Subject: Amicus Curiae brief regarding G 1/19
Patentability of computer implemented simulations resulting from T 0489/14, EP application no.: 03793825.5

Dear Sirs,

In the above-mentioned decision, the following questions of law have been referred to the Enlarged Board of Appeal:

1. In the assessment of inventive step, can the computer-implemented simulation of a technical system or process solve a technical problem by producing a technical effect which goes beyond the simulation's implementation on a computer, if the computer-implemented simulation is claimed as such?

2. If the answer to the first question is yes, what are the relevant criteria for assessing whether a computer-implemented simulation claimed as such solves a technical problem? In particular, is it a sufficient condition that the simulation is based, at least in part, on technical principles underlying the simulated system or process?

3. What are the answers to the first and second questions if the computer-implemented simulation is claimed as part of a design process, in particular for verifying a design?

Regarding this case, we respectfully observe as follows:
Background

As noted by the referring Board of Appeal,

2. The invention relates to a computer-implemented method, computer program and apparatus for simulating the movement of a pedestrian crowd through an environment.

The published application, on pages 11 to 56, describes a mathematical model of individual pedestrians and an algorithm for simulating their movement through an environment. This is followed, on pages 56 to 70, by the description of a design system which performs the simulation. This system, shown in Figure 21, allows the user to build a model of an environment by creating it or importing a design from a computer-aided-design (CAD) source (page 58, lines 28 to 32). During the execution of the simulation, a sequential set of snapshots is displayed showing the current position of each pedestrian in the modelled environment. These simulation results can be analysed either online, i.e. while the simulation is running, or offline after the simulation has finished and the results have been recorded (page 60, line 18, to page 61, line 5).

The main purpose of the simulation is its use in a process for designing a venue such as a railway station or a stadium, as shown in Figure 22 and described on pages 65 to 70. Essentially, the designer creates or imports an architectural venue design, specifies the constituents of a pedestrian population that is typical for the venue being designed, and performs a number of simulations of pedestrian flows which the designer can specify at a high level (in terms of sources (entrances), sinks (exits) and supply rate). The simulation results are then examined and the design is revised if necessary.

Admissibility

Under Article 112 EPC, a Board of Appeal may submit a question of law to the Enlarged Board of Appeal if it considers that a decision by the Enlarged Board of Appeal is required in order to ensure uniform application of the law, or if a point of law of fundamental importance arises.

That threshold has been met in the present case, as the referring Board of Appeal considers that an Enlarged Board of Appeal decision on whether the reasoning of T 1227/05 is correct would be decisive for its handling of the case, viz. a dismissal of the appeal in case T 1227/05 is incorrect, or a remittal to the Examining Division for a full examination of novelty and inventive step should T 1227/05 have been correctly decided.
General considerations on patentability of technical inventions

In line with Article 27(1) of the WTO-TRIPs Agreement, Article 52(1) EPC provides that

(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.

Article 52(2) lists various types of subjects that are not regarded as inventions within the meaning of Article 52(1) EPC, viz.:

(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.

The emphasis in both above quotes has been added.

Because of the words “in particular”, the list of non-inventions in Article 52(2) EPC is not limiting.

Common to the items listed in Article 52(2) EPC is that the listed items are non-technical, which ensures that Article 52 EPC is compatible with Article 27(1) WTO-TRIPs Agreement.

In line with the basic requirement that only technical inventions can be patented, it follows from Rule 42(1)(c) EPC that an invention is a solution to a technical problem, and it follows from Rule 43(1) EPC that the invention is defined in terms of its technical features.

While it is, as such, relatively easy to ensure that a purported invention meets the basic threshold of Article 52(1,2) that the purported invention is technical (it suffices to state in the claim that the purported invention runs on a technical device like a computer), Article 52(1,2) EPC also has as a consequence that only technical features can contribute to novelty and inventive step. See the discussion in G 3/08, paragraph 10.13, in particular paragraph 10.13.1 and 10.13.2, which refer to T 154/04, Duns. In particular, G 3/08, paragraph 10.13.2, ends by stating

   It would appear that the case law, as summarised in T 154/04, has created a practicable system for delimiting the innovations for which a patent may be granted.

The relevant part of T 154/04 is in paragraph 5 of its Reasons for the decision:

   The constant jurisprudence of the boards of appeal as far as it is relevant to the present case may be summarised succinctly in the following principles:
(a) Article 52(1) EPC sets out four requirements to be fulfilled by a patentable invention: there must be an invention, and if there is an invention, it must satisfy the requirements of novelty, inventive step, and industrial applicability.

(b) Having technical character is an implicit requisite of an "invention" within the meaning of Article 52(1) EPC (requirement of "technicality").

(c) Article 52(2) EPC does not exclude from patentability any subject matter or activity having technical character, even if it is related to the items listed in this provision since these items are only excluded "as such" (Article 52(3) EPC).

(d) The four requirements - invention, novelty, inventive step, and susceptibility of industrial application - are essentially separate and independent criteria of patentability, which may give rise to concurrent objections. Novelty, in particular, is not a requisite of an invention within the meaning of Article 52(1) EPC, but a separate requirement of patentability.

(e) For examining patentability of an invention in respect of a claim, the claim must be construed to determine the technical features of the invention, i.e. the features which contribute to the technical character of the invention.

(f) It is legitimate to have a mix of technical and "non-technical" features appearing in a claim, in which the non-technical features may even form a dominating part of the claimed subject matter. **Novelty and inventive step, however, can be based only on technical features, which thus have to be clearly defined in the claim. Non-technical features, to the extent that they do not interact with the technical subject matter of the claim for solving a technical problem, i.e. non-technical features "as such", do not provide a technical contribution to the prior art and are thus ignored in assessing novelty and inventive step.** *(Emphasis added)*

(g) For the purpose of the problem-and-solution approach, the problem must be a technical problem which the skilled person in the particular technical field might be asked to solve at the relevant priority date. The technical problem may be formulated using an aim to be achieved in a non-technical field, and which is thus not part of the technical contribution provided by the invention to the prior art. This may be done in particular to define a constraint that has to be met (even if the aim stems from an a posteriori knowledge of the invention).

**Considerations relating to simulations**

We believe that T 1227/05 has been correctly decided for the reasons stated in that decision. In short, a simulation of the operation of a technical arrangement like an electronic circuit to study its technical behavior in various circumstances is clearly technical. Its patentability thus cannot be denied straight away as being just a mental activity. Instead, its patentability depends on its novelty and inventive step, which have to be examined in view of the prior art.
To that end, the Board of Appeal in T 1227/05 sent the application back to the examining division.

In contrast, the present case, simulation of pedestrian crowd movement, does not necessarily relate to technical subject-matter.

If the problem to be solved by this purported invention is a commercial problem such as designing the path of shopping public in such a way, that the public is confronted with as many sellable items as possible, then the invention is not technical, just like the purported invention of T 154/04 is not technical.

However, if the problem to be solved by this purported invention is a technical problem such as designing a building, as claimed in the fourth auxiliary request, then the invention is technical and – just like in the case of T 1227/05 - it has yet to be examined whether the purported invention is new and non-obvious.

As to the following considerations of the referring Board of Appeal as mentioned in paragraph 14 of its reasons for its referral decision,

Although the term "environment" is broad, the claim is limited to the simulation of environments through which pedestrians move and which have fixed obstacles. The Board considers that such environments, when they exist in physical reality, are technical and that an environment's "behaviour" when a crowd of pedestrians moves through it, for example the rate at which pedestrians can pass through the environment, is a technical property of the environment, not unlike the ability of a roof to drain rainwater. While it is true that the movement of a pedestrian is determined to a large extent by subjective decisions taken by the pedestrian, ultimately the pedestrian's movement cannot fail to obey the laws of physics: a pedestrian cannot move through a wall or through other pedestrians.

Designing a train station that can handle a million people passing through it per day or a building that can be evacuated within a matter of minutes is primarily the work of an engineer, even if the insights of a behavioural psychologist can be of assistance.

we observe that indeed designing a train station is technical, and that the same holds for designing a building in such a way, that it can be quickly evacuated, but that in contrast, studying whether a flow of people is such that sales are maximized is not technical.

As a result, only the subject of the fourth auxiliary request in this application is technical, so that its patentability depends on its novelty and inventive step, which have yet to be examined in depth in comparison with the prior art, for which purpose the case is to be sent back to the examining division. The other requests in this application do not necessarily relate to a technical solution for a technical problem.
Conclusion

In view of the above, we respectfully suggest that the questions referred by the Board of Appeal should be answered as follows:

1. In the assessment of inventive step, can the computer-implemented simulation of a technical system or process solve a technical problem by producing a technical effect which goes beyond the simulation's implementation on a computer, if the computer-implemented simulation is claimed as such?
   Answer: yes, provided that the claims are indeed limited to a technical solution for a technical problem.

2. If the answer to the first question is yes, what are the relevant criteria for assessing whether a computer-implemented simulation claimed as such solves a technical problem? In particular, is it a sufficient condition that the simulation is based, at least in part, on technical principles underlying the simulated system or process?
   Answer: the relevant criteria are the same as those for other computer-implemented inventions, viz. whether the claimed invention is a technical solution for a technical problem, and whether this technical solution is defined by technical features that result in novelty and inventive step compared to the prior art.

3. What are the answers to the first and second questions if the computer-implemented simulation is claimed as part of a design process, in particular for verifying a design?
   The same.

We hope that the above suggestions are useful.

Yours faithfully,
Philips International B.V.
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L.J. Steenbeek.