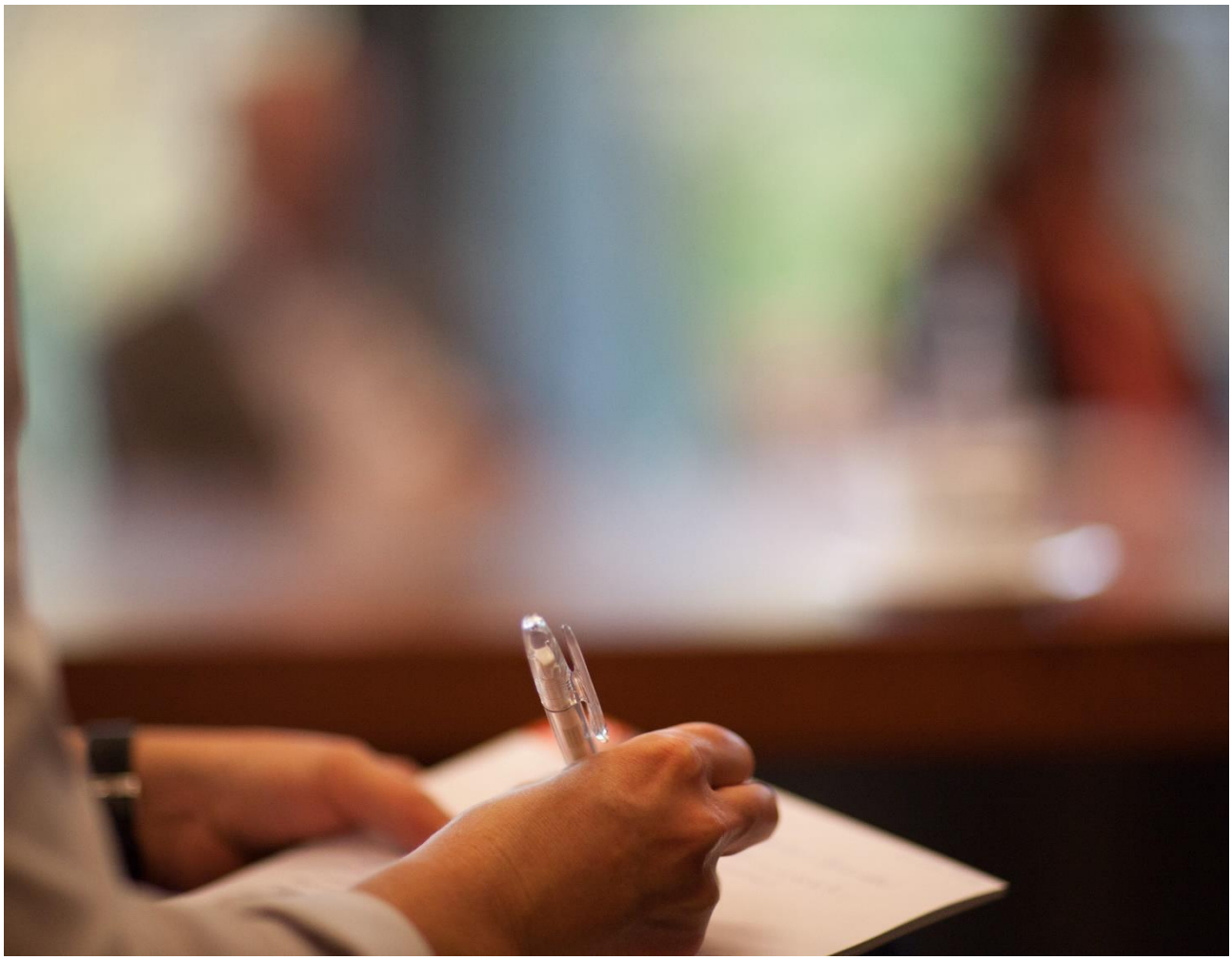
Europäisches Patentamt
European Patent Office
Office européen des brevets

Learning path for patent examiners

Sufficiency of disclosure: Intermediate level

Version: May 2024



Introduction

This publication, "Sufficiency of disclosure, Intermediate level", is part of the "Learning path for patent examiners" series edited and published by the European Patent Academy. The series is intended for patent examiners at national patent offices who are taking part in training organised by the European Patent Office (EPO). It is also freely available to the public for independent learning.

Topics covered include novelty, inventive step, clarity, unity of invention, sufficiency of disclosure, amendments and search. Also addressed are patenting issues specific to certain technical fields:

- patentability exceptions and exclusions in biotechnology
- assessment of novelty, inventive step, clarity, sufficiency of disclosure and unity of invention for chemical inventions
- the patentability of computer-implemented inventions, business methods, game rules, mathematics and its applications, presentations of information, graphical user interfaces and programs for computers
- claim formulation for computer-implemented inventions

Each publication focuses on one topic at entry, intermediate or advanced level. The explanations and examples are based on the European Patent Convention, the Guidelines for Examination in the EPO and selected decisions of the EPO's boards of appeal. References are made to the Patent Cooperation Treaty and its Regulations whenever appropriate.

The series will be revised annually to ensure it remains up to date.

Disclaimer

All references to natural persons are to be understood as applying to all genders.

Contents

Legal references

1. Learning objectives

Participants to this course will learn:

- The definition of "undue burden".
- The meaning of "chance", "trial and error", "speculative disclosure".
- The definition of an "essential feature" in a claim.
- The difference between Articles 83 and 84 EPC with respect to "essential features" in claims.
- The meaning of a "non-working embodiment".
- The importance of "parameters" in claims.

2. Undue burden

For disclosure to be sufficient, the skilled person must be able to carry out the invention over the whole claimed scope at the effective filing date using their common general knowledge and all the information in the application **without undue burden** or inventive effort.

A detailed description of at least one way of carrying out the invention must be given as mentioned in Rule 42(1)(e) EPC. Since the application is addressed to the person skilled in the art, it is neither necessary nor desirable for details of well-known ancillary features to be given, but the description must disclose any feature essential for carrying out the invention in sufficient detail to render it apparent to the skilled person how to put the invention into practice. A single example may suffice, but where the claims cover a broad field the application is not usually regarded as satisfying the requirement of Article 83 EPC unless the description gives several examples or describes alternative embodiments or variations extending over the area protected by the claims.

However, the facts and evidence of the case must be taken into account. There are some instances where even an extremely broad field is sufficiently exemplified by a limited number of examples or even one example (see also Guidelines F-IV, 6.3). In these latter cases, the application must contain, in addition to the examples, sufficient information to allow the person skilled in the art, using common general knowledge, to perform the invention over the whole area claimed without undue burden and without needing inventive skill (see T 727/95).

In this context, the "whole area claimed" is to be understood as substantially any embodiment falling within the ambit of a claim, although a limited amount of trial and error may be permissible, e.g. in an unexplored field or when there are many technical difficulties (see T 226/85 and T 409/91).

Legal references:
GL F-III, 1, CL Book II.C.1, R. 42(1)(e) EPC

3. Examples of undue burden

There is "undue burden" in the following cases:

- Only trial-and-error experimentation can lead to embodiments falling under the claims.
- More than routine experimentation is required.
- A research programme is necessary (if, for example, essential features are not sufficiently specified and need to be determined by research).
- The method used to measure any parameters has not been indicated.

Examples

In T 345/09, claim 1 was about a method for manufacturing parts with very high mechanical properties. Because the skilled person was faced with a lack of relevant examples relating to the invention's essential mechanical features, they would have had to carry out a number of tests in order to arrive at it. Given the number of mechanical features and parameters, the research programme facing the skilled person was, the board concluded, so extensive that it amounted to an undue burden.

Legal references:
GL F-III, 1, CL Book II.C.5.3, CL Book II.C.5.4, T 345/09

4. Performance relies on chance or mere trial and error

The invention can be deemed insufficiently disclosed if (a) performance of the invention relies on chance (unrepeatable or unreliable results, for example microbiological processes involving mutations) or (b) carrying out the invention is a matter of trial and error (e.g. the skilled person must choose from numerous parameters or identify compounds satisfying a parameter given in a claim).

These cases must be distinguished from cases where repeated success is assured despite being accompanied by a proportion of failures, as can arise, for example, in the manufacture of small magnetic cores or electronic components. In the latter case, provided the satisfactory parts can be readily sorted by a non-destructive testing procedure, no objection arises under Article 83 EPC.

Examples

Microbiological processes involving mutations may produce unreliable/unrepeatable results. Performing the invention is a matter of trial and error if the skilled person must choose from numerous parameters or identify compounds satisfying a parameter given in a claim.

Legal references:
GL F-III, 3, T 105/14, CL Book II.C.6.7

5. Speculative disclosure

An invention may be regarded as being sufficiently disclosed even if a claim includes a hypothetical embodiment (speculative disclosure) that cannot be reproduced (see T 519/07 and Case Law of the Boards of Appeal, I.C.6.2). This presumes that there are other embodiments of the claimed invention which are disclosed and which can be carried out by the skilled person.

Examples

An invention is regarded as sufficiently disclosed even if there are embodiments which cannot be reproduced. An example of this would be chemical compounds covered by a Markush formula which are unstable and cannot be synthesised.

Legal references:
GL F-III, 5.1, CL Book I.D.3.5.3, CL Book II.C.6.2, T 519/07, T 515/00

6. Excessive generalisation

An invention is regarded as being sufficiently disclosed only if the disclosure allows the invention to be performed **in the whole range claimed** and not **only in some** members of the claimed class. Sufficiency of disclosure presupposes that the skilled person can obtain all the embodiments falling within the scope of the claims.

This principle applies to all inventions, whether defined by functional features or by any other means. Examiners should remember that more technical details and more than one example may be required to support claims of broad scope, but this should be decided on a case-by-case basis.

Examples

Consider the following invention, which is regarded as being sufficiently disclosed.

The first claim defines a "method of producing an impact-resistant helmet, characterised in that a metal is coated on the surface of a ceramic helmet, wherein the coating has a thickness of 20 to 50 µm". The description discloses two helmets made from a ceramic where an aluminium coating is applied to the ceramic at a thickness of 30 or 40 µm.

Legal references:

CL Book II.C.5.4, T 409/91, T 435/91, T 172/99, T 19/90, T 418/91, T 923/92, T 548/91, T 659/93

7. Essential features missing entirely or only in the claims

The claims, which define the matter for which protection is sought, must be clear, meaning not only that a claim must be comprehensible from a technical point of view, but also that it must define clearly all the essential features of the invention (see T 32/82). Furthermore, the requirement that the claims be supported by the description (Article 84 EPC) applies to features which are explicitly presented in the description as being essential for carrying out the invention (see T 1055/92). A lack of essential features in the independent claim(s) is therefore to be dealt with under the clarity and support requirements.

Essential features of a claim are those necessary for solving the technical problem addressed by the application (for example reducing vibration, improving light resistance or providing a more compact printer). Any features which do not actually contribute to the solution of the problem, despite being consistently mentioned in the context of the invention throughout the application, are not essential features.

Generally, the technical effect or result produced by the feature will provide the key to determining whether the feature contributes to solving the problem (see also Guidelines G-VII, 5.2). If a claim is directed to a process for producing the product of the invention, then the process as claimed must be one which, when carried out in a manner which would seem reasonable to a person skilled in the art, necessarily has as its result that specific product. Otherwise, there is an internal inconsistency and therefore lack of clarity in the claim (Article 84 EPC). Where patentability depends on a technical effect, the claims must be so drafted as to include all the technical features of the invention which are essential for the technical effect (see T 32/82).

If there are "missing essential features", objections of lack of clarity or insufficient disclosure may arise depending on the situation (Articles 84 and 83 EPC, respectively).

For example, if an essential technical feature is missing from the claims but disclosed in the description, the claims are regarded as not being supported by the description (i.e. as lacking clarity). In this case, examiners should ensure that the granted claims include this essential technical feature, according to Article 84 EPC.

On the other hand, if an essential feature is missing from the claims and not disclosed anywhere in the application, then the invention is insufficiently disclosed and must be refused, following the requirements of Article 83 EPC.

It is important to remember that any such insufficiency cannot be remedied without adding subject-matter to the application and infringing Article 123(2) EPC, so the application will be refused in these cases.

Examples

In T 1188/15 relating to water shorts, the board of appeal decided that the invention had been insufficiently disclosed because the skilled person would not have been able to carry out the invention without knowing the direction of measurement of the claimed stretch prior to tensile failure of the woven shorts. No details had been given in the description and the skilled person would know that different textiles exhibit different stretch behaviour depending on the direction of measurement.

Legal references:

Art. 84 EPC, GL F-IV, 4.5, GL F-III, 2, T 32/82, T 1055/92

8. Non-working embodiments

The fact that only variants of the invention, e.g. one of a number of embodiments of it, are not capable of being performed does not immediately give rise to the conclusion that the subject-matter of the invention is incapable of being performed, i.e. is incapable of resolving the problem addressed and therefore of achieving the desired technical result.

Those parts of the description relating to the variants of the invention which are incapable of being performed and the relevant claims must, however, then be deleted or marked as background information that is not part of the invention (see Guidelines F-IV, 4.3(iii)) at the division's request if the deficiency is not remedied. The specification must then be so worded that the remaining claims are supported by the description and do not relate to embodiments which have proved to be incapable of being performed.

In some cases (for example claims relating to a combination of ranges or Markush claims), the scope of the claim might encompass many alternatives, some of which correspond to non-working embodiments. In these cases, the presence of non-working embodiments in the claim is of no harm provided that the specification contains sufficient information on the relevant criteria to identify the working embodiments within the claimed alternatives (G 1/03). See also Guidelines G-VII, 5.2.

Examples

Examples in this context include claims relating to a measurement system based on the detection of radiations emitted from an object. The application as a whole describes in detail how the claimed invention works with the detection of gamma rays. However, the same application is silent on how the measurement system could also measure other types of radiation, e.g. neutrons, cosmic rays etc.

Legal references:

GL F-III, 5.1, CL Book II.C.6.6.1

9. Parameters

With parameters, there are two distinct scenarios because the parameters may be either known (usual) or unknown (unusual).

Known (usual) parameters are characteristic values, which may be values of measurable properties (for example the melting point of a substance or the electrical resistance of a conductor). Parameters can also be mathematical combinations of variables in a formula (for example Einstein's mass/energy equivalence equation or the Nernst equation). Parameters are often used to define essential technical features of inventions.

Unusual parameters (for example the Hansen solubility parameter) can only be allowed if the skilled person can perform tests, establish the meaning of the parameter and make comparisons with the prior art. Insufficiency of disclosure arises if the parameter is so ill defined that the skilled person, reading the whole disclosure and using their common general knowledge, is unable to identify without undue burden the technical measures (for example selecting suitable compounds) necessary to solve the problem.

Examples

Example parameters: melting point, impedance, electrical resistance, Nernst equation, Hansen solubility parameter.

Legal references:

GL F-III, 11, CL Book II.C.5.5, T 608/07, T 2403/11, T 593/09

10. Beyond the course

You can deepen what you have learned during this course with the following further readings:

- Guidelines for Examination in the EPO, F-III, Sufficiency of disclosure, sections 1 to 12.
- Case Law of the Boards of Appeal of the EPO, II.C. sections 1 to 9.

European Patent Academy
European Patent Office
Munich
Germany

Responsible for the content
European Patent Academy
academy@epo.org