

PATENTS ACT 1977

APPLICANT Logined B.V.

ISSUE Whether patent application number
GB0822475.0 complies with Section 1(2)

HEARING OFFICER Peter Slater

DECISION

- 1 Patent application GB0822475.0 entitled “Method including a field management framework for optimization of field development and planning and operation” is derived from the corresponding PCT application filed by Logined on the 11 June 2007 and published as WO2007/143751. The application claims an earliest priority date of 10 June 2006, and was republished on 1 April 2009 with the serial number GB2453280.
- 2 The examiner has maintained throughout the proceedings that the invention as claimed in this application is excluded from patentability as a computer program under section 1(2) of the Patents Act 1977. The applicant has not been able to overcome this objection, despite amendments to the application.
- 3 The matter therefore came before me at a hearing on 24 February 2012 where the applicant was represented by Martin Hyden of Finnegan LLP. The examiner Mr Stephen Jennings was also present.

The Invention

- 4 The invention relates to the management of oil production in an oil-field, and in particular to a so-called “Field Management (FM) system” which can be used to simulate various aspects of the oil field from surface facilities to subsurface structures. This involves the use of various simulators and economic software packages to assist in production of field development, surface facility design, and revenue optimisation amongst other things.
- 5 Traditionally, the Field Management (FM) functionality has been distributed amongst the various subsurface reservoir simulators, surface facility network simulators, and associated controllers which make up the field management system. However, because each separate simulator had its own management functions associated with its proprietary brand, it is often necessary to run

separate field management strategies for every individual subsurface and surface simulator. It was therefore extremely difficult to consolidate the field management strategies from different simulators into a single strategy that could be used to direct drilling activities that optimized the contribution of the drilling activity to all aspects of the reservoir field. It would therefore be desirable to create a field management system to which various proprietary simulators can be coupled and decoupled as and when required so that different field management strategies can be assessed easily without modification of the underlying software.

6 The invention seeks to overcome this problem by making the field management system more modular and flexible. This is achieved by defining a field management “framework” consisting of a series of adaptors and open interfaces which are used to connect various simulators to the field management system in a manner which is independent of their origin, structure or functionality.

7 The most recent set of claims were filed on 14 July 2011 and include two independent claims to a method of reservoir field development (claim 1) and a corresponding system for reservoir field development (claim 6) respectively. The wording of the claims is as follows:

1. *A method of reservoir field development, comprising:*

providing a field management system including:

a portable field management framework;

a plurality of simulators;

one or more adaptors operatively connected to the field management framework; and

one or more open interfaces associated with the one or more adaptors, each having respective interface characteristics;

wherein the field management framework is initially decoupled from any simulators;

modifying one or more of the simulators such that the simulators adhere to the interface characteristics of the open interfaces of the adaptors connected to the field management framework;

in response to the modifying step, coupling the modified simulators to the open interfaces of the adaptors;

obtaining well log output record in response to a well logging operation in a section of the earth formation;

obtaining a reduced seismic data output record in response to a seismic operation in the section of the earth formation;

performing field management on the condition that the modified simulators are coupled to the open interfaces, wherein the step of performing field management comprises obtaining the well log output record and the reduced seismic data output record as input data, and executing a field management strategy in response to the input data; and

drilling an earth formation in response to execution of the field management strategy

6. A system for reservoir field development, comprising:

a field management system including:

a portable field management framework;

a plurality of simulators;

one or more adaptors operatively connected to the field management framework; and

one or more open interfaces associated with the one or more adaptors, each having respective interface characteristics;

wherein, in use, the field management framework is initially decoupled from any simulators;

means for modifying one or more of the simulators such that the simulators adhere to the interface characteristics of the open interfaces of the adaptors connected to the field management framework; and

means for coupling the modified simulators to the open interfaces of the adaptors in response to the modifying step;

means for obtaining well log output record in response to a well logging operation in a section of the earth formation;

means for obtaining a reduced seismic data output record in response to a seismic operation in the section of the earth formation;

means for performing field management on the condition that the modified simulators are coupled to the open interfaces, wherein the step of performing field management comprises obtaining the well log output record and the reduced seismic data output record as input data, and executing a field management strategy in response to the input data; and

means for drilling an earth formation in response to execution of the field management strategy.

The Law

8 The examiner has raised an objection under section 1(2)(c) of the Patents Act 1977 that the invention is not patentable because it relates to a program for a computer as such; the relevant provisions of this section of the Act are shown in bold below:

1(2) It is hereby declared that the following (amongst other things) are not inventions for the purpose of the Act, that is to say, anything which consists of-

(a)

(b)

(c) a scheme, rule, or method for performing a mental act, playing a game or doing business, or **a program for a computer;**

(d)

but the foregoing provisions shall prevent anything from being treated as an invention for the purposes of the Act only to the extent that a patent or application for a patent relates to that thing as such.

- 9 As explained in the notice published by the UK Intellectual Property Office on 8 December 2008¹, the starting point for determining whether an invention falls within the exclusions of section 1(2) is the judgment of the Court of Appeal in *Aerotel/Macrossan*².
- 10 The interpretation of section 1(2) has been considered by the Court of Appeal in *Symbian Ltd's Application*³. *Symbian* arose under the computer program exclusion, but as with its previous decision in *Aerotel*, the Court gave general guidance on section 1(2). Although the Court approached the question of excluded matter primarily on the basis of whether there was a technical contribution, it nevertheless (at paragraph 59) considered its conclusion in the light of the *Aerotel* approach. The Court was quite clear (see paragraphs 8-15) that the structured four-step approach to the question in *Aerotel* was never intended to be a new departure in domestic law; that it remained bound by its previous decisions, particularly *Merrill Lynch*⁴ which rested on whether the contribution was technical; and that any differences in the two approaches should affect neither the applicable principles nor the outcome in any particular case. But the *Symbian* judgment does make it clear, that in deciding whether an invention is excluded, one must ask does it make a technical contribution? If it does then it is not excluded.
- 11 Subject to the clarification provided by *Symbian*, it is therefore still appropriate for me, to proceed on the basis of the four-step approach explained at paragraphs 40-48 of *Aerotel/Macrossan* namely:
- 1) Properly construe the claim
 - 2) Identify the actual contribution (although at the application stage this might have to be the alleged contribution).
 - 3) Ask whether it falls solely within the excluded matter, which (see paragraph 45) is merely an expression of the "as such" qualification of section 1(2).
 - 4) If the third step has not covered it, check whether the actual or alleged contribution is actually technical.
- 12 The operation of this test is explained at paragraphs 40-48 of the decision. Paragraph 43 confirms that identification of the contribution is essentially a matter of determining what it is the inventor has really added to human knowledge, and involves looking at substance, not form. Paragraph 46 explains

¹ <http://www.ipo.gov.uk/pro-types/pro-patent/p-law/p-pn/p-pn-computer.htm>

² *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371; [2007] RPC 7

³ *Symbian Ltd v Comptroller-General of Patents*, [2009] RPC 1

⁴ *Merrill Lynch's Application* [1989] RPC 561

that the fourth step of checking whether the contribution is technical may not be necessary because the third step should have covered the point.

- 13 Mr Hyden accepted that this is the right approach to take.

Construing the claims

- 14 The first step of the test is to construe the claims. I do not think this presents any real problems since both the applicant and the examiner appear to agree as to the meaning of the claims.

Identify the actual contribution

- 15 For the second step, it is necessary to identify the contribution made by the invention. Paragraph 43 of *Aerotel/Macrossan* explains that this is to be determined by asking what it is - as a matter of substance not form - that the invention has really added to human knowledge having regard to the problem to be solved, how the invention works and what its advantages are.

- 16 Mr Hyden's arguments are laid out in part in his letter dated 20 December 2011 where he states the following:

"The invention provides a method of field development by drilling of an earth formation in response to a computer implemented field management strategy which allows the use of a plurality of simulators.

The overall objective of the invention is the efficient extraction of oil and/or gas from underground formations. This can be achieved by the use of existing infrastructure (existing well and surface networks) and/or by the drilling (or re-drilling) of wells to provide new or improved access to the oil or gas.

Drilling of wells is a highly technical activity that must be performed near particular subsurface structures to be effective (see paragraph [184]). Drilling is also complex and expensive (see paragraph [121]) and so only undertaken where other means cannot provide the required effect. The invention allows the effect of drilling at a particular location and in a particular manner to be included in a simulation of the reservoir field behaviour in order that the optimum benefit can be obtained at the reservoir field level.

In order to manage the overall effect, it is necessary to be able to simulate various different parts of the reservoir field, such as the subsurface and surface networks. Prior to the invention, the problem was that each separate simulator had its own management function that was tied to the particular type and structure of the simulator. Effectively it was necessary to run separate field management activities for the subsurface and surface simulators. It was therefore difficult to consolidate the field management strategies from different simulators into a single strategy that could be used to direct drilling activities that optimized the contribution of the drilling activity to all aspects of the reservoir field.

The contribution of the invention is to provide the field management framework as a separate, portable function, that is not tied to any particular

simulator, and to provide this with adaptors to allow the selected simulators to connect to the field management framework. With the invention, it is possible to simulate the effect of a field management strategy at a number of different levels such that drilling decisions made with a better understanding of their effect on all aspects of the reservoir field.”

- 17 At the hearing, Mr Hyden went further, emphasising the fact that claim 1 now includes the additional steps of obtaining logging data and seismic data from an external source, using that data to execute a field management strategy and drilling an earth formation in response to the execution of that field management strategy. He argues that “*there is a clear nexus between the gathering of data, the analysis by the field management system, and the drilling step*” resulting in better field management and an improved drilling operation.
- 18 However, I am not convinced that it is reasonable to characterise the contribution in this way. There is nothing new in the way the data is gathered, or in the way it is analysed, nor is there anything in the specification to suggest that the field management operation is anything other than conventional, or that the drilling operation is in any way improved as a result of the invention. Therefore, to characterise the invention as a better method of gathering data, analysing data, and drilling an earth formation would be to apportion more weight to the form of the claims than to the substance of the invention as a whole, which in my view would be incorrect.
- 19 In my opinion, the contribution lies in the field of making field management systems more modular and flexible. This is achieved by defining a field management framework consisting of a series of adaptors and open interfaces, all of which are implemented in software, which are then used to connect the various simulators to the field management system in a manner which is independent of their origin, structure or functionality.

Does the contribution fall solely within excluded subject matter? Is the contribution technical in nature?

- 20 There is no doubt in my mind that the contribution requires a computer program for its implementation. However, the mere fact that the invention is effected in software does not mean that it should be immediately excluded as a computer program as such. What matters is whether or not the program provides a technical contribution.
- 21 Mr Hyden argues that the contribution relates to a method of reservoir field development involving the drilling of an earth formation which is a highly technical process requiring an assessment of such things as drill location and trajectory, and as such amounts to more than a computer program. His arguments are again laid out fully in his letter dated 20 December 2011 where he states as follows

“Applying the logic of the judgment in Halliburton⁵ (para 71), this question can be re-phrased as, ‘Is it more than a computer program as such?’As in

⁵ *Halliburton Energy Services Inc’s Applications* [2011] EWHC 2508 (Pat)

Halliburton, the conclusion must be that it is, the invention being a method of reservoir field development that includes drilling the earth formation. The output of the method includes instructions as to where and how to drill the formations. These are clearly outputs that go beyond the mere operation of a computer program. The outputs are a new set of instructions that allow the user to drill in a manner that has an effect that is predicted for all aspects of the reservoir field and selected accordingly. In fact, the method of the invention goes even further than Halliburton. In Halliburton, the starting point was a design and the only changes that were made were to the design. At no point did the subject of the method ever become tangible. In this invention, the starting point is real input data (well log output record and reduced seismic data output record necessary for the proper definition of the subsurface structure in question, see para [184]), and simulators of real-existing structures (e.g. subsurface formation, surface networks, etc.). The judgment in Halliburton makes it clear that the technical context of the design data is what takes the invention beyond a computer program as such. In this invention, the data is not only equally technical in nature, but the method involves obtaining real data and simulating a real reservoir field. The invention is therefore clearly more than a computer program as such.

The answer to the third part of the test discussed above effectively answers this point as well. However, for the sake of completeness and paraphrasing para 74 of Halliburton, reservoir field development involving drilling an earth formation is obviously a highly technical process, capable of being applied technically. Reservoir engineers are highly skilled engineers. The detailed problems to be solved with drilling earth formations, such as location, trajectory, etc. are technical problems with technical solutions. Accordingly, finding a better way to develop a reservoir field by drilling earth formations in general is itself a technical problem.”

- 22 Having considered the arguments at some length, irrespective of the form in which the invention is now claimed, I think the contribution, as a matter of substance, lies not in a new method of reservoir field development or an improved drilling operation, for the reasons I have outlined above, but in the use of a field management framework including a series of adaptors and open interfaces to provide a universal interface suitable for coupling/decoupling simulators to the field management system irrespective of their origin, structure or functionality. There is nothing new in terms of hardware. The framework itself, the adaptors and interfaces are themselves pieces of software which couple the simulators to the field management system. There is nothing in the current application to suggest how the program is used to control the drilling operation. In my view, the contribution amounts to nothing more than a computer program as such.
- 23 Furthermore, the problem which the applicant appears to be trying to solve is one of computer programming i.e. providing a field management system to which various proprietary simulators can be coupled and decoupled as required so that different field management strategies can be assessed easily without modification of the underlying software. The invention works by arranging the field management software in the form of an underlying “framework”, to which

simulators can be “attached” according to well defined “open” standards, independent of their origin. The advantages of the invention are in the field of computer programming, in that the field management software is more modular, portable and extensible. The invention does not relate to a technical problem, it is not about improving the gathering of well logging or seismic data, or about analysing that data to reveal improved information about the surveyed region, or about making better decisions on the positioning of well bores. As such I am of the opinion that the claims relate, in substance, to a computer program as such, and can see no technical contribution to save it from exclusion.

- 24 Having considered all the evidence made available to me, and all the arguments put to me at the hearing, I do not consider the invention to provide a technical contribution, and as such it would seem to fall squarely within the computer program exemption of section 1(2)(c).

Conclusion

- 25 In the light of my findings above, I conclude that the invention as claimed is excluded under section 1(2) because it relates to a computer program as such. Having read the specification I do not think that any saving amendment is possible. I therefore refuse the application under section 18(3).

Appeal

- 26 Under the Practice Direction to Part 52 of the Civil Procedure Rules, any appeal must be lodged within 28 days.

PETER SLATER

Deputy Director, acting for the Comptroller