PATENTS ACT 1977

APPLICANT   Canon Kabushiki Kaisha

ISSUE   Whether patent application number GB
0219156.7 complies with section 1(2)

HEARING OFFICER   R C Kennell

DECISION

Introduction

1   Application no GB 0219156.7 was filed on 16 August 2002 (no earlier priority
was claimed) and published under serial no. GB 2391967 A on 18 February
2004. The examiner has maintained an objection that the invention is
excluded from patentability under section 1(2) of the Act, which the applicant
has not been able to overcome despite amendment of the specification. I am
deciding the matter on the basis of the papers on file at the request of the
applicant.

2   There have been a number of rounds of examination and response, and the
latest amendments to the claims were filed on 1 September 2006. However,
on 27 October 2006 the Court of Appeal handed down its judgment in the
matters of *Aerotel Ltd v Telco Holdings Ltd* and *Macrossan's Application* [2006]
EWCA Civ 1371 (hereinafter "*Aerotel/Macrossan*") approving a new test for
patentability (explained further below). In a letter dated 8 November 2006, the
examiner re-stated the objection under section 1(2) on the basis of
Aerotel/Macrossan and gave the applicant an opportunity to make further
submissions, to which the applicant has not replied.

The invention and the prior art

3   The invention relates to the classification or indexing of items of information.
As appears from the introductory part of the specification, it is a refinement of a
technique developed by Thomas Hofmann for representing the relationships
between pairs of objects, particularly documents and the terms within them,
called probabilistic latent semantic analysis (PLSA). PLSA allows the
probability of a term occurring within a document to be evaluated by means of
latent or hidden factors that can be extracted from a set of documents and
used to represent the content of the documents and the meaning of terms, so
forming the basis for an information retrieval system. The difficulty remains

that the relationship between documents and the terms within them is complicated by many terms describing similar things (synonyms), whereby two documents can be strongly related but have few terms in common, and by terms having more than one meaning (polysemy) whereby documents containing the same term may turn out to be completely unrelated. The invention allows the user to overcome this problem by supplying prior information in order to cluster and extract well-defined topics.

4   The nature of the invention appears from the abstract accompanying the published application:

> "Information analysing apparatus is described for clustering information elements in items of information into groups of related information elements. The apparatus has an expected probability calculator, a model parameter updater and an end point determiner for iteratively calculating expected probabilities using first, second and third model parameters representing probability distributions for the groups, for the elements and for the items, updating the model parameters in accordance with the calculated expected probabilities and count data representing the number of occurrences of elements in each item of information until a likelihood calculated by the end point determiner meets a given criterion.
>
> The apparatus includes a user input that enables a user to input prior information relating to the relationship between at least some of the groups and at least some of the elements. At least one of the expected probability calculator, the model parameter updater and the likelihood calculator is arranged to use prior data derived from the user input prior information in its calculation. In one example, the expected probability calculator uses the prior data in the calculation of the expected probabilities and in another example, the count data used by the model parameter updater and the likelihood calculator is modified in accordance with the prior data."

5   The claims in their latest form comprise claims 1 – 40 directed to apparatus for generating a text data base, of which claims 1, 7 and 32 are independent, and claims 41 and 42 to a signal and a storage means respectively "for programming processor means to provide apparatus in accordance with any of claims 1 – 40". The independent apparatus claims are lengthy and are in similar terms although not of identical scope; all three specify inter alia a user input means and a clustering means using an iterative technique for recalculating the expected probabilities, updating the model parameters and recalculating the likelihood until it meets a given criterion. The text of claim 1 is appended to this decision by way of illustration.

The law and its interpretation

6   The relevant parts of section 1(2) read (emphasis added):

> "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) … ;

> (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 provision shall prevent anything from being treated as an invention for the purposes of this Act **only to the extent that a patent or application for a patent relates to that thing as such**.";

and the examiner has maintained that the invention is not patentable because it relates to a program for a computer as such, and possibly also to a mathematical method or to a mental act as such.

7   As explained in the notice published by the Patent Office on 2 November 2006[1], the starting point for determining whether an invention falls within the exclusions of section 1(2) is now the judgment of the Court of Appeal in *Aerotel/Macrossan*, although it is not expected that this will fundamentally change the boundary between what is and is not patentable in the UK except possibly for the odd borderline case. 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 (although at the application stage this might have to be the alleged contribution)

   3) Ask whether it falls solely within the excluded matter

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

8   Since it rested on the case law before *Aerotel/Macrossan*, the applicant's arguments in the correspondence relied heavily on the supposed technical contribution made by the invention. The Court of Appeal's comments on this in *Aerotel/Macrossan* must therefore be borne in mind. As stated at paragraphs 45 – 47 of the judgment, reconciling the new test with the earlier judgments of the Court of Appeal in *Merrill Lynch* [1989] RPC 561 and *Fujitsu* [1997] RPC 608, the fourth step of checking whether the contribution is technical may not be necessary because the third step – asking whether the contribution is solely of excluded matter – should have covered the point. Thus, as I explained in my recent decision in *Khan's Application* (BL O/356/06), the presence or otherwise of a technical effect is a subsidiary factor, to be considered only where the invention passes the first three *Aerotel/Macrossan* steps.

9   It therefore seems to me that if the contribution made by the invention, considered as a matter of substance rather than the form of claim (see paragraph 43 of *Aerotel/Macrossan*), consists solely of excluded matter, then the invention will be excluded under section 1(2) and will not be saved by reference to a possible technical effect. I should not now give the applicant

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1 http://www.patent.gov.uk/patent/p-decisionmaking/p-law/p-law-notice/p-law-notice-subjectmatter.htm

benefit of any doubt as to whether the invention arguably covers patentable subject-matter, as paragraph 5 of the judgment makes clear.

10   Nevertheless, it bears emphasising that the exclusion of section 1(2) applies only where the invention relates to excluded matter <u>as such</u>. I must therefore be satisfied that the contribution lies <u>solely</u> in an excluded area before finding against the applicant.

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. I should therefore pay due regard to the decisions of the Boards of Appeal of the European Patent Office under Article 52 of the EPC. However, such decisions do not bind me, and the reliance that I can place on them must now be limited in view of the contradictions in the Boards' decisions highlighted by the Court of Appeal in *Aerotel/Macrossan* and its express refusal to follow EPO practice.

Arguments and analysis

12   In relation to the first *Aerotel/Macrossan* steps, the construction of the claims is not in issue.

13   The second step requires me to identify the contribution made by the invention – what the inventor has really added to human knowledge. Taking the specification at face value, the <u>alleged</u> contribution would appear to be the provision of user input in order to overcome the problems caused by synonyms and by polysemy in the PLSA techniques of information retrieval.

14   However, the closest prior art revealed by the search is specification US 2002/0107853 A1 in the name of Thomas Hofmann, published eight days before the present application was filed (hereinafter this specification is referred to as "Hofmann"). The applicant says that, although both Hofmann and the present invention are concerned with incorporating user preferences into a PLSA technique, Hofmann does it by introducing a new variable which requires a significant number of extra parameters (see paragraphs [0039] – [0040] and [0098] – [0107]). In contrast, the applicant says, the invention does not require any of the original data structures to be changed and does not therefore require a significant amount either of additional memory in order to store extra parameters, or of additional data to estimate such parameters. None of this is in dispute.

15   In the light of this it seems to me that the <u>actual</u> contribution is more properly regarded as the provision of the user input as above, but in a manner which reduces processing complexity and data storage requirements in comparison with the prior art.

16   Turning to the third *Aerotel/Macrossan* step, I now need to decide whether that contribution lies wholly in excluded matter. Claims 1, 7 and 32 do not specify a computer but I think it would be idle to pretend that the invention could be

embodied in any other way. Although the claims are drafted in terms of apparatus, it seems to me that any "hardware" that there might be in the claims is conventional and that, considered as a matter of substance, the invention contributes a set of procedures which enables a computer carry out a PLSA technique incorporating user input to improve the process. I think this applies irrespective of whether I consider the alleged or the actual contribution.

17   Having regard to the decision of the hearing officer in *Oracle Corporation* (BL O/254/05) at paragraph 14, to which the applicant's attention was drawn in the correspondence:

> "…. A flow-chart representing a process to be carried out using a computer would not normally be described as a computer program because it is not in a form that enables it to be executed directly by a computer. But the same could be said of most computer programs written in high-level, or source, languages – ie they need to be converted (eg "compiled") into a low-level, or object, code before they can be executed directly by a computer. On this basis it seems to me that any set of rules or procedures that are intended to be carried out by a computer, howsoever those rules or procedures re defined. ….",

I believe that the set of procedures I have identified constitutes a program for a computer and I cannot see that as a matter of substance the invention contributes anything other than that program. I therefore believe that the invention consists of a computer program as such. (I will leave aside for the moment the question of whether the procedures relate to a mathematical method or a mental act as such.)

18   The invention therefore fails the third *Aerotel/Macrossan* step. There is therefore no need for me go on to the fourth step and consider whether the contribution is technical in nature. Nevertheless, I will comment briefly on the applicant's arguments which were designed to show, in accordance with the case law at the time, that the invention made a technical, and hence patentable, contribution.

19   These arguments appear to me to fall under four main heads:

- (based on *Fujitsu* and *Vicom* (EPO T 208/84)) that a technical contribution arose, not because the information elements were being clustered, but because of the way in which they were being clustered;

- (based on *Inpro Licensing SARL's Patent* [2006] EWHC 70 (Pat), [2006] RPC 20 at paragraphs 186 -187) that the invention produced a technical effect because it would run faster and more efficiently than a computer implementing the system of Hofmann, also that increased speed could constitute a technical effect in view of *Merrill Lynch*;

- (by analogy with *Vicom*) that the claimed invention was concerned with an activity which started in the real world with texts such as documents, carried out physical manipulations of electrical signals representing the text data, and ended in the real world with a database of clustered text; and

- that the invention could not be a computer program as such because as claimed it was concerned, not with how the program would be structured or written, but with what it had to do in practice, ie "the functionality required of the programmed computer to implement the claimed invention"

20 The first three heads all seem to lead back ultimately to the "technical contribution" test in *Vicom*. However, even though the Court of Appeal in *Aerotel/Macrossan* regarded itself as bound by its own precedent (paragraph 38) and *Merrill Lynch* approved the reasoning of the EPO Board in *Vicom*, I do not think that means the authority of *Vicom* survives unscathed. The re-formulation of the Court's earlier approach in *Merrill Lynch* and *Fujitsu* (see paragraphs 41 and 47) emphasises that "a contribution which consists solely of excluded matter will not count as a technical contribution". As is explained at paragraphs 84 – 85 in the analysis of case-law in *Aerotel/Macrossan*, the Court of Appeal in *Merrill Lynch* adopted the "technical contribution" test with the rider that inventive excluded matter could not count as a technical contribution. I do not therefore think that any analogy with *Vicom* can realistically be sustained. With particular regard to the third head of argument, it would in any case seem unwise to hang too much on *Vicom* as a precedent, since, as the Court stated in *Aerotel/Macrossan*, the technical contribution in that case is "somewhat elusive".

21 I do not think it necessary to go over in detail the argument between the examiner and the applicant as to the correct inference to be drawn from Pumfrey J's observation in *Inpro*:

> "186. It is now settled, at least at this level, that the right approach to the exclusions can be stated as follows. Taking the claims correctly construed, what does the claimed invention contribute to the art outside excluded subject matter? …… RIM says that the point does not require elaboration. It contends that all that is claimed, as a matter of substance, is a collection of programs for computers. I think this is wrong. What the claims give is a technical effect: computers running faster and transmitting information more efficiently, albeit ultimately for the purpose of displaying part of that information.
>
> 187. I am anxious that these exclusions are not given too wide a scope. All modern industry depends upon programmed computers, and one must be astute not to defeat patents on the ground that the subject matter is excluded under Article 52 unless the invention lies in excluded subject matter as such."

but I would emphasise, as the examiner did, that Pumfrey J did not actually state that computers <u>operating</u> more efficiently was a technical effect – rather that <u>transmitting information</u> more efficiently was. In *Inpro* the increased efficiency was brought about by the use of a proxy server which enabled a field computer to browse the web with better results than its normal processing and display capacities would suggest, and I would agree with the examiner that *Inpro* is not really comparable to the invention in suit.

22 I am mindful of Pumfrey J's concern in *Inpro* that the patentability exclusions should not be too widely drawn. Nevertheless, where it is alleged that a computer is running faster or more efficiently, I think it is necessary to look carefully at the reason for increased speed or efficiency. In this case, it seems

to me that the computer is operating more efficiently purely because of the way in which it is programmed rather than because (as was the case in *Inpro*) of any improvement in the way in which the computer itself carries out its tasks.

23   In any case the Court of Appeal in *Aerotel/Macrossan* (see paragraph 22) took Pumfrey J's comment not as inclination towards patentability in the case of computer programs, but merely as a sensible warning not to exclude an invention merely because it involved the use of a computer program. In the present case my finding is not based on the use of a computer program but on the program being the sole contribution made by the invention.

24   I do not therefore think that the first three heads of argument now carry any force. Also, the final head of argument is clearly unsustainable. As the examiner pointed out, (i) if it was followed to its logical conclusion all computer programs could be made patentable by enumerating a plurality of method steps rather than reciting a specific data structure, thus elevating form over substance contrary to UK case law; and (ii) if it sufficed for a computer simply to operate differently at a functional level, every new program would have this effect and would be patentable. That cannot be right.

25   It seems to me that *Aerotel/Macrossan* has effectively by-passed the applicant's arguments and I do not in any case see anything in them to persuade me that the contribution made by the invention is anything other than a computer program.

Mathematical method and mental act

26   I accept that the performance of the invention relies on a mathematical method, but I do not think it can be said the contribution lies in a mathematical method as such.

27   As to whether the invention consists of a method for performing a mental act as such, the examiner has noted that *Aerotel/Macrossan* (see paragraph 62) doubts whether the exclusion extends to electronic means of doing what could otherwise have been done mentally, and therefore appears contrary to *Fujitsu*. This point is mentioned in paragraph 13 of the Office's notice. Having already found that the invention consists of a computer program as such, I do not need to decide this point and do not do so.

Conclusion

28   I therefore find that the invention defined in the claims as amended relates to a program for a computer as such and is therefore excluded from patentability under section 1(2). I have read the specification and cannot see that any saving amendment is possible. I therefore refuse the application under section 18(3).

Appeal

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

      R C KENNELL
      Deputy Director acting for the Comptroller

ANNEX TO DECISION O/045/07

Claim 1 as amended on 1 September 2006

Text data base generation apparatus for generating a text data base in which a set of texts is clustered into groups of related texts, the apparatus comprising:
receiving means for receiving texts containing words;
extracting means for extracting words from received texts;
word count determining means for providing count data representing the number of occurrences of different words in each text;
user input means for enabling a user to input prior information relating to the relationship between at least some of the groups and at least some of the words;
clustering means for clustering the texts into groups of related texts, the clustering means comprising
initial model parameter determining means for determining first model parameters representing a group probability distribution for the groups, second model parameters representing, for each word and each group, a group-word probability of that word being associated with that group, and third model parameters representing, for each text and each group, a group-text probability of that text being associated with that group,
prior data determining means for determining from prior information input by a user using the user input means prior probability data for at least some of the second model parameters,
expected probability calculating means for receiving the first, second and third model parameters and the prior probability data and for calculating, for each text and for each word of that text, the expected probability of that text and that word being associated with each group using the first, second and third model parameters and the prior probability data determined by the prior data determining means,
model parameter updating means for updating the first, second and third model parameters in accordance with the expected probabilities calculated by the expected probability calculating means and the count data stored by the count data providing means,
likelihood calculating means for calculating a likelihood on the basis of the expected probabilities and the count data stored by the count data providing means,
control means for causing the expected probability calculating means, the model parameter updating means and the likelihood calculating means to recalculate the expected probabilities using the prior probability data and updated model parameters, to update the model parameters and to recalculate the likelihood, respectively, until the likelihood meets a given criterion, and
output means for outputting the determined first, second and third model parameters at which the likelihood meets the given criterion;
associating means for producing text data base data in which a set of texts is clustered into groups of related texts by associating each text with group data representing the one or more of the groups to which, in accordance with the group probability distribution, group-word probabilities and group-text probabilities represented by the determined first, second and third model parameters, that text should belong; and
a text data base store for storing the text data base data.

R C KENNELL

12 February 2007