

**PATENTS ACT 1977**

APPLICANT Fabio Passeti et al

ISSUE Whether patent application number GB0920058.5  
complies with section 1(2)

HEARING OFFICER Ben Micklewright

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**DECISION****Introduction**

- 1 International patent application number PCT/BR2008/000140 was filed on 14<sup>th</sup> May 2008 with a declared priority date of 15<sup>th</sup> May 2007 in the name of Fabio Passeti et al. It was published as WO2008/138087A2 and then entered the national phase as patent application number GB0920058.5 and subsequently republished as GB2462034A.
- 2 The examiner argued that the invention lay entirely in the excluded fields of a program for a computer as such and the presentation of information as such and thus was excluded from patentability. The applicant, represented by Page White & Farrer, disagreed and despite a number of rounds of correspondence between the applicant and the examiner the matter could not be resolved. A hearing was offered but the applicant opted instead for a decision on the basis of the papers.

**Compliance period**

- 3 The compliance period expired on 14<sup>th</sup> May 2012.

**The invention**

- 4 The invention relates to a method of searching one or more computer databases of biological information for use in the diagnosis or prognosis of pathologies. The method involves producing and using a ternary matrix to integrate biological information for efficient searching and retrieval of biological information for display. The ternary matrix uses three different characters (X,Y and Z) to indicate the presence of a biological characteristic within a given exon, the absence of a biological characteristic within a given exon, and the delimitation of respective exons, respectively.

- 5 The latest version of the claims was filed on 12<sup>th</sup> March 2012 and includes only one independent claim:-

*Claim 1:*

*A computer system comprising a memory storing biological information in at least one database, and means implementing a computer program for searching the biological information stored in the at least one database;*

*wherein the computer program is configured to produce and use a ternary matrix as a molecular biological information adapter that integrates the biological information, the computer program being configured such that :*

*the ternary matrix has a size NxM, wherein, N is the number of rows relative to the various molecular elements or characteristics mapped in a given region of sequenced DNA, and M is the number of columns, relative to all consensus exons and consensus introns of a given gene; and*

*each column is attributed a character X, in the presence, or Y, in the absence, in a given molecular element or characteristic, of a sequence relative to a biological information of interest aligned with the established consensus exon, or Z to indicate the beginning and end of a given exon relative to a given molecular element or characteristic, where X, Y and Z are different from one another.*

- 6 Dependant claims 2-6 further define aspects of the data used in the ternary matrix, dependant claim 7 is directed to the applications of the computer system, and claims 8-24 further define steps of displaying information to a user.

7 **The law**

- 8 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 is not excluded by subsections (2) and (3) or section 4(A). Section 1(2)(c) specifies that things which consist of “a scheme, rule or method for performing 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. Similarly section 1(2)(d) specifies that the presentation of information is not an invention for the purposes of the Act to the extent that a patent or application for a patent relates to that thing as such.

- 9 There is a large amount of case law in relation to these provisions. The most significant recent judgements 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.

10 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 that in my consideration of steps (3) and (4) that I determine whether the invention makes a technical contribution.

## **Assessment**

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

- 11 The main claim does not specify any computer hardware features other than a conventional memory and no application other than storing and searching biological information is specified. The characterising features of the invention are the features of the computer program which is configured to produce and use a ternary matrix. The invention also covers presenting information to a user which is specified in dependant claim 8.
- 12 Accordingly, I construe the invention to be:

*A computer system configured to implement a computer program for searching biological information stored in at least one database wherein the computer program is configured to produce and use a ternary matrix as specified by claim 1.*

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

- 13 The examiner identified the actual contribution of claim 1 to be a computer program that produces and uses a ternary matrix for storing biological information where the ternary matrix uses three separate characters to represent biological information, e.g. using “1”, “0” and “|”.
- 14 In response to the examiner’s substantive reports the applicant has also identified the ternary matrix as an essential aspect of the actual contribution and linked it to the advantages and applications of the computer system. For example, the applicant has pointed out that the ternary matrix enables access to genomic, transcriptional and translational data from various databases within a single platform and further allows the data to be viewed in relation to specific exons of DNA. This in turn facilitates the visualisation and searching of the available biological information. The ternary matrix enables a fast inspection of the biological information without the necessity of searching for the positioning of the exon and intron limits in the matrix and thus enables a user to perform a more rapid search of the available biological information. This is achieved by taking the biological data from one or more databases and processing it so that the information relating to the positioning of exons is associated with other biological information within the ternary matrix. Thereby a separate search for exon information is not necessary and the amount of computer processing resources required when using the computing system of the invention is reduced.

The computer system may be used for the diagnosis or prognosis of pathologies although these applications are not specified in the main claim.

15 I agree that it is clear that the ternary matrix facilitates efficient searching of biological information held in one or more databases. Incorporating positional data of exons using a matrix element obviates the need for subsequent searching for these parameters in the one or more databases. Therefore the method of searching using the ternary matrix would be faster than methods which use matrices which do not incorporate exon positional information and where such information is obtained by further searching of the one or more databases.

16 Taking all of this into account, the actual contribution, that is what the inventors have really added to human knowledge, is, in my view, the following:

*A computer program that produces, from one or more databases of biological information, and uses a ternary matrix populated with characters representing biological information using three distinct characters wherein the characters represent biological information including, the presence of a molecular element or characteristic, the absence of a molecular element or characteristic, and exon limit information.*

17 This contribution provides the advantages mentioned above in relation to reduced use of computing resources when using the computer program to search or retrieve biological information.

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

18 The fact that the contribution is a computer program does not mean that is automatically excluded as a program for a computer as such. What matters is whether or not the computer program provides a technical contribution beyond that of a mere program.

19 The applicant maintains that facilitating the searching and display of biological information more rapidly than previously known methods is clearly a technical feature. Moreover, the applicant also argues that the avoidance of a burdensome post-processing step used in conventional systems provides a technical effect. That is, the invention provides an improved data processing algorithm which takes raw data from a database and brings the data into a state in which it can be used for a diagnosis or prognosis in a manner that requires fewer processing steps or less processing resources than in prior systems.

20 I am not convinced by this line of reasoning. It seems to me that what the computer is doing is reformatting the data from the one or more databases so that it is represented in a ternary matrix to effect quicker and more efficient retrieval of information from one or more databases. This improvement is achieved by reorganising the information from the one or more databases using the ternary matrix. The computer at the level of the system architecture is not operating in any new way and the improvement in search speed and information retrieval is achieved entirely via operations conducted by the computer software. The problem overcome lies in the area of retrieving information from computer databases and not in computer architecture.

21 The applicant has also submitted that the invention is encompassed by “signpost 1” of and *CVON AT&T Knowledge Ventures’ Application Innovations Ltd’s Application* [2009] FSR 19. The applicant has not submitted any arguments in relation to the other signposts but for completeness I shall consider them each in turn.

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

22 The applicant argues that the use of the ternary matrix in facilitating the visualization of available biological information and in enabling a user to perform a more rapid search of the available biological information constitutes a technical effect carried on outside the computer. However, it is clear to me that the data processing performed by the computer program which produces search results more quickly is conducted wholly within the computer system. I am not convinced that the advantage of more rapid visualization of the retrieved data is of any relevance as the contribution lies in the program itself rather than the result of the running the program which is ultimately the display of the results of the search.

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

23 The computer program operates solely on the information held in the databases to produce a ternary matrix which is in turn used for searching. The program has no effect on the operation of the computer system itself or on other programs which may be running on the computer system and does not affect the architecture of the computer system.

*iii) Whether the claimed technical effect results in the computer operating in a new way.*

24 It seems to me that the when the computer program is running the computer is operating entirely conventionally when generating and using the ternary matrix to achieve more rapid retrieval of biological information.

*iv) Whether there is an increase in the speed or reliability of the computer*

25 Any increase in speed is at the level of the database search and there is no evidence that the computer itself is operating faster or with greater reliability.

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

26 The problem of slow access to one or more databases is circumvented by the creation and use of the ternary matrix. The improvement in faster retrieval of biological information is achieved by reducing the amount of data to be searched, by means of the ternary matrix, rather than by increasing the speed of the computer itself. If any problem is overcome, it is a problem in accessing large databases and not a problem with the computer itself.

27 To summarise; the contribution is a better way of retrieving biological information from one or more databases. I can see no technical effect outside of the computer

and the computer is not operating in any new way. The contribution does not create a better computer rather it creates a better way of accessing information held in one or more databases.

- 28 Taking all of these factors into consideration, I conclude that the contribution is a program for a computer. It does not make a computer run faster or more reliably in a more general sense, and so is distinguished from the circumstances of *Symbian*. Nor is there any technical effect outside of the computer system or at the architecture level of the computer. The invention makes no technical contribution and lies wholly within an excluded field and is therefore excluded from patentability. Furthermore I have considered the dependent claims and conclude that none of these claims include features which would impart a technical contribution to the invention. In particular claims 8-24 relate to the display of information and fall entirely within the excluded fields of the presentation of information exclusion as such and a program for a computer as such. These claims add no technical features to the contribution made by claim 1.

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

- 29 As reasoned above, the contribution is not technical in nature but relates solely to excluded subject matter. The application thus fails the fourth *Aerotel* step.

**Conclusion**

- 30 I have found that the invention lies solely in the excluded field of a program for a computer and the presentation of information. I have examined the application and cannot identify any amendment which would result in a patentable claim. I therefore refuse the application.

**Appeal**

- 31 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