GJE Intellectual Property

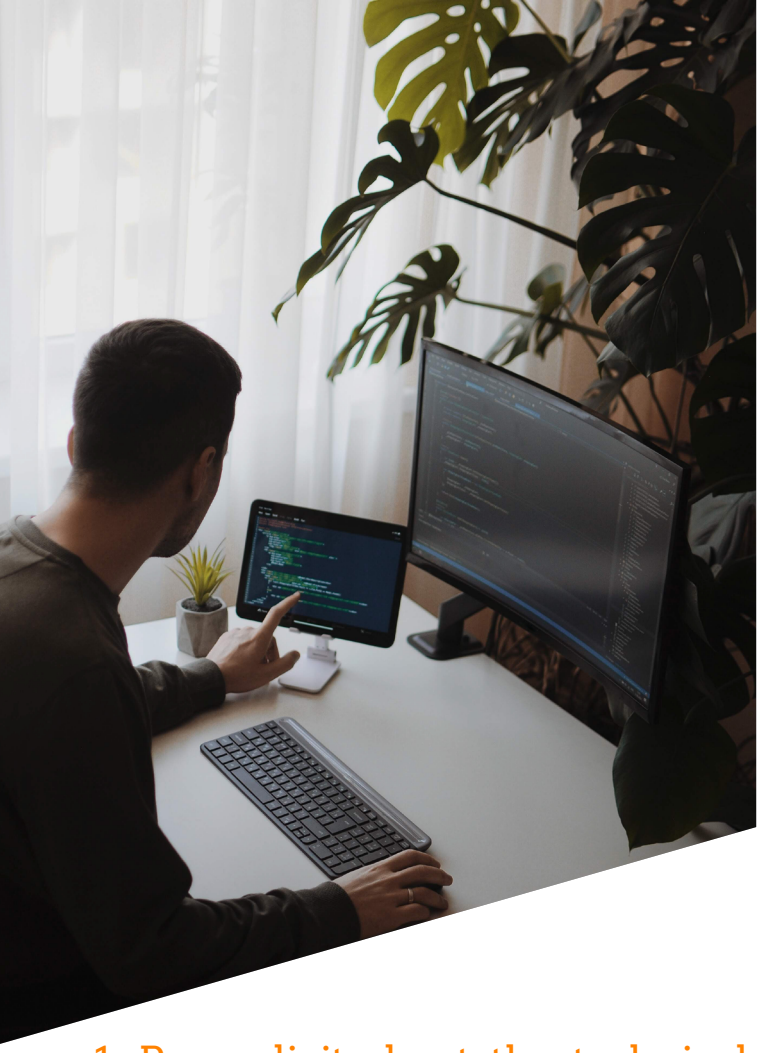
Practical Claim Drafting Tips for Computer Implemented Inventions In View Of G1/19

Introduction

The EPO's Enlarged Board of appeal handed down decision G1/19 on 10 March 2021. This decision concerns the patentability of computer simulations under the European Patent Convention (EPC). While primary applicability of this decision is of course to simulation inventions, the Enlarged Board emphasised in the decision that simulations were not to be treated as a special class of computer-implemented invention. This means that the guidance provided in G1/19 can be generalised to all computer-implemented inventions at the EPO.

In brief, one of the main conclusions of G1/19 is that a simulation *per se* is non-technical and so cannot be the subject of a granted European patent. However, it is possible to get a granted patent that is directed to a use of the simulation where an outcome of the simulation is used in a technical context. For more information on this, see our whitepaper here.

This is all very well in principle, but what does it mean in practice to claim 'the use of an outcome of a simulation in a technical context'? Helpfully the Enlarged Board provided some guidance on this point in G1/19 and, based on this, we have come up with the following tips for claim drafting for computer-implemented inventions.



1. Be explicit about the technical purpose of the simulation when drafting claims

The Enlarged Board made clear that it will not be sufficient to keep a technical purpose of the simulation in the description (or worse, omit it entirely from the specification!). Instead, the technical purpose must be present in the independent claims so that the claims are actually limited to the technical purpose of the simulation. It is permissible for the technical purpose to be implicitly specified in the claim, but in practice it is likely better to explicitly specify the technical purpose so as to avoid any difference of opinion between applicant and examiner.

Those familiar with the EPO's approach to the assessment of machine learning inventions will recognise this principle – see our article here for more information.

Given the strict approach to the assessment of added subject matter that the EPO applies, it will typically be significantly easier to include the technical purpose limitation in the claims from filing, rather than attempt to introduce it during prosecution. Therefore, in the case where claims are being drafted for other jurisdictions where a limitation to the technical purpose is not necessary, it is important to provide support for this limitation to be introduced to the claims during European prosecution. The technical purpose will need to be in the description as originally drafted and preferably also present in any priority document from the outset. Ideally the technical purpose will be clearly disclosed in combination with the subject matter of the claims – the summary of invention is often a good place to include the technical purpose to ensure that this combination is present.

2. Claims can be directed to simulation as part of a process for verifying a design

This point goes directly to one of the formal 'answers' that are the conclusion of G1/19, specifically the answer to question 3 as considered by the Enlarged Board. The answer provided by the Enlarged Board is that claims to a simulation used as part of a process for verifying a design do not need to claim the whole design process to be allowable, assuming of course that they meet all of the other requirements of the EPC.

This is a positive result for applicants as it means that claims do not need to be directed to a physical output of a simulation, i.e. the final design itself. This is of particular consequence to applicants that provide product design services where the applicant likely never produces the final design themselves, for example.

From a claim drafting perspective it is therefore not necessary to restrict independent claims to a manufacturing step. It is advisable to include some information about the manufacturing step in the description, and perhaps direct a second independent claim (possibly in pseudo-dependent form) or a dependent claim to the manufacturing step, to provide support for introducing this into the independent claims should it become necessary (e.g. in jurisdictions other than the EPO).

It is also worth considering whether the final design itself can be separately claimed, i.e. if there is anything novel and inventive about the design per se, unrelated to the fact that the design has been produced using a simulation. In this respect there are parallels with outputs of machine learning algorithms used in fields such as drug discovery and drug repurposing. (For more information on these topics, please contact a member of our chemistry and life sciences team).

3. Describe and claim the simulation in a technical context, not a physical context

G1/19 draws an interesting distinction between 'technical systems' and 'physical systems'. A technical system is one that the skilled person can adjust and improve, whereas a physical system can be modelled to show how it works but cannot be adjusted and improved. The decision provided 'the weather' as an example of a physical system – it can be modelled to show how it works (e.g. weather forecasting) but cannot be adjusted and improved by the skilled person.

In the case of a physical system it is often tempting to focus on precise details of the underlying model – in the case of a weather forecasting simulation, this could be the equations that the simulation uses to describe the interaction between atmospheric particles, for example. The message from G1/19 is that this detail will not itself help to gain the technical character required for patentability. This detail will only be important if it leads to an improvement in the use of the simulation in a technical context.

From a claim drafting perspective it is therefore important to avoid the temptation of restricting claims to details of the underlying simulation, such as equations or boundary conditions, in the case where these details are not relevant to the use of the simulation in a technical context. On the other hand, if it is these details that lead to the technical improvement or advantage, then absolutely focus the independent claims on these details.

4. Broken technical chain

This is not a new concept from the EPO, having already been established by Board of Appeal decision T 1670/07. The essence of the concept is that an advantage or improvement that relies upon a decision being made by a human operator breaks the technical chain between the invention and the advantage or improvement, leading to the advantage or improvement being unavailable for inventive step.

G1/19 considered this decision and commented that "the requirement [of inventive step] is not met if the claimed feature in question contributes to the technical character only for certain specific embodiments of the claimed invention". This tallies with T 1670/07 (Shopping with mobile device/NOKIA) as an improvement or advantage that is contingent on an action performed by a user is only achieved for those

specific embodiments where the user carries out the action necessary to the improvement or advantage to materialise. The Enlarged Board also noted in G1/19 that a weather forecasting simulation that predicted fuel consumption of vehicles would suffer from this problem for the reason that the decision as to whether or not to take a drive on a rainy day depends on subjective user preferences.

In view of this, consider drafting independent claims that exclude embodiments where a user makes a decision based upon an outcome of a simulation. For example, 'automated' embodiments are preferable, where the outcome of a simulation is automatically used in a technical system. In the context of the weather forecasting simulation mentioned above, this could be a step of controlling a shutter for a window based on the predicted weather. If an automated step is not explicitly included in the claim be wary of the repercussive effect of a dependent claim directed to the automated step – this can have the effect of broadening the scope of the independent claim to include a non-automated equivalent to this step. Similarly, a description that is agnostic on this point could allow an examiner to interpret the claim as including both manual and automated embodiments, potentially causing an inventive step argument to fail.

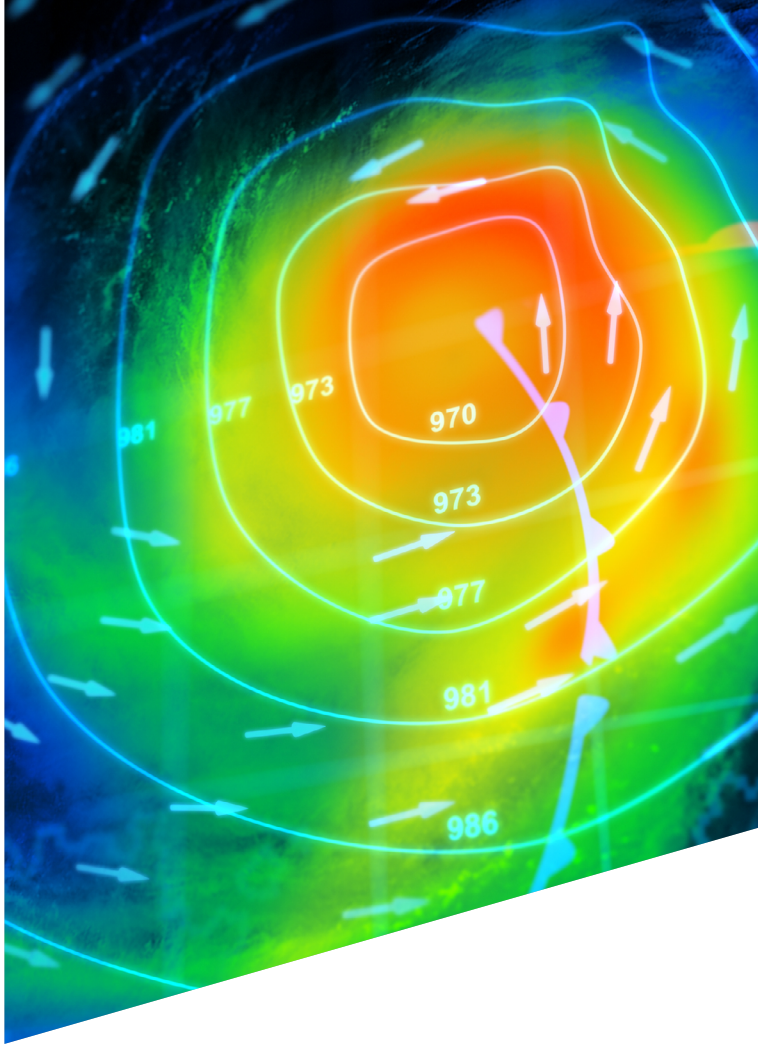
It is of course not possible to include an automated step for all inventions. In the case where user decision making is a key part of the invention, it is perhaps an indicator that a different inventive concept needs to be identified or that a European filing is not appropriate for the invention at hand.

5. Simulated processes are created equal

G1/19 made clear that it does not matter whether the process that is being simulated is technical or non-technical. The technicality, or otherwise, of the underlying process is not brought through to the simulation – instead, all simulations are inherently non-technical.

While this might at first sight seem unhelpful, in fact this is somewhat liberating for the drafter. This is because it is not detrimental to a claim to include references to the simulation of non-technical items or processes. Referring to point 1 above, what will be decisive is whether the claim is directed to an outcome of the simulation being used in a technical context. As long as this is present, the claim should in principle be capable of supporting an inventive step.

It may be that in the case of simulation of non-technical systems, particularly business methods or administrative schemes, it is more difficult (or even impossible) to identify an outcome of the simulation that is being used in a technical context. If this arises it is perhaps best taken as an indication that the invention at hand is not suitable for patent protection at the EPO.



Example – weather forecasting simulation

The principles discussed earlier have been put into action below. Our hypothetical invention here is a weather forecasting simulation, something that was mentioned several times in G1/19. The invention operates by using a new set of equations to model a weather system, with the result that the accuracy of weather forecasts is improved. The inventor proposes to uses the simulation to predict wind strength to enable the blades of a wind turbine to be optimally positioned for upcoming weather.

Two proposed claims to this invention are set out below. Firstly, claim A:

A. A computer-implemented method for producing a weather forecast, comprising:

inputting meteorological data into a computer;

using a weather forecast model to produce a weather forecast based on the meteorological data according to the following equations: <equation details>; and

displaying the weather forecast on a display.

Claim A is neither explicitly nor implicitly limited to use of an outcome of the simulation (the weather forecast) in a technical context. Instead, claim A is directed to simulation of a non-technical physical system. Tips 1 and 3 above are thus not met. Additionally, the outcome of claim A, namely display of the weather forecast, is strongly suggestive of a manual embodiment in which a human operator reviews the weather forecast and makes a decision on whether to adjust the wind turbine blade position or not. The operator may misread the forecast and make a mistake in the blade control, meaning that the technical chain is broken and the improvement relied upon (improved blade control) is not met (Tip 4). Moreover, arguments that in fact automated control is occurring will likely fail as it is difficult to see how display of a weather forecast leads to automated control of a wind turbine blade.

A second claim to this invention, Claim B, is set out directly below:

B. A computer-implemented method for controlling the blade position of a wind turbine comprising a blade controller, the method comprising:

obtaining, by a computer, meteorological data;

using, by the computer, a weather forecast model to produce a weather forecast based on the meteorological data according to the following equations: <equation details>; and

generating, by the computer, a control signal for the blade controller, the control signal based on the weather forecast and the control signal to cause the blade controller to adjust a position of a blade of the wind turbine.

Here, the outcome of the simulation (weather forecast) is used in a technical context as this forecast is used to generate a control signal for the blade controller (Tip 1). The control signal provides technical context for the claim (Tip 3). Notably, claim B still includes details of the weather forecast model as – although non-technical – these details are what lead to the improved weather forecast that in turn results in improved blade control (Tips 3 & 5). Finally, claim B does not involve any decision making by a human operator because the control signal is generated in an automated manner (Tip 4). One could also consider including a step of "transmitting the control signal to the blade controller" to further emphasise this point. It should be kept in mind that it is likely in the applicant's interest to keep the claim restricted to a single party - in the case of claim B, the operator of the computer, so a step of actually controlling the blade position is best kept in a dependent claim at the drafting stage at least.

As can be seen, it is important when drafting an application to a simulation invention to keep the EPO's requirements in mind because it is difficult to fix issues after the application has been filed without running into added subject matter issues. Our computer technology team are always happy to assist with these and other nuances of EPO practice – please see here for our team members.

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