

WIPO Circular C.9199

Contribution of Germany to a compilation of laws and practices relating to the patentability of artificial intelligence (AI)-related inventions (update of document SCP/30/5)

Inventions relating to Artificial Intelligence (AI) (“AI-based inventions”) include both basic AI, i.e. inventions that concern the basic principles (e.g., methods or devices) of AI itself, as well as concrete applications of AI, such as the use of a known AI for a specific field of application.

A. Patentability of AI

To date, there is no established case law in Germany specific to the patentability of AI-related inventions. However, these inventions often show a great proximity to what is known as **computer-implemented inventions**. Thus, the arising questions are of similar nature as those related to so-called computer-implemented inventions. In current examination practice of the German Patent and Trademark Office (DPMA), they are therefore generally addressed applying a **three-stage examination approach** for program-related inventions which was established by the German Federal Court of Justice (BGH) on the basis of Sections 1, 3 and 4 of the German Patent Act. Hereby, the following three questions must be answered step by step:

First stage: Is the claimed subject matter in a field of technology within the meaning of Section 1 Para. 1 of the German Patent Act (technicality requirement)?

This technicality requirement is already met when the subject matter of the invention is at least in part in the technical field. For example, a process representing a mental act or a mathematical method in itself and without any technical reference is excluded from patent protection. However, the technical reference can already be established by including a technical means such as a computer system in the patent claim.

Accordingly, the BGH has ruled out the exclusion of patents pursuant to Section 1 para 3 of the German Patent Act only for programs for data processing systems, but not for devices that make use of electronic data processing. The same applies to the use of mathematical methods, rules or procedures for business activities or the reproduction of information content, so that devices which make use of those are not subject to the exclusion from patentability. Hereby, it is irrelevant whether the invention involves modifications to the mode of operation of the components of the data processing system. [refs: BGH GRUR 2010, 613 - *Dynamische Dokumentengenerierung*; BGH GRUR 2011, 610 - *Webseitenanzeige*; BGH GRUR 2000, 1007 - *Sprachanalyseeinrichtung*; BGH GRUR 2009, 479 - *Steuerungseinrichtung für Untersuchungsmodalitäten*; BGH GRUR 2011, 125 - *Wiedergabe topografischer Informationen*; BGH, 29.11.2016 - X ZR 90/14]

Second stage: Does the claimed object solve a specific technical problem with technical means (Section 1 Para. 3, 4 of the German Patent Act)?

A method fulfilling the above-mentioned technicality requirement does not become patentable simply by the fact that it uses electronic data processing or the use of a program to control a data processing system to achieve the desired result. [ref: BGH GRUR 2002, 143 - *Suche fehlerhafter Zeichenketten*]

In the second stage, it must therefore be addressed whether the claimed object can be regarded as solving a specific technical problem by technical means. The conditions under which this is the case are not conclusively defined either in the German Patent Act or in German case law.

In the context of answering this question, the technical problem itself, which is also relevant for the examination in the third stage, must be determined. The determination of the technical problem underlying a patent or a patent application is part of the interpretation of the patent claim. The technical problem must be developed from what the invention actually accomplishes as compared to the known state-of-the art. [ref: BGH GRUR 2010, 602 - *Gelenkanordnung*]

In that sense, the use of a technical application of an AI process or the explicit consideration of technical conditions in an AI-based process could be deemed to contribute to the solution of a specific technical problem with technical means.

Third stage: Is the claimed solution to the specific technical problem with technical means considered new and based on an inventive step (Sections 3, 4 German Patent Act)?

If a certain feature of the claimed subject matter is not known from the prior art and the claimed invention is therefore considered to be new, it must be examined whether the relevant feature that establishes novelty determines or influences the solution of the specific technical problem by technical means. If this is undoubtedly not the case, this feature must be disregarded in the examination of the inventive step, and it so cannot justify an inventive step even if it is not apparent from the prior art. [refs: BGH GRUR 2011, 125 - *Wiedergabe topografischer Informationen*; BGH GRUR 2011, 610 - *Webseitenanzeige*]

According to the current examination practice of the DPMA, the subject-matter of a patent claim is only patentable if all three above-mentioned stages are affirmed.

B. Sufficiency of disclosure

In certain cases of AI-based inventions, the question of the reproducibility, that is, sufficient disclosure of the invention may also arise.

According to Section 34 para 4 of the German Patent Act, an invention in any technical field must be disclosed in the application in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. In order to fulfill this requirement, the information contained in the patent application must provide a person skilled in the art with sufficient technical information to enable him to successfully carry out the invention using his specialist knowledge and skills.

In the case of inventions in the field of artificial intelligence, the question may arise to what extent an AI algorithm, a training model, a neural network architecture, a machine learning

method, training data or hardware components, etc. must be disclosed in the patent application in order to fulfil the abovementioned requirements. The assessment of sufficiency of disclosure of AI-inventions thus faces new challenges for which no specific national case law has been established to this date.

From a human perspective, machine learning methods are often regarded as "black box" systems because the way in which a certain result is achieved is often difficult to comprehend and explain. On the one hand, this is due to the large amount of data that is processed in a highly complex manner. On the other hand, the gain in knowledge in machine learning procedures essentially arises from statistical correlations rather than logical conclusions. In certain cases, it can therefore be very difficult to rationally explain the result of machine learning procedures in a simple way. Slight changes in the training data used, in the architecture or other mathematical parameters of a machine learning method can bring about different results.

However, in typical practical cases, the inventive idea often does not depend on the exact reaction of the trained system to a certain set of data input values. In other words, usually the skilled person can carry out the invention and reproduce its essential benefits without having the exact same set of training data as the inventor. Also, in examination practice the "black box" phenomenon inherent to many AI algorithms usually does not pose a problem regarding the sufficient disclosure of the invention, namely of the general inventive concept, as long as sufficient details are given about which AI algorithm to use and how to train it.

For assessing the sufficiency of disclosure of an AI-related invention, the circumstances of the individual case are therefore of particular importance.