

09 November 2011

**PATENTS ACT 1977**

APPLICANT                      Forensic Science Service Limited

ISSUE                          Whether application GB0812901.7 is excluded from  
patentability under section 1(2)

HEARING OFFICER              Ben Micklewright

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**DECISION****Introduction**

- 1 International patent application PCT/GB2007/000365 was filed on 2 February 2007 with a declared priority date of 2 February 2006 in the name of Forensic Science Service Limited. It was published as WO 2007/008378 A1 and then entered the GB national phase as patent application GB 0812901.7, republished as GB2448092 A.
- 2 The examiner contended that the claimed invention was excluded from patentability as a program for a computer as such. The applicant disagreed and the matter therefore came before me at a hearing on 14 September 2011 at which the applicant was represented by patent attorney Mr Neil Pawlyn of the firm Urquhart-Dykes & Lord LLP. The examiner, Mr Jim Calvert, a specialist in database technology, also attended, as did Dr Jeremy Kaye, an examiner specialising in biotechnology who had advised Mr Calvert in relation to this case.

**The invention**

- 3 The invention relates to DNA profile matching. A search profile is generated by analysing a sample containing DNA to identify two or more allele identities for each of one or more loci. A database of stored DNA profiles is then searched to identify matches with this search profile. There are however limitations in the accuracy of the generated search profile. The data can be an inaccurate or incomplete representation of the actual genotype of the DNA's source. Prior art techniques for searching the database have their problems. One approach is to search for specific allele identities at a particular locus. This however could result in false matches and in a failure to find an actual match. Another approach is to not specify in the search profile one or more of the alleles but leave these as wild cards in the search. This however results in large numbers of false matches which must be sifted through to find accurate matches.

4 In the present invention a “fuzzy searching” technique is used whereby instead of all the allele identities having either a single value or being used as a wild card, at least one of the allele identities is given a limited range of values in the search profile in order to find matches which fall within that range.

5 The claims before me at the hearing include a single independent claim, claim 1, which reads:

1. *A method of searching a computer database containing a plurality of stored DNA profiles, the method comprising:*

*obtaining one or more of search profiles by analysing a DNA containing sample and then generating a search profile, the search profile being formed of two or more allele identities for each of one or more loci, the allele identities having one of a value or a limited range of values or any value, wherein at least one of the allele identities has a limited range of values;*

*accessing one or more of the stored DNA profiles from the computer database, the stored DNA profiles having two or more allele identities for each of one or more loci, the allele identities having one of a value or a range of values or any value;*

*comparing, using a computer implemented method, the search profile against the one or more stored DNA profiles;*

*establishing that the search profile matches a stored DNA profile when, in respect of a locus, the allele identities of the search profile correspond to or fall within the values for the allele identities for that locus of the stored DNA profile;*

*outputting a data set, the data set indicating those of the stored DNA profiles established as matching the search profile.*

## **The law**

6 Section 1(1)(d) of the Patents Act 1977 (“the Act”) states that a patent may be granted only for an invention in respect of which the grant of a patent for it is not excluded by subsections (2) and (3) or section 4A. Section 1(2)(c) states that things which consist of “a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer” are not inventions for the purposes of the Act, but only to the extent that a patent or application for a patent relates to that thing as such.

7 There is a large amount of case law in relation to these provisions. The most significant recent judgments of the Court of Appeal on the matter are *Aerotel Ltd v Telco Holdings Ltd Ors Rev 1* [2007] RPC 7 and *Symbian Ltd’s Application* [2009] RPC 1. In *Aerotel* the Court of Appeal reviewed all the previous case law and specified the following four-step test as a methodology of determining whether an invention was excluded from patentability under section 1(1)(d):

(1) Properly construe the claim;

- (2) identify the actual contribution;
- (3) ask whether it falls solely within the excluded subject matter;
- (4) check whether the actual or alleged contribution is actually technical in nature.

8 In *Symbian* the Court of Appeal confirmed that the above test is intended to be equivalent to the prior case law test of “technical contribution”. In the present case I will therefore use the *Aerotel* test and ensure in my consideration of steps (3) and (4) that I determine whether the invention makes a technical contribution.

### **Assessment**

#### *(1) Properly construe the claim*

9 The claim is straightforward to construe and no issues of construction arose between the examiner and the Mr Pawlyn.

#### *(2) Identify the actual contribution*

10 The key difference between Mr Pawlyn and the examiner arose in relation to this step, and this step will be key in determining whether the claimed invention is excluded from patentability.

11 Mr Pawlyn emphasised at the hearing that the so-called “contribution approach”, where the question to be answered is whether the inventive step resides *only* in the contribution of excluded matter, should not be used because the Court of Appeal in *Aerotel* said that this approach was wrong. I agree with Mr Pawlyn. Jacob LJ gave the following guidance in paragraph 43 of his judgment in *Aerotel*:

*43. The second step – identify the contribution - is said to be more problematical. How do you assess the contribution? Mr Birss submits the test is workable – it is an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are. What has the inventor really added to human knowledge perhaps best sums up the exercise. The formulation involves looking at substance not form – which is surely what the legislator intended.*

What I therefore have to decide is what in essence the inventor has really added to human knowledge.

12 At the hearing Mr Pawlyn said that in his view the contribution was “an improved method of determining whether the DNA in a biological sample matches one or more of a series of stored samples”. This is similar to an earlier statement of the contribution with which the examiner agreed.

13 The key difference of opinion is however whether the step of “obtaining one or more of search profiles by analysing a DNA containing sample and then generating a search profile” should be included as part of this contribution. Mr Pawlyn insists that it should. The examiner disagrees.

- 14 Mr Pawlyn referred to the following Office decisions during his submissions which related to so-called “tethering” claims (that is, where an invention which may otherwise be excluded from patentability is “tethered” to a real-world effect): *Waters Investment Ltd* (BL/O/146/07), *WesternGeco Limited* (BL/O/135/07), *Forensic Science Service Limited* (O/117/10) and *The Court of Edinburgh Napier University* (BL/O/161/11).
- 15 *Waters* is the case which has the greatest similarity to the circumstances of the present case, and Mr Pawlyn focussed on this case in his submissions. In *Waters* the claim related to a method of analysing the characteristic of samples which are subject to chromatographic and spectrometric analysis techniques. The claimed invention included various aspects of manipulating data sets and carrying out statistical analysis which formed part of the analysis of two or more samples, and also included a step of “subjecting each sample to successive chromatographic and spectrometric analytical techniques” to generate the data sets, a step which was not in itself new. The hearing officer concluded that the claimed invention included steps which were not excluded and that, although these steps were not themselves new, when viewed as a whole what the inventors had contributed was a better way of analysing samples so that significant events in a mass of complex data could be identified more easily.
- 16 Mr Pawlyn highlighted the similarities between this case and the present claimed invention. Both claims are similar in that they include a non-excluded step which in itself is not new. The hearing officer in *Waters* found that it related to a better way of analysing samples and thus was non-excluded. It does not however necessarily follow that the contribution in the present case also relates to non-excluded subject matter. Each case must be judged on its merits, and I have to decide what in the present case the inventor has really added to human knowledge.
- 17 In *Waters* the claimed invention relates entirely to a method for analysing the characteristics of two or more samples (e.g. urine samples of rats) so as to facilitate identification of time locations where the samples are different. The first step of the method related to the conventional step of subjecting each sample to successive chromatographic and spectrometric analytical techniques to generate a data set for each sample. Subsequent steps related to various data processing and statistical analysis steps which enable time locations at which the analysed characteristics of each of the samples differ to be readily identifiable. Each of these steps contributes to the analysis of the sample. The data processing steps and statistical analysis are steps in the analysis of the sample so as to achieve this result, as does the physical analysis step. What the invention relates to as a whole is an improved method of analysis of samples which enables 3-D data generated by the chromatographic and spectrometric analysis to be analysed. Thus a better analysis of the physical samples results.
- 18 The present case is not in my view of the same nature. In the present case, the invention relates to matching up a DNA search profile with one or more profiles from a database of stored profiles. The search profile is generated by analysing a DNA containing sample, but the claim as a whole is not about analysis of the sample. No further characteristics of the sample are identified as a result of the subsequent steps of the claim. Rather the whole claim relates to determining whether there is a match between the profile arising from the analysed sample and one or more of the

stored samples in the database. I do not therefore consider that *Waters* helps me in deciding whether the invention claimed in claim 1 of the present application is excluded. Neither in my view do the other cases referred to above, whose circumstance are further removed from the present case. I have to consider the present invention on its own terms in order to identify what the inventor has really added to human knowledge and to determine whether that contribution lies solely in the excluded fields.

19 Mr Pawlyn emphasised at the hearing that the source of the problem lies in the analysis of the sample and the generation of the search profile and this step should therefore be considered part of the contribution. The problem the skilled person is interested in, he argued, is matching the sample to the stored profiles in the database. This problem does not start with the data processing but originates in the initial analysis of the sample. The question being asked is whether this sample in this test tube matches an entry in the database.

20 I am not convinced by these arguments. It seems to me that the problem is actually about how to identify possible matches to a search profile in a database of profiles. This is the problem which is solved by the present invention. Any problem in the accuracy of the generation of the search profile is circumvented by improving the techniques used to identify possible matches. This problem, and the solution identified in claim 1, lies entirely in the data processing field. It seems to me therefore that the contribution made by the invention relates to an improved method of matching a search profile to stored profiles in a database and does not directly involve the generation of that search profile. This is in essence what the inventor has added to human knowledge as a matter of substance.

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

21 Mr Pawlyn commented that the present invention was capable of delivering useful results when compared with the prior art. This may be the case but an invention does not avoid the exclusions merely because it delivers useful results. Many extremely useful inventions are nevertheless excluded from patentability. Rather my task is to determine whether the contribution falls solely within the excluded subject matter or whether it does not do so and makes a technical contribution. The contribution I have identified above lies entirely in the field of data processing. It relates entirely to matching a search profile to stored profiles in a database. This falls squarely within the field of data processing and makes no technical contribution which would take the contribution outside of this excluded field. The contribution therefore relates to a program for a computer as such and falls solely within the excluded subject matter.

*(4) Check whether the actual of alleged contribution is actually technical in nature*

22 I have found that the contribution lies wholly in the data processing field. It makes no contribution outside of this field and there is no technical contribution. The claimed invention is therefore excluded from patentability.

**Proposed amendment**

- 23 At the hearing Mr Pawlyn requested that if I was minded to refuse the claims as they stand then I consider an amendment which would add into claim 1, features from page 4 lines 14-16 of the description, which states:

*“The outputted data set may provide a list of stored DNA profiles established as matching the search profile. The outputted data set may provide a ranked list, with the rank being provided according to a likelihood of the match.”*

- 24 This, Mr Pawlyn argued, was similar to the *WesternGeco* case which the hearing officer allowed on the basis that it produced as its result an improved seismic image which, bearing in mind *Vicom/Computer-related invention* (T208/84) which related to image processing, provided a technical contribution and took the invention outside of the exclusions. The present case is however in my view different. Rather than a technical image all that is output in the present case is a ranked list. A ranked list is not in itself a technical entity but rather a means for presenting information similar to the way a search engine presents its results in an order with the most relevant first. This does not therefore make any contribution outside of the excluded fields and does not make a technical contribution. An amendment along these lines would not therefore save the claim.

### **Conclusion**

- 25 I have found that the contribution lies solely in the excluded fields and does not make a technical contribution. The claimed invention is therefore excluded from patentability under sections 1(1)(d) and 1(2)(c) of the Act. Moreover I cannot identify any amendment, including the amendment proposed by Mr Pawlyn, which would take the contribution outside of the excluded fields. I therefore refuse the application.

### **Appeal**

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

**BEN MICKLEWRIGHT**

Deputy Director, acting for the Comptroller