior art which suggests the feature that the data rate, that is stored with an identifier of a remote client and that is a basis for determining a rate at which data is to be transmitted to the remote client, is lower than the maximum data rate for the data connection to the remote client. Also, there are no grounds sufficient for supporting the discussion that determining the data rate in the above manner can be deemed to be design variation etc. (namely, design variation or design choice associated with an application of specific techniques to solve certain problems) of the cited invention 1.

Moreover, because of the matter described concerning the difference, the invention of Claim 1 involves an advantageous effect over the cited invention 1 in that it constitutes a system which enables to arbitrarily set to a data rate lower than the maximum data rate for the data connection to each remote customer using the identifier of the remote customer. Furthermore, it
can be also inferred that the system has the effect of reducing error and congestion in data transmission.

When taking the above circumstances into consideration comprehensively, it is not determined that a person skilled in the art could have easily arrived at the invention of Claim 1 on the basis of the cited invention 1 and the cited invention 2.
6. Case C-6

(From EPGL, Part G, Chap. VII, 5.4.2.4 Example 4)

Title of invention
A computer-implemented method for the numerical simulation of the performance of an electronic circuit subject to 1/f noise

[Claim 1]
A computer-implemented method for the numerical simulation of the performance of an electronic circuit subject to 1/f noise, wherein:
(a) the circuit is described by a model featuring input channels, noise input channels and output channels;
(b) the performance of the input channels and the output channels is described by a system of stochastic differential equations;
(c) an output vector is calculated for an input vector present on the input channels and for a noise vector y of 1/f-distributed random numbers present on the noise input channels; and
(d) the noise vector y is generated by the following steps:
   (d1) setting the number n of random numbers to be generated;
   (d2) generating a vector x of length n of Gaussian-distributed random numbers;
   (d3) generating the vector y by multiplying the vector x with a matrix L defined according to equation E1*.

* It is assumed that equation E1 is explicitly specified in the claim.

Overview of the description
The claim is directed to a method carried out by a computer for the numerical simulation of the performance of an electronic circuit subject to 1/f noise, which is one of the main sources of noise in electronic circuits. Features (a)-(c) specify the mathematical model used in the numerical simulation. It involves a noise vector y of 1/f-distributed random numbers, i.e. random numbers having a particular statistical property typical of real (physical) 1/f noise. Steps (d1)-(d3) define the mathematical algorithm used for generating these random numbers. According to the description, this
mathematical algorithm is particularly efficient in terms of computation time and storage resources required to generate the random numbers needed for the simulation.

[State of the art (Prior art, well-known art, etc.)]
Cited invention 1 (Invention disclosed in the cited document 1 (D1)):
A method for numerical simulation of the performance of an electronic circuit subject to 1/f noise with steps (a)-(c) but with a different mathematical algorithm for generating the 1/f-distributed random numbers.

[Conclusion (EPO)]
The invention of Claim 1 involves an inventive step.

[Explanation (EPO)]
Application of the steps of the problem-solution approach according to EPGL, Part G, Chap. VII, 5.4.:

Step (i): The use of a computer to carry out the claimed method is a clearly technical feature. The question is whether the other features, in particular the mathematical algorithm of steps (d1)-(d3), also contribute to the technical character of the claimed subject-matter. Considered in isolation, steps (d1)-(d3) represent a mathematical method with no technical character. However, the claim is not directed to this mathematical method as such (which would be excluded from patentability under EPC Article 52(2)(a) and (3)) but is limited to a computer-implemented method in which this mathematical method serves the numerical simulation of the performance of an electronic circuit subject to 1/f noise, which is considered to be a technical purpose. Features (a)-(c) ensure that the claim is functionally limited to this technical purpose by specifying the mathematical model used in the simulation and how the generated noise vector \( y \) is used in it, i.e. they establish the link between the stated purpose of the method and steps (d1)-(d3). Furthermore, the mathematical model specified by features (a)-(c) defines how the numerical simulation is performed and thus also contributes to the above-mentioned technical purpose. As a result, all the steps relevant to the circuit simulation, including the mathematically expressed claim
features (d1)-(d3), contribute to the technical character of the method to the extent that they are relevant for circuit simulation.

Step (ii): Document D1, which discloses a method for numerical simulation of the performance of an electronic circuit subject to 1/f noise with steps (a)-(c) but with a different mathematical algorithm for generating the 1/f-distributed random numbers, is selected as closest prior art.

Step (iii): The difference between the methods of claim 1 and D1 is the mathematical algorithm used to generate the vector of 1/f-distributed random numbers, i.e. steps (d1)-(d3). The algorithm defined by steps (d1)-(d3) requires less computer resources than that used in D1. In the context of the claimed method, this results directly in a reduction of the computer resources required for the numerical simulation of the performance of an electronic circuit subject to 1/f noise, which is the technical effect achieved over D1.

Step (iii)(c): The objective technical problem solved with respect to D1 is formulated as how to generate the 1/f-distributed random numbers used in the numerical simulation of the performance of an electronic circuit subject to 1/f noise in a manner which requires less computer resources.

Obviousness: No prior art suggests the algorithm defined by steps (d1)-(d3) as a solution to the objective technical problem. The invention as claimed is therefore considered to involve an inventive step.

Remarks: This example illustrates the situation addressed in EPGL, Part G, Chap. VII, 5.4, second paragraph: features which, when taken in isolation, are non-technical, but do, in the context of the claimed invention, contribute to producing a technical effect serving a technical purpose. Such features are considered to contribute to the technical character of the invention and may therefore support the presence of an inventive step.

Note that if the claim were not limited to the numerical simulation of an electronic circuit subject to 1/f noise, the mathematical algorithm defined by steps (d1)-(d3) would not serve any technical purpose and would thus not be
considered to contribute to the technical character of the claim (requiring less computer resources than another mathematical algorithm being on its own not sufficient in this respect).

[Conclusion (JPO)]

The invention of Claim 1 involves an inventive step.

[Explanation (JPO)]

When the invention of Claim 1 and the cited invention 1 are compared, they differ in the following respect.

(Difference)

According to the invention of Claim 1, the noise vector y is generated by the steps of: (d1) setting the number n of random numbers to be generated; (d2) generating a vector x of length n of Gaussian-distributed random numbers; and (d3) generating the vector y by multiplying the vector x with a matrix L defined according to equation E1, whereas in the cited invention 1 it is generated according to a different mathematical algorithm.

The difference will be considered.

For the numerical simulation of the performance of an electronic circuit subject to 1/f noise, there is no prior art that suggests the algorithm defined by the steps (d1) to (d3). Also, there are no grounds sufficient for supporting the discussion that the adopting this algorithm can be deemed to be design variation etc. (namely, design variation or design choice associated with an application of specific techniques to solve certain problems) of the cited invention 1.

Furthermore, because of the matter described concerning the difference, the invention of Claim 1 involves an advantageous effect over the cited invention 1 in that this mathematical algorithm is particularly efficient in terms of computation time and storage resources required to generate the random numbers needed for the simulation.

When taking the above circumstances into consideration comprehensively, it is not determined that a person skilled in the art could have easily arrived at the invention of Claim 1, on the basis of the cited
invention 1.