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For Creativity and Innovation

BL O/343/07

20 November 2007

PATENTS ACT 1977

APPLICANT Schlumberger Technology Corporation

ISSUE Whether patent application number GB0510250.4 complies with sections 1(2) and 76(2)

HEARING OFFICER P R Slater

DECISION

Introduction

1 Patent application GB0510250.4 entitled "Method and system for integrated reservoir and surface facility networks simulations" is derived from the corresponding PCT application filed by Schlumberger Technology Corporation on the 23 November 2002 and published as WO2004/049216. The application was then republished on 27 July 2005 as GB2410358.

2 Throughout the examination process, the examiner has reported that the invention is excluded from patentability under section 1(2) of the Patents Act 1977 as it appears to relate to a program for a computer as such. Despite numerous rounds of amendment and re-examination, the applicant and the examiner were unable to resolve this issue. The matter therefore came before me at a hearing on 20 July 2007 where the applicant was represented by Dr Andrew Suckling of Marks and Clerk. Also in attendance were Ms Jennie Salazar of Schlumberger Technology Corporation and the examiner, Mr Ben Widdows.

3 An amended set of claims were filed prior to the hearing on the 19 July 2007 for my consideration which in addition to the patentability issue, raised the question as to whether the proposed amendments were supported by the description or added matter contrary to the requirements of section 76(2)

The application

4 The application relates to the oil industry and in particular to the simulation of oil reservoirs and surface distribution facilities. The invention itself is all to do with the coupling of multiple reservoir and surface facility models, the conversion between different types of model and the exchange of data there between.

5 The application deals specifically with the use of black oil simulators and compositional models. The invention provides not only a new controller for the coupling and synchronizing of multiple simulators but also proposes a new method of converting between black oil and compositional models using, for example, look tables associating well pressure with liquid and vapor component mole fractions.

6 The most recent set of claims were filed on the 19 July 2007, the day before the hearing. There are two independent claims which relate to a method of controlling an oil field (claim 1) and a system for controlling an oil field (claim 8) which read as follows:

"1. A method of controlling an oil field comprising a reservoir and a further reservoir or a reservoir and a network of a surface facility, the method comprising:

establishing communication between a coupling controller and a reservoir simulator, and between the coupling controller and a further reservoir simulator or a network simulator;

using the controller to convert between a set of pseudo-components used by the reservoir simulator and a set of pseudo-components used by the further reservoir simulator or network simulator using a superset of components to delump/lump data therebetween;

harmonizing the simulators by synchronizing the advancement through time of the simulators."

"8. A system for controlling an oil field comprising a reservoir and a further reservoir or a reservoir and a network or a surface facility, the system comprising:

a controller for coupling a reservoir simulator with a further reservoir simulator or a network simulator, the simulators using different sets of pseudo-components, the controller comprising means for converting between the different sets of pseudo-components using a superset of components to delump/lump data therebetween, and means for harmonizing the simulators by synchronizing the advancement through time of the simulators."

7 There are also a number of dependant claims 17-20 which refer to adjusting the production of the oil field and the setting of a choke in the oil field on the basis of the outputs from the simulators.

The Law and its interpretation

8 The examiner has reported that the application is excluded from patentability under section 1(2) of the Act, as relating to a program for a computer as such. The relevant parts of section 1(2) read:

> *1(2) It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of:*
>
> *(a) a discovery, scientific theory or* mathematical method*;*
>
> *(b) a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever;*
>
> *(c) a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer;*
>
> *(d) the presentation of information;*

9 As regards the interpretation of section 1(2), my approach will be governed by the judgment of the Court of Appeal in *Aerotel/Macrossan*[1] and the Practice Notice issued by the Patent Office on 2 November 2006[2]. In Aerotel/Macrossan the court reviewed the case law on the interpretation of section 1(2) and approved a new four-step test for the assessment of patentability, namely:

1) Properly construe the claim

2) Identify the actual contribution

3) Ask whether it falls solely within the excluded matter

4) Check whether the actual contribution is technical in nature.

10 However, the fourth step of checking whether the contribution is technical in nature may not be necessary because the third step – asking whether the contribution is solely of excluded matter – should have covered that point (see paragraphs 45 – 47 of the judgment).

11 Finally, I note that by virtue of section 130(7) of the Act section 1(2) is so framed as to have, as nearly as practicable, the same effects as the corresponding provisions of the European Patent Convention. However, the reliance that I can place on decisions of the Boards of Appeal of the European Patent Office under the corresponding Article 52 of the EPC must now be limited in view of the contradictions in these noted by the Court of Appeal in *Aerotel/Macrossan* and its express refusal to follow EPO practice.

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[1] Aerotel Ltd vs Telco Holdings Ltd & Macrossan's Patent Application [2007] RPC 7

[2] Patents Act 1977: Patentable subject matter [2007] RPC 8

12 As regards added matter, section 76(2) reads:

No amendment of an application for a patent shall be allowed under section 15A(6), 18(3) or 19(1) if it results in the application disclosing matter extending beyond that disclosed in the application as filed.

Arguments and analysis

Added matter

13 It is convenient for me to deal with this point first before moving on to the issue of whether the invention is excluded under section 1(2). At the hearing, I questioned whether the proposed amendments filed on 19 July 2007 were in fact supported by the application as originally filed or whether they constituted added matter contrary to the requirements of section 76(2). That section of course prohibits any amendment that results in an application disclosing matter extending beyond that disclosed in the application as filed. Previously, the claims were directed to a method of controlling the coupling of reservoir and network simulators and a corresponding controller. Claim 1 as amended relates to "*a method of controlling an oil field".* In so doing, the applicant appears to be attempting to show that the method is in some way tied to the controlling of a "real world" physical system and cannot therefore be considered a computer program as such.

14 Dr Suckling considers the amendment justified and to be fully supported by the application as filed. He argues that the skilled man would find it implicit in the disclosure that a reservoir/network simulator of the type described in the present application would be used in making decisions concerning exploitation and production of oil in an oil field. In support of his argument, he drew my attention to the disclosure in *Tingas et al*[3] which appears in the list of references appended to the description, and in particular the opening sentence of the abstract which refers to the "*use of a reservoir and surface network simulation to improve reservoir management"*. He concludes that the skilled person would realise that the simulation is carried out with the purpose of controlling the reservoir system using results from the simulation to adjust, for example, production rates and choke settings. He went on to draw my attention to a number of passages within the specification which refer to, amongst other things, balancing the reservoir models, and calculating and adjusting the pressure drop across a choke e.g. on page 12, and page 17, lines 10 & 27.

15 However, in my view, the application as filed is directed entirely to the modelling of reservoirs and surface facilities per se, and the problems associated with the coupling of different models having different numbers of components. There is nothing to suggest that the results of the simulation(s) are in any way physically linked to the control of elements within an oil field, and whilst that may be the intention it is not brought out in the application. The references to calculating and adjusting the pressure drop across a choke, I think are misleading, and relate to a

[3] Tingas et al "Integrated reservoir and surface network simulation in reservoir management of southern north sea gas reservoirs", SPE Proceedings, 20 October 1998, pages 51-62

"virtual choke" in the network simulator and not to a real world entity as such. I would have to therefore disagree with Mr Suckling, and conclude that there is no support in the application as filed for the proposed amendment which would limit the claims to controlling an oil field and would further point out that there is nothing in the claims themselves to show how the simulation or results therefrom are to be used in the controlling operation. I therefore consider the claims as amended on 19 July 2007 to disclose matter extending beyond that disclosed in the application as filed contrary to the requirements of section 76(2). The only remedy available to the applicant, to overcome this fundamental objection, would be to remove the reference to controlling an oil field from the claims.

16 For reasons that I will explain later, I will now go on to consider whether such a claim is patentable.

Patentability

17 The first step in the *Aerotel/Macrossan* test requires me to construe the claims, or as the Court put it, "to decide what the monopoly is before going on [to] the question of whether it is excluded." Having decided that any amendment restricting the claims to the controlling of an oil field is not allowable, I am essentially left with claims which relate to *a method and/or a system of controlling the coupling of a number of reservoir and/or network simulators using a controller to convert or delump/lump data to be exchanged by the simulators and to synchronise the simulators*.

18 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.

19 Dr Suckling believes the contribution to lie in a new and improved method of controlling an oil field which involves the use of a novel controller for coupling the various simulators used to represent the oil field. However, having said that I do not think there is sufficient to support a claim to a method of controlling an oil field, I would have to disagree.

20 In my opinion, the contribution, as a matter of substance, lies in the use of a controller to exchange data between reservoir and network simulators, to convert the data into the appropriate components and to synchronise the simulators thereby providing flexibility in the choice of software and allowing multiple reservoir simulators to be coupled to a single shared surface network facility simulator.

21 The next step, step 3, is to ask whether the contribution falls solely within the excluded subject matter, which in this case the examiner considers to be a computer program.

22 Dr Suckling's submission at the hearing was that whilst there are many different types of model which can be used to simulate a reservoir, for example, black oil and compositional models, they tend to have different components and require a different number of iterations to complete the simulation, this has meant that in the past it has been difficult to couple simulators, in particular as a result of proprietary software constraints. He says that the controller makes it possible for multiple reservoir simulators using different models to communicate with the network simulator using a common, super-set of components to convert between the pseudo components used by each model. He concludes that the contribution therefore lies in the controller's ability to do just that, to provide a flexible interface between different simulators and the fact that it is implemented on a computer does not make it a computer program as such.

23 Dr Suckling also states in his letter of 19 July 2007, that whilst the simulation process of the invention will in practice be implemented on a computer, it is does not mean that the contribution resides solely in a computer program drawing my attention to the case in *Vicom*[4] and *IBM/Text processing*[5] which states that even if the basic idea underlying an invention might reside in a computer program, a claim directed to its use in the solution of a technical problem does not seek protection for the program as such. Furthermore, he considers the method as claimed to be tied to a technical application in much the same way as was the invention in *Touch Clarity*[6], and that the invention as claimed in claims 17-20 in particular relates to modifying the state of a physical system as was the case in *WesternGeco*[7]*.*

24 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 controlling an oil field, for the reasons I have outlined above, but in the use of a controller to provide an interface between simulators which use different fluid models and representations of data. There is nothing new in terms of hardware, the controller itself is a piece of software which manipulates data, which it then exchanges with the various reservoir simulation models and surface network models, which are in themselves software applications. In contrast to the above cases, to which Dr Suckling refers, there is nothing in the current application to suggest that the program is used to control an actual physical device or process which might otherwise have saved it from exclusion. In my view, the contribution amounts to nothing more than a computer program as such and is therefore excluded.

25 Turning to the remainder of the claims, I do not think that any of the features contained in claims 2-7 and 9-16 provide anything which could form the basis of a patentable invention as the contribution would still seem to fall solely within the meaning of a computer program. Whilst claims 17-20 refer to using the outputs of the simulators to adjust the production of the oil field and the setting of a choke in the oil field, I do not consider these claims to be supported by the description as filed for much the same reasons as I have outlined above. Had the disclosure

[4] T208/84
[5] T115/85
[6] BL O/198/06
[7] BL 0/135/07

been sufficient to support a claim to a method and/or system for controlling an oil field or a choke therein, my conclusion may have been different.

26 Having found the only contribution supported by the application as filed to reside solely in excluded subject matter, I do not now need to consider step 4 of the test.

Conclusion

27 Having found that the proposed claims add matter contrary to section 76(2) of the Act, one would normally give the applicant the opportunity to amend the claims to remove the offending subject matter. However, having read the specification in its entirety, I cannot identify anything that would not otherwise be excluded under section 1(2) of the Act as a computer program. I therefore refuse the application under section 18(3).

Appeal

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

P R SLATER
Deputy Director acting for the Comptroller