Intellectual Property Office

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13 May 2014

PATENTS ACT 1977

APPLICANT Mr Mark Henrik Sandstrom

ISSUE Whether patent application GB 1206535.5 complies with Section 1(2)

HEARING OFFICER Joanne Pullen

DECISION

1 Patent application GB1206535.5 entitled "Maximising Throughput of Multi-user Parallel Data Processing Systems" was filed on 13 April 2012 and claims an earliest priority date of 16 April 2011 from a US application. It was published as GB 2490037 A on 17 October 2012.

2 The examiner has maintained throughout the examination of this application that the claims relate to a program for a computer and a method of doing business and that it therefore falls within the exclusions from patentability of section 1(2) of the Patents Act ("the Act"). Despite amendment of the claims, the applicant has not been able to persuade the examiner that the invention is patentable.

3 On 12 March 2014 the applicant requested a decision to be made based on the papers.

The application

4 The application is one of a number of very similar applications made by the applicant which have much of the specification in common. They all relate generally to the allocation of processing cores of a multi-core computing platform to handle user software applications. The claims of this application are directed specifically to "improving data processing service throughput per a unit cost of the service" by means of a billing assessment algorithm embodied in digital hardware logic, and it is paragraphs 81-91 of the description which are of particular relevance to the claims.

5 The basic equation for performing the billing assessment is given in paragraph 82 as $B = x*CE + y*DBCA$ where B is the billable total, CE is the core entitlement for the user, DBCA is the average amount of cores allocated to the user's program to meet its core demand figure in any given core allocation period, and x and y are billing rates. The specification teaches that this incentivises users to configure their

programs so that they do not automatically make use of the core entitlement but reduce the number of cores used at any one time to the minimum required (in order to minimize DBCA). This enables the utilisation of any particular multi-core computing platform to be maximised.

The claims

6 The most recent claims are those filed on 12 March 2014. Independent claims 1 and 6 read as follows:

> 1. A system for improving data processing service throughput per a unit cost of the service, the system comprising:
>
> digital hardware logic for repeatedly allocating an array of processing cores among software programs of a set of users of the service; and
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> digital hardware logic for assessing billables for the service for a given user of the service on successive billing assessment periods (BAPs),
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> wherein the assessing is done, for any given BAP among the successive BAPs, based at least in part on amounts of cores among said array that the given user i) has an entitlement for, with such an amount referred to as a core entitlement (CE), and ii) got allocated, by the logic for allocating, to meet its demand for cores, with such an amount referred to as a demand based core allocation (DBCA).
>
> 6. In a multi-user data processing platform, a method for improving data processing service throughput per unit cost of the service, the method comprising:
>
> by digital hardware logic, repeatedly allocating an array of processing cores for processing software programs of a set of users of the service; and
>
> by digital hardware logic, assessing billables for the service for a given user of the service on successive billing assessment periods (BAPs),
>
> wherein the assessing is done, for successive BAPS, based at least in part on quantities of cores among said array that the given user i) has an entitlement for and ii) got allocated, by said allocating, to meet its demand for cores.

7 There are also two omnibus claims, numbered 11 and 12 which correspond to a system and method respectively.

The law

8 The examiner has raised objections under section 1(2)(c) of the Act that the invention is not patentable as it relates to both a method of doing business and a program for a computer as such; the relevant provisions 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 purposes 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 In accordance with established case law, the starting point for determining whether an invention falls within the exclusions of section 1(2) is the judgement of the Court of Appeal in *Aerotel/Macrossan*[1].

10 Also of relevance is the decision of the Court of Appeal in *Symbian*[2]. *Symbian* arose under the computer program exclusion, but as with its previous decision in *Aerotel/Macrossan*, the Court gave general guidance on section 1(2). Whilst in the *Symbian* case the Court approached the question of excluded matter primarily on the basis of whether or not there was a technical contribution, it nevertheless (at paragraph 59) considered its conclusion in the light of the *Aerotel/Macrossan* approach. The Court was quite clear (see paragraphs 8-15) that the structured four-step approach of *Aerotel/Macrossan* was not a new departure in domestic law; that it remained bound by its previous decisions, particularly *Merrill Lynch*[3] which rested on whether or not 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* judgement 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 necessary 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) Indentify the actual/alleged contribution.

(3) Ask whether it falls solely within the excluded matter.

(4) If necessary check whether the actual/alleged contribution is actually technical.

Step 1 – Properly construe the claim

12 The applicant has made much in their arguments about the claim language and, in particular, that the claims recite “a system/method for improving data processing service throughput”. The applicant has emphasised this in their submissions of 12 March 2014 stating that the invention “first and foremost results in maximising throughput of multi-user parallel data processing systems”.

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[1] Aerotel Ltd v Telco Holding Ltd and Macrossan’s Application [2006] EWCA Civ 1371; [2007] RPC 7.
[2] Symbian Ltd v Comptroller-General of Patents, [2009] RPC 1.
[3] Merrill Lynch’s Application [1989] RPC 561

13 The examiner has stated in his report of 10 April 2014 that the claims may be construed as written, he has nevertheless identified that there is an issue in relation to how the phrase “for improving data processing service throughput per a unit cost of the service” is construed. The examiner has indicated that the word “for” should be interpreted as “suitable for use” and I generally agree with this assessment as this is in line with our current practice. However, I also need to consider what limitation, if any, this imposes upon the claims.

14 After consideration of the applicant’s submissions and paragraphs 83 and 92 of the description it is clear that the proposed billing assessment algorithm incentivises users to economise the number of processing cores demanded by their programs. It is the uptake of this incentive by users, by reconfiguring their applications, that will consequently result in the data processing throughput per unit cost of the service being improved.

15 I can find no definitive link between the provision of the billing algorithm of the claim and the improved data processing service as there is no absolute requirement for users to modify their behaviour. As there is no guarantee that there is any improvement in the data processing service throughput as a result of implementing this algorithm, the phrase “for improving data processing service throughput” merely represents a desirable, albeit likely, result to be achieved by the system and method of the claims.

16 On this basis I consider that this phrase does not place any limitation on the claim and should not be considered for the purposes of construing the claim. It may however be necessary for me to take account of this aspect when deciding upon the actual contribution in the next step of the *Aerotel/Macrossan* test.

17 The phrases “with such an amount referred to as a core entitlement (CE)” and “with such an amount referred to as a demand based core allocation (DBCA)” can be ignored for the purposes of construing the independent claims.

18 I consider the independent claims are construed as follows:

1. A system comprising:

   digital hardware logic for repeatedly allocating an array of processing cores among software programs of a set of users of the service; and

   digital hardware logic for assessing billables for the service for a given user of the service on successive billing assessment periods (BAPs),

   wherein the assessing is done, for any given BAP among the successive BAPs, based at least in part on amounts of cores among said array that the given user i) has an entitlement for, and ii) got allocated, by the logic for allocating, to meet its demand for cores.
   .

6. In a multi-user data processing platform, a method comprising:

by digital hardware logic, repeatedly allocating an array of processing cores for processing software programs of a set of users of the service; and

by digital hardware logic, assessing billables for the service for a given user of the service on successive billing assessment periods (BAPs),

wherein the assessing is done, for successive BAPS, based at least in part on quantities of cores among said array that the given user i) has an entitlement for and ii) got allocated, by said allocating, to meet its demand for cores.

19 I will construe the omnibus claims narrowly, as I have no reason to do otherwise, and consider that they make the same contribution as the respective main claims.

Step 2 – Identify the actual contribution

20 Paragraph 43 of the *Aerotel/Macrossan* judgement outlines the considerations that must be applied when identifying the contribution. In particular it is necessary to identify what the inventor has really added to human knowledge by considering the problem said to be solved, how the invention works and what its advantages are. This must be done by considering the substance and not the form of the application.

21 The applicant suggests in their letter of 23 October 2012 that the contribution is as follows:

> "A custom hardware logic implemented billing adjustment subsystem/method enabling optimizing data processing service throughput per unit cost on a dynamically allocated multi-user manycore data processing system, wherein said hardware logic implemented adjustment techniques assess billables for a given user of the service on successive billing assessment periods according to amounts of cores that the given user has an entitlement for and got allocated to meet its demand for cores."

22 As I have set out above, I consider that the improvement (or optimisation) in processing throughput per unit cost is the desired result to be achieved. In essence this is the problem being addressed by the invention, i.e. improving/optimising processing throughput in a multi-core computer platform and a proposed solution is to incentivise users to economise the number of cores demanded by modifying the billing assessment. I therefore consider that the proposed solution forms part of the contribution.

23 I have considered both the applicant's submissions and the examiner's comments about the implementation of the invention in hardware. I believe that the custom hardware logic used to implement the invention is merely the replacement of computer software with conventional digital hardware logic, and, as identified by the applicant in their letter of 12 March 2014, such hardware logic would be designed using well known Hardware Description Language code. Thus, whilst the computer program is not in the form of software on a floppy disk, hard disk or a ROM, in substance it is still a computer program. It is of course well known to implement

certain functions of a computer system (such as the multi-core computer platform of which the billing subsystem forms a part) in hardware logic. It is further noted that there is no specific hardware arrangement disclosed in the application. Thus, the fact that the system is embodied in hardware logic is not considered to be a contribution. Also, if it were considered to be a contribution then it would seem possible to circumvent the computer program exclusion simply by claiming any program embodied in hardware logic, which is clearly not the case.

24 This is reinforced by the Court of Appeal in *Gale's Application*[4], finding that a set of instructions embodied in a ROM did not overcome the computer program exclusion, stated:

> "Plainly, however, if the instructions *qua* instructions are not patentable, a claimant's position is not improved by claiming a disc on which those instructions have been recorded or a ROM in which they have been embodied. The disc or ROM is no more than an established type of artefact in which the instructions are physically embedded. It is merely the vehicle used for carrying them.... To decide otherwise would be to exalt form over substance"
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> ...
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> "I approach the substantial issue in this case, therefore, on the footing that it is convenient and right to strip away, as a confusing irrelevance, the fact that the claim is for "hardware". The claim in the specification is, in substance, a claim to a series of instructions which incorporate Mr Gale's improved method of calculating square roots. It is a claim to electronic circuitry in the form of a ROM which is only distinguishable from other electronic circuitry in the form of a ROM by the sequence of instructions it contains. As such those instructions are not patentable, because they constitute a computer program."

25 Equally, I consider that a hardware logic circuit derived by Hardware Description Language code, or any other means, is nothing more than an established artefact operating as the vehicle for carrying the code, and the hardware logic circuit is not therefore a part of the contribution. In *Aerotel/Macrossan* it was expressly stated (at paragraph 73) that standard hardware is not part of the contribution.

26 I consider the contribution is as follows:

> In a dynamically allocated multi-core computer platform service, a computer program which incentivises users to economise the number of cores demanded by means of a billing algorithm which assesses billables for the service for a given user on successive billing assessment periods based on the amount of cores a given user i) has an entitlement for and ii) gets allocated to meet its demand.

<u>Steps 3 & 4 – Does the contribution fall solely within excluded matter and is it actually technical in nature</u>

27 The applicant has submitted in his letter of 12 March 2014 that

> "billing functions are of fully comparable nature to any other integral functional elements of computing service platforms. Each of such functions similarly

[4] Gale's Application [1991] RPC 305

require technical implementations, and that therefore, just because the claims involve utility computing billing functionality which can have a connection to the service providers' business model, the actual claimed invention nevertheless is no technical in nature than e.g. an invention addressing utility computing security challenges."

28 Providing a billing algorithm to influence user behaviour is considered to be solely a method of doing business. The fact that it is part of a computer system does not confer any technical contribution. As was stated in *Halliburton Energy Services*[5]:

> "the business method cases can be tricky to analyse by just asking whether the invention has a technical effect or makes a technical contribution. The reason is that computers are self evidently technical in nature. Thus when a business method is implemented on a computer, the patentee has a rich vein of arguments to deploy in seeking to contend that his invention gives rise to a technical effect or makes a technical contribution. For example the computer is said to be a faster, more efficient computerised book keeper than before and surely, says the patentee, that is a technical effect or technical advance. And so it is, in a way, but the law has resolutely sought to hold the line at excluding such things from patents."

29 Also, as stated in Raytheon[6] (paragraph 34), where a contribution falls solely within two or more exclusions, the invention is still excluded.

30 For completeness I have considered the signposts in *AT&T/CVON*[7] as amended by *HTC v Apple*[8]. The signposts are:

i) Whether the claimed technical effect has a technical effect on a process which is carried on outside the computer.

ii) Whether the claimed technical effect operates at the level of the architecture of the computer; that is to say whether the effect is produced irrespective of the data being processed or the application being run.

iii) Whether the claimed technical effect results in the computer being made to operate in a new way.

iv) Whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer.

v) Whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.

31 I do not find the signposts to be particularly useful in this case. The applicant has not addressed the signposts directly but, in relation to signpost (iv), the applicant has put forward a considerable body of argument relating to the fact that the computer operates more efficiently and effectively both as a result of using hardware logic rather than software and as a result of the new billing algorithm.

32 Whilst the computer system may run faster and provide improved granularity in relation to the billing periods as a consequence of implementing the program on

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[5] Halliburton Energy Services Inc's Application [2012] RPC 129.
[6] Raytheon Company v Comptroller General of Patents [2007] EWHC 1230 (Pat).
[7] AT&T Knowledge Ventures/Cvon Innovations v Comptroller General of Patents [200] EWHC 343 (Pat).
[8] HTC v Apple [2013] EWCA Civ 451.

dedicated hardware logic rather than running it as a software program, this is simply a consequence of the choice of the form that the program takes. There is also nothing in the claims that requires improved granularity. Better granularity does not contribute to the solution to the problem being addressed.

33 The computer service is also said to run more efficiently as a consequence of the invention and this is the perceived problem which is addressed by signpost (v). In fact, it is not the applicant's program which causes the computer service to run more efficiently; the computer service runs more efficiently as a consequence of improvements made to user programs in order to take advantage of the new billing system. Thus the problem is not overcome but circumvented. Although the applicant asserts that "the invention first and foremost results in maximizing throughput of multi-user parallel data processing" this is not achieved by the applicant's method in itself. The method does not directly change the efficiency of the computer service, it is the change in the customer behaviour that achieves it.

34 The applicant also contends, in a number of his letters, that the actual technical nature of his invention can be seen from the "volume and level of detail of the technical diagrams". In particular he has drawn my attention to figures 3 and 8 and paragraphs 30-32, 58-72 and 81-91 of the specification. However technical the description and drawings are, I consider the contribution to be still nothing more than a business method implemented via a computer program as such.

Conclusion

35 I conclude that the invention as claimed is excluded under section 1(2)(c) as it relates to a method of doing business implemented via a program for a computer as such.

36 I therefore refuse the application under Section 18(3).

Appeal

37 Any appeal must be lodged within 28 days

JOANNE PULLEN

Deputy Director, acting for the Comptroller