

image by identifying regions having a common characteristic e.g. contiguous regions of the same colour. The graphical representations are used to generate a morphological representation of the image in which the sizes, colours and locations of the graphical representations are represented. The morphological representation is used to assign “human readable lexical representations” (i.e. words) representing the sizes, colours and locations of the objects in the image.

- 7 The latest set of claims, which was filed on 4 November 2011 for consideration at the hearing, comprises three independent claims. Claim 1 relates to a method for image database creation and image retrieval, and reads as follows:

A computer implemented method for image database creation and image retrieval comprising:

accessing image data for an image containing objects;

processing the image data by

generating graphical representations of the objects the generating comprising quantizing the image to identify graphical representations having a common characteristic,

determining the centroids(s) and the size(s) of the graphical representation(s),

determining the locations of the centroids(s), and

generating a morphological representation of the image in which the size(s), color(s), and location(s) of the centroids(s), of graphical representation(s) is/are represented;

assigning human readable lexical representations of the location(s) of the centroids(s), the size(s), the color(s) of the graphical representation(s) of the morphological representation; and

storing the assigned human readable lexical representations in a database searchable through a human readable lexicon; and

retrieving an image in response to a search query.

- 8 Note that I have rendered the claim exactly as it appears, including the various references to “centroids(s)”.

- 9 Claims 2 to 8 are dependent on claim 1. Claim 9 is an independent claim to a system for image database creation and image retrieval with features corresponding to the method as claimed. Claims 10 and 11 are dependent on claim 9. Claim 12 is an independent claim to a computer readable storage medium, on which is a computer program implementing the method as claimed.

The law

- 10 Section 1(2) declares that certain things are not inventions for the purposes of the Act, as follows:

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;

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.

- 11 The examiner and the applicant agree that the assessment of patentability under section 1(2) is governed by the judgment of the Court of Appeal in *Aerotel*¹. In this judgment, the court reviewed the case law on the interpretation of section 1(2) and approved a four-step test for the assessment of what is often called “excluded matter”, as follows:

Step one: properly construe the claim

Step two: identify the actual contribution (although at the application stage this might have to be the alleged contribution)

Step three: ask whether it falls solely within the excluded matter

Step four: check whether the actual or alleged contribution is actually technical in nature.

- 12 Subsequently, the Court of Appeal in *Symbian*² made clear that the *Aerotel* test is not intended to provide a departure from the previous requirement set out in case-law, namely that the invention must provide a “technical contribution” if it is not to fall within excluded matter.
- 13 The applicant’s attorneys made various submissions in writing and at the hearing concerning how the *Aerotel* test should be applied to the invention in question, and they also made reference to some other case-law. I consider these points to the extent necessary as a part of my analysis below.

Arguments and analysis

- 14 The examiner maintains that the claims define an invention which consists of no more than a computer program. His position is set out most recently in his examination report of 31 May 2011, and is unchanged following the amendments made to the claims on 1 August and 4 November 2011. The applicant disagrees, with detailed arguments set out in their attorney’s responses of 30 March 2011 and 1 August 2011, and with further arguments set out by the attorneys at the hearing.

¹ *Aerotel Ltd v Telco Holdings Ltd and Macrossan’s Application* [2006] EWCA Civ 1371, [2007] RPC 7

² *Symbian Ltd’s Application* [2008] EWCA Civ 1066, [2009] RPC 1

- 15 What I must do is determine whether the claims, as they now stand, relate solely to excluded subject matter.

Construing the claims

- 16 There was not a great deal of discussion on this point between the examiner and the attorneys prior to the hearing and, although the independent claims contain various terms of the art, in my view there is no great difficulty in construing them in the light of the description. As Mr Pratt confirmed at the hearing, “human readable lexical representations” are simply words that are assigned to features of the images. Mr Pratt also clarified at the hearing that the “graphical representations” are the result of quantising the image to identify the common characteristic (e.g. regions of a single colour), whereas the “morphological representation” is the representation of the image which is generated from the graphical representations in accordance with the steps set out in the claims.
- 17 I am satisfied that the description provides support for Mr Pratt’s construal of these terms, but I note that there appears to be an inconsistency between the terminology used in the claims and the description. The claims refer to a “morphological representation” whereas the description refers to a “morpho-lexical representation” or a “morpho-lexical histogram”. In fact this point was raised as a matter of claim clarity by the examiner in his report of 31 May 2011. On reading the claims in the light of the description, it seems apparent to me that all three terms are intended to refer to the same thing – namely, the representation of the image that is produced as a result of the claimed image processing steps (and in the discussion of an embodiment of the invention, this is the representation shown as 220 in figure 2). Thus I do not think this point materially affects my decision, and for consistency I shall refer to the representation as the “morphological representation” in this decision.
- 18 It follows that the independent claims set out a method or system for image database creation and image retrieval that comprises the steps of accessing image data and then processing that image data by, firstly, generating graphical representations of the objects in the image. That generating step comprises quantising the image to identify graphical representations having a common characteristic. The centroids and sizes of the graphical representations are then determined, along with the location of the centroids, and then a morphological representation of the image is generated in which the location of the centroids and the size and colour of the graphical representations are represented. Words are then assigned to these parameters of the morphological representation and are stored in a word-searchable database, such that an image can be retrieved in response to a search query.

Identifying the contribution

- 19 In paragraph 43 of *Aerotel*, it is made clear that identifying the contribution is probably best summed up as determining what the inventor has really added to human knowledge, and this involves looking at the substance and not the form of the claims (as construed in step one).
- 20 The examiner’s view, set out in paragraph 8 of his report of 31 May 2011, is that

the contribution lies in the quantisation of an image and subsequent derivation of the morphological representation, in order to determine lexical representations of aspects of the image that can then be stored in a searchable database.

- 21 In the event, I do not think that the attorneys' submissions were too far removed from this view. At the hearing, Mr Pratt argued that claim 1 includes technical image processing steps which provide the contribution, and he referred to the two prior art documents that were cited in the International Search Report - US 2002/0081024 (Park) and US 2006/0112088 (Kobayashi). He explained that both documents described the use of colour histograms to associate words with images to allow searching based on colour – and went on to argue that, although Kobayashi mentioned using image features other than colour (e.g. edge information), neither document disclosed the image processing steps set out in claim 1 of the application in suit.
- 22 Therefore, Mr Pratt argued, the contribution to the art was an image processing method which “transforms” an image into a simplified form, thus allowing words to be automatically allocated to the image based on sizes and locations of regions of the image, in addition to colours. In Mr Pratt's view, the combination of image processing steps set out in claim 1 was new and provided a technical contribution. It solved the problem of how to process an image so as to allow words to be assigned to the image to enable better searching using words, and provided a more efficient way to allocate words to images.
- 23 I questioned Mr Pratt on whether the step of actually allocating words to the image formed part of the contribution. His view was that it did not – the crux of his argument seemed to be that the contribution was provided by the technical image processing steps required to transform the image into a morphological representation in order to allow the automatic allocation of words, rather than being provided by the actual step of word allocation itself.
- 24 As Mr Scott rightly emphasised at the hearing, determining the contribution made by the claimed invention is not as simple as slicing the invention up into its component parts and then assessing the novelty or inventiveness of each of those parts. What is required is to assess the contribution made by the claimed invention as a whole, and so the interaction between the various features (known or otherwise) needs to be considered when making that assessment.
- 25 With this in mind, I agree with Mr Pratt's assessment of the contribution. Although certain features of the claimed image processing steps are known in the art in isolation, in my view there is sufficient synergy between the individual image processing steps to regard them as together forming the contribution made by the invention. These image processing steps operate in combination to produce the morphological representation.
- 26 I therefore find that the contribution is defined by the claimed steps of processing image data resulting in the generation of a morphological representation of the image which allows automatic allocation of words representing the colour, size and location of regions of the image.

Does the contribution fall solely within excluded matter?

- 27 As is clear from *Aerotel*, what I must now do is decide whether the contribution relates solely to a computer program which is excluded from patentability under section 1(2).
- 28 The invention is clearly implemented by a computer – claim 1 relates to a computer implemented method and the hardware referred to in claims 9 and 12 is nothing more than conventional. However, as was made clear in *Symbian*, the mere fact that an invention relates to a computer program does not necessarily mean it is excluded from patentability, because a computer program that provides a technical contribution is not regarded as a computer program “as such” and is therefore not excluded under s.1(2).
- 29 Mr Pratt’s main strand of argument was based on *Vicom*³, a decision of the EPO Technical Board of Appeal that was endorsed in *Symbian*.
- 30 In *Vicom*, the Board of Appeal held that a claim directed to a technical process carried out under the control of a computer program is not excluded from patentability as a computer program as such. The claimed method of digitally processing image data was held to be a technical process in which a mathematical method was used (rather than being a claim to a mathematical method as such). This was because the process was carried out on a physical entity (an image stored as an electric signal) by technical means and resulted in a certain change in that entity. Since it was held to be a technical process for these reasons, the claimed method was held to amount to more than a computer program as such.
- 31 Mr Pratt argued that the contribution made by the invention in the present case equally did not fall solely within excluded matter because it included the steps of operating on image data to transform it into a simplified, morphological representation. The invention was therefore on all fours with *Vicom* in that it acted on real world image data to change it in some way. It followed that the invention included technical steps and was not excluded from patentability.
- 32 The examiner’s view, as set out in his report of 31 May 2011 at paragraph 9, is that the contribution falls solely within excluded matter because the steps of quantising the image, deriving the morphological representation and determining words to be allocated to the image are achieved as a result of running a computer program. Thus the contribution is no more than a computer program for determining human readable lexical representations of aspects of an image. Furthermore, at paragraph 17 of his report the examiner contends that the claims at issue in *Vicom* were allowable because the image processing performed was a technical process which related to the technical quality of the image. He goes on to argue that this is not the case in the present application and so the reasoning in *Vicom* does not apply.
- 33 There are clearly differences between the invention in *Vicom* and the invention in this application. As the examiner pointed out, *Vicom* relates to an image

³ *Vicom/Computer-related invention* [1987] 1 OJEP 14 (T208/84)

processing method which produced an image having a better technical quality. In contrast, the present application provides a method of processing an image in order to generate a morphological representation which facilitates the assignment of words to that image, so it does not produce an image which has a better technical quality (although Mr Pratt argued that it is nevertheless a “better image for a different purpose”). However, I do not think these differences necessarily mean that the reasoning in *Vicom* does not apply in assessing whether the contribution made by the invention falls solely within excluded matter.

- 34 The contribution resides in processing real world image data to generate a representation of the image which allows words to be automatically allocated to it. Although this is not processing the image data by applying mathematical techniques in order to get out, at the end, a better quality image, it is processing the image data by applying mathematical techniques in order to achieve a different outcome – namely, a representation of the image which is then suitable for the assignment of words.
- 35 *Vicom* makes clear that processing an image to provide a change in that image is a “technical process”. I have read *Vicom* carefully, and I am not persuaded that this finding is necessarily restricted to the type of image processing where the output is an image of improved quality in some way. In my view the steps contained in the contribution of the present invention, of processing the image to generate a simplified representation which has particular properties suited to the intended use, are technical image processing steps to which the reasoning of *Vicom* may be said to apply. It follows that I find that the contribution relates to a technical process within the meaning of *Vicom*.
- 36 As noted in paragraph 30, *Vicom* says that a claim directed to a technical process carried out under the control of a computer program is not excluded from patentability as a computer program as such. It follows that the claims of the present application are directed to more than a computer program as such, and so do not fall solely within excluded matter.
- 37 As an alternative argument, Mr Pratt submitted that the invention was not excluded because the contribution included the step of determining the sizes, and locations of centroids, of graphical representations. These steps amounted to measurement of “real world” image data and so did not fall solely within excluded matter. Given my conclusion in respect of the *Vicom* argument, I make no finding in respect of this alternative argument.

Is the contribution technical in nature?

- 38 I have already concluded in my consideration of step three that the contribution made by the invention relates to a technical process and so is technical in nature.
- 39 I note that, in his report of 31 May 2011, the examiner considered the five signposts set out in *AT&T/CVON*⁴, which are indicators that a computer program makes a relevant technical contribution that takes it outside of excluded matter. Since I have already concluded that the invention makes a technical contribution

⁴ *AT&T Knowledge Ventures’ Application and CVON Innovations Ltd’s Application* [2009] FSR 19

on the basis of the reasoning in *Vicom*, it seems that I do not need to give further consideration to step four of the *Aerotel* test or, in particular, these signposts.

Conclusion

- 40 I conclude that the invention of independent claims 1, 9 and 12 is not excluded from patentability under section 1(2)(c) insofar as it does not relate solely to a program for a computer.
- 41 The application is remitted to the examiner.

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