



PATENTS ACT 1977

APPLICANT	Adobe Systems Incorporated
ISSUE	Whether applications GB1612864.7 and GB1612865.4 comply with section 1(2)(c)
HEARING OFFICER	Peter Mason

DECISION

Introduction

- 1 The decision relates to patent applications GB1612864.7 and GB1612865.4 entitled “*Searching using specific attributes found in images*” and “*Modifying at least one attribute of an image with at least one attribute extracted from another image*”, respectively. Both applications were as filed on 25th July 2016 in the name of Adobe Systems Incorporated and both claim earlier priority from the same three applications at the USPTO. Aside from the title and two summary paragraphs¹, each shares a substantially identical description. The applications were published on 5th April 2017 as GB2542890 and GB2542891, respectively.
- 2 The applications were considered by the same examiner, who found each invention to be excluded by section 1(2)(c) as computer programs as such. Concluding that searches of either application would serve no useful purpose, on 12th January 2017 the examiner issued reports under section 17(5)(b) alongside abbreviated examination reports under section 18(3).
- 3 Despite several rounds of correspondence, including amendment of the claims, the applicant was unable to convince the examiner that the inventions were patentable. It was agreed the issues should be decided by a hearing officer based on the information already on file. I am grateful to the applicant agreeing the applications should be decided together; this provides for efficient and effective processing and analysis. The compliance dates of both applications have been granted a discretionary extension, which now expires on 30th November 2020.
- 4 The application has not been searched and the examiner has also deferred many aspects of the examination. The only issue for me to decide here is whether the application complies with the requirements of Section 1(2) of The Act. I will set out

¹ Paragraphs 0007 and 0071

some common aspects of the application together with the applicable law. I will then set out my reasoning in respect of GB1612865.4 and follow that with GB1612864.7.

The Inventions

- 5 The background to these inventions sets the scene of two scenarios when searching for images. Typically, images might be searched for using words if they have previously been tagged with descriptive keywords. Alternatively, images can be retrieved by searching for attributes of similar images. Each of these techniques is potentially flawed because of the quality of data available to the search or the general lack of such data (paras 0002-0005). These inventions aim to solve these problems by using machine learning to identify and distinguish image attributes.
- 6 The claims of each application have been amended and the present form of each application's main claims is included in the annexe for convenience.

The Law

- 7 The examiner raised an objection under Section 1(2) of the Act that the invention is not patentable because it relates to one or more categories of excluded matter. The relevant provisions of this section of the Act are shown with added emphasis below:

1(2) It is hereby declared that the following (amongst other things) are not inventions for the purpose 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**.*

- 8 The assessment of patentability under Section 1(2) is governed by the judgment of the Court of Appeal in *Aerotel*², as further interpreted by the Court of Appeal in *Symbian*³. In *Aerotel*², the court reviewed the case law on the interpretation of Section 1(2) and set out a four-step test to decide whether a claimed invention is patentable:

1. Properly construe the claim.

² *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371; [2007] RPC 7

³ *Symbian Ltd v Comptroller-General of Patents*, [2009] RPC 1

2. Identify the actual contribution (although at this stage it is an alleged contribution).

3. Ask whether that contribution falls solely within the excluded matter.

4. If the third step has not covered it, check whether the actual or alleged contribution is actually technical.

9 The Court of Appeal in *Symbian*³ made it clear the four-step test in *Aerote*² was not intended to be a new departure in domestic law; it was confirmed that the test is consistent with the previous requirement set out in case law that the invention must provide a “technical contribution”. Paragraph 46 of *Aerote*² states that applying the fourth step of the test may not be necessary because the third step should have covered the question of whether the contribution is technical in nature. It was further confirmed in *Symbian*³ that the question of whether the invention makes a technical contribution can take place at step 3 or step 4.

10 Lewison J (as he then was) in *AT&T/CVON*⁴ set out five signposts he considered to be helpful when considering whether a computer program makes a technical contribution. In *HTC/Apple*⁵ the signposts were reformulated slightly in light of the decision in *Gemstar*⁶. 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 applications 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.

The impact of HTC/Apple

11 Throughout their correspondence on these applications the applicant has argued the relevance and precedence of the *HTC/Apple*⁵ judgment. *HTC/Apple*⁵ clarifies the meaning of the fourth signpost suggested in *AT&T*⁴, however, I will make this point now and I will refer to it again later, *HTC/Apple*⁵ does not clearly change

⁴ AT&T Knowledge Ventures LP and Cvon Innovations Ltd v Comptroller General of patents [2009] EWHC 343 (Pat)

⁵ HTC Europe Co Ltd v Apple Inc [2013] EWCA Civ 451

⁶ Gemstar–TV Guide International Inc v Virgin Media Limited [2009] EWHC 3068 (Ch), [2010] RPC 10

interpretation or override judgments that went before. What *HTC/Apple*⁵ does, in conjunction with *AT&T*⁴, is to clarify the question that must be asked.

- 12 I will also refer to the judgment in *Autonomy*⁷. The examiner introduced this in the proceedings of GB1612865.4 in their examination report of 28 June 2019, paragraph 7.

Application of the Aerotel approach to GB1612865.4

Step 1: Properly construe the claim

- 13 The examiner and the agent are each content there is no difficulty in understanding the claims. Nonetheless, I think it is worth considering what the main claims encompass, because it will set the scene further on the contribution to the stock of human knowledge.
- 14 It is useful to summarise the invention. The invention is a method using the advantages of computer learning to build knowledge of potential image attributes (*“training a neural network to extract specific attributes from a set of images, wherein different layers of the neural network correspond to different specific attributes”*). It then uses that knowledge to understand which specific attributes are present in a particular image (*“receiving, at the neural network, an image; extracting, by the neural network, attributes from the image”*) so that different attributes can be offered to a user for selection (*“providing a search preview comprising a set of result images, the set of result images being visually similar to the image and comprising at least one result attribute that is different from the attributes extracted from the image; receiving a selection of a result image of the set of the result images”*) in order that the computer can then build a refined search query using that selected attribute (*“initiating a search query based on the selection, and providing refined search results based on the selection”*).
- 15 The claim does not explicitly recite the existence of an image database. Nevertheless, this is implicitly present in the step of training the computer because the computer cannot be trained without a structured collection of data. Furthermore, without collating something analogous to a database of images, there can be no step of providing a search preview. This all matches the application’s background problems which are stated as being either a lack of tagged image text or a lack of image quality (*note paragraph 5 above*).

Step 2: Identify the actual (or alleged) contribution

- 16 There can be no doubt the invention is using standard computing technology. There is no claim to new hardware or any suggestion of a new arrangement of hardware. What the invention is attempting to distinguish is a new computer program with a technical contribution. To that end we must understand what that contribution is.

⁷ *Autonomy Corp Ltd v Comptroller General of Patents, Trade Marks & Designs* [2008] EWCH 146 (Pat)

- 17 The examiner and the applicant have each set out an interpretation of the contribution in respect of the current form of the claims. In their letter of 2 Oct 2017, the applicant presented their view of the contribution as:

... a method for training a neural network such that it can autonomously facilitate the programming of search queries for images similar to, but varying in at least one attribute (i.e. as a result of the refinement selection from a set of result images which have at least one different attribute), from a search image.

- 18 This seems to present a view of the bigger picture of the invention and is a pithy summary of an expectation of the invention pointing towards a problem it addresses. However, the examiner contested that definition, identifying issues with the choice of the terms “autonomously” and “the programming of search queries”. I tend to agree with the examiner on this analysis. That is, while one can envisage the skilled addressee recognising the potential of this disclosure to autonomously facilitate the programming of search queries, I do not see any suggestion within the application that this is specifically foreshadowed.

- 19 Furthermore, there is some discussion to have around the role of the neural network. I note and agree with the examiner’s observations on the significance of the neural network, that from the over-all application the teaching is clear: it is only an example of what may be considered. Even though the applicant has chosen to narrow their definition of what they want protection for to include this aspect, in terms of what the invention is adding to human knowledge, it cannot be important. So, the contribution appears to include training a computer, but the manner in which it is trained is not significant. Merely training a computer to identify attributes within data is quite standard and the agent presents no real challenge to the examiner’s view that there can be no technical effect or contribution coming from the training step per se⁸.

- 20 Turning to the examiner’s view, he has set out the contribution as:

A computer implemented method for facilitating searching using a specific attribute found in an image, training a neural network (or other conventional feature extraction algorithm) to extract attributes from an image; providing a search preview comprising a set of result images, the set of result images being visually similar to the image and comprising at least one result attribute that is different from the attributes extracted from the image; receiving a selection of a result image of the set of result images; initiating a search query based on the selection; and providing refined search results based on the selection.

- 21 In contrast to the applicant’s view, it seems to me the examiner tends to recite the main claim rather than an identifying what might have been contributed to the stock of human knowledge.

- 22 In the absence of agreement over the form of contribution, I must take a step back and review what I understand the contribution to be. To do this, I must use what I

⁸ Presented in the Abbreviated Examination Report of 12/01/2017, paragraph 13

have construed the invention to be in paragraph 15 above together with the spirit of the problems the invention wants to overcome.

- 23 The application acknowledges image databases are very well-known, but the invention is looking to address the lack of good data to search. I think it fair to assume at the point of filing in 2016, or even at the earliest date in 2015, it was already well-known for the skilled person to be applying computer learning to image databases. As such, I do not see the contribution could reside in those elements per se. But I must be careful not to fall into the trap of finely slicing-off features so that I might falsely narrow the contribution. Equally though, I must not merely recite the claim without thinking of the problem.
- 24 The invention looks to address the problem of lack of good data by training a computer to build knowledge of potential image attributes. Although assumed to be known, this is important to the foundation of the alleged contribution. Having learned from the dataset of images, the invention offers similar-but-different images to that required to be searched so that the computer can then again learn which other similar-but-different images to present. And so I think I can best set out the contribution as:

Facilitating searching of a collection of images which do not have relevant data, by using machine learning to build the image data, identifying that image data in an image search sample, offering similar and different data to a user in order that the user select which different data it is they are looking for, and then using the selected different data as part of a refined search query through the database of images.

Steps 3 and 4: Ask whether the contribution falls solely within the excluded subject matter and whether it is technical in nature

- 25 The third and fourth steps of the *Aerote*² test involve considering whether the contribution falls solely within excluded categories, and then checking whether the contribution is technical in nature. It is appropriate to consider these two steps together because whether the contribution is technical in nature will have a direct impact on whether it falls solely within excluded matter.
- 26 Throughout their correspondence, the applicant presents three strands of argument:
- 1) The application is very similar to the Apple invention considered in *HTC/Apple*⁵
 - 2) *HTC/Apple*⁵ is the key precedent case
 - 3) By analogy to the Apple invention, signposts (i), (iv) and (v) point to the invention being technical
- 27 On the first point, in the Apple invention a computer device is programmed at the operating system level so that core interactions with the device's screen may or may not be used by other software on the device⁹. In the present application there is no suggestion whatsoever that the program is applied to the operating system or to

⁹ *HTC/Apple*⁵ paragraphs 23 & 24, for example

control the wider device. I cannot agree that the Apple invention is particularly relevant here beyond the judgment's clarification of the fourth *AT&T*⁴ signpost.

- 28 On the second point, as I say above, *HTC/Apple*⁵ is only relevant inasmuch as it directs us to consider the relevance of the *AT&T*⁴ signposts. The *AT&T*⁴ signposts are themselves only the conflation of earlier judgments into a convenient list and are not exhaustive. To that end, the *HTC/Apple*⁵ judgment provides some examples where the *AT&T*⁴ signposts have been particularly helpful; for example, the reference to *Gemstar*⁶ at paragraph 149.
- 29 On the third point, I will turn to the signposts themselves.
- 30 Regarding the first signpost and whether the claimed technical effect has a technical effect on a process which is carried on outside the computer, it is not clear to me that there are any real effects on processes outside the computer. The image data is wholly held and processed within the computer. The agent has repeatedly presented the argument that the invention makes writing software easier¹⁰ and so is akin to Apple's invention. However, as I say above, Apple's invention was concerned with the operating system and as a result writing all software was potentially easier, impacting as a technical process. Furthermore, the user's interaction with the screen was deemed a technical process outside the computer. Neither of those are relevant here.
- 31 In the present application, the argument is presented that by saving the need to re-write search queries there is analogy with Lord Justice Lewison's comments about making software easier to write¹¹. But isn't this what all programming is doing? Once any program is written it can be referred to again and again. That cannot be what was intended by his comments. Beyond making search queries easier to write, is there any technical process outside the computer? All of the steps of the method take place within the computer. Arguably there might be user interaction before "receiving, at the neural network, an image" and before "receiving a selection of a result image", but I can find nothing to make me think that interaction is a technical process.
- 32 There is no argument that the second signpost is relevant and I agree. I will reiterate once again that the present invention is not operating at the level of architecture of the computer.
- 33 The third signpost is also not relevant.
- 34 I do not see how the fourth signpost can be relevant. The agent's only argument to suggest this signpost is helpful was in their letter of 2 Oct 2017 in respect of being easier to program. This appears to be another attempt to draw analogy with Apple's invention. But as I have said before, there are very clear differences between this application and Apple's.
- 35 Regarding the fifth signpost, once again the applicant argues the *HTC/Apple*⁵ arguments apply here. Their argument is the problem being resolved is the difficulty

¹⁰ Agent's letters of: 2 October 2017, page 3, para 1; 24 September 2019, page 2, para 1; 6 March 2020, para bridging pages 2-3

¹¹ *HTC/Apple*⁵, paragraph 154, in respect of the first signpost.

of programming search queries and that the invention overcomes that by autonomously facilitating their construction. But again, I do not agree with this. Turning to the application, the background sets out two well-known search techniques each with inherent problems. Those are a lack of data to search in relation to text-based image searching, and in respect to visual-based image searching the problem is apparently a lack of image quality or a lack of images entirely. So it appears the main problem is actually in acquiring data through which to search. Undeniably, the invention is looking to resolve that problem as opposed to circumventing it. However, that problem and solution are not technical.

- 36 In their examination report of 28 June 2019, the examiner quoted from the decision of Justice Lewison (as he was then) in *Autonomy*⁷ and I think it is important for me to recite paragraph 40 of the judgment again here with some emphasis added:

In my judgment, as Mr Tappin submitted, automatic text analysis, comparison and results generation is a paradigm example of a case in which the contribution falls squarely within excluded matter, i.e. a program for a computer. The claimed contribution, so far as the first element is involved does not exist independently of whether it is implemented by a computer. On the contrary, it depends on a computer processing or displaying information in an active window, and on a search program to analyse it and to compare and generate results. Nor does it require new hardware or a new combination of hardware; and it does not result in a better computer. The only effect produced by the invention is an effect caused merely by the running of the program, which consists of the manipulation of data. It is in short a claim to a better search program.

- 37 These facts of the *Autonomy*⁷ decision are directly comparable to those I am considering. If the reference to “text” were substituted with “image” then one would immediately apply the judgment to this application. The *Autonomy*⁷ decision was made before *HTC/Apple*⁵ and was made by a lower court, but as I have indicated above, nothing in *HTC/Apple*⁵ contradicts this. Although not binding, these obiter comments are highly persuasive and influential; I cannot overlook the judge’s opinion. The invention falls wholly within the excluded fields.

Application of the Aerotel approach to GB1612864.7

Step 1: Properly construe the claim

- 38 The similarities between GB1612864.7 and GB1612865.4 mean I can address the issues of GB1612864.7 more succinctly. The invention of GB1612864.7 is straightforward to follow and presents no issues in construing the scope. The examiner and the applicant are each content there is no difficulty in understanding the claims. As with GB1612865.4, there is the implicit inclusion of a collection of data.

Step 2: Identify the actual (or alleged) contribution

- 39 On this application, the examiner and the applicant agree on the contribution, and I see no reason to disagree:

A tool which facilitates a user in constructing a search query by selecting image attributes from a plurality of images and providing a sketch, the user-provided sketch is then used to modify an attribute of the first image, the extracted and user-modified attributes are then used as a search query for finding images with similar attributes.

Steps 3 and 4: Ask whether the contribution falls solely within the excluded subject matter and whether it is technical in nature

- 40 Many of the arguments presented on this application are similar to those made on GB1612865.4. I can quickly dismiss those in respect of the relevance of the Apple invention, *mutatis mutandis*.
- 41 Furthermore, it is clear from the definition of the contribution that the *Autonomy*⁷ *above*⁷ judgment is equally applicable to here. *Autonomy*⁷ *above*⁷ makes it very clear that constructing search queries is not technical.
- 42 I must single out one feature of the contribution which might be seen as offering an olive branch to save the application. The contribution clearly includes user-interaction in providing a sketch used to modify an image attribute. In Apple's invention, the feature of a user interacting with the device in a new way was important in deciding the technical effect. I must turn to the supporting description to understand the significance of the sketch. However, the only support for this feature comes from paragraph 0057, which, while I'm sure it provides sufficient direction to the skilled addressee to work the invention, does not explain any particular significance or new feature. As such, I do not think I can say this feature provides anything significant to the stock of human knowledge; it cannot save the application.

Decision

- 43 I find the inventions claimed in GB1612864.7 and GB1612865.4 to fall solely within matter excluded under Section 1(2) as a program for a computer as such. I can find no amendment in the specification that will render the claims patentable. I therefore refuse the application under Section 18(3).

Appeal

- 44 Any appeal must be lodged within 28 days after the date of this decision.

Peter Mason
Deputy Director, acting for the Comptroller

Annexe

GB1612864.7

Independent claims, filed 17/09/2019

1. A computer-implemented method for facilitating searching using a specific attribute found in an image, the method comprising:
 - training different layers of a neural network to extract specific attributes from a set of images;
 - extracting, by the neural network, first image attributes from a first image provided by a user via a user device;
 - extracting, by the neural network, second image attributes from a second image provided by a user via the user device; and
 - providing search results from the set of images responsive to a selection of at least one image attribute from each image, the selection received as a search query from the user, wherein the selection(s) comprise at least one attribute of the image and a user-provided sketch, the user-provided sketch being used to modify an attribute of the first image.

6. A computerized system comprising:
 - a processor; and
 - computer storage media storing computer-usable instructions that, when used by the processor, cause the processor to:
 - train different layers of a neural network to extract specific attributes from a set of images;
 - extract, by the neural network, first image attributes from a first image provided by a user via a user device;
 - extract, by the neural network, second image attributes from a second image provided by a user via the user device; and
 - provide, to the user via the user device, a search results preview comprising result images responsive to a selection of at least one image attribute from each image, the selection received as a search query from the user, wherein the selection(s) comprise at least one attribute of the image and a user-provided sketch, the user-provided sketch being used to modify an attribute of the first image.

GB1612865.4

Independent claims, filed 02/10/2017

1. A computer-implemented method for facilitating searching using a specific attribute found in an image, the method comprising:
 - training a neural network to extract specific attributes from a set of images, wherein different layers of the neural network correspond to different specific attributes;
 - receiving, at the neural network, an image;
 - extracting, by the neural network, attributes from the image;
 - providing a search preview comprising a set of result images, the set of result images being visually similar to the image and comprising at least one result attribute that is different from the attributes extracted from the image;
 - receiving a selection of a result image of the set of result images;
 - initiating a search query based on the selection; and

providing refined search results based on the selection.

8. A computerized system comprising:
 - a processor; and
 - computer storage media storing computer-usable instructions that, when used by the processor, cause the one or more processor to:
 - train a neural network for specific attributes from a set of images, wherein different layers of the neural network correspond to different specific attributes;
 - receive, at the neural network, an image;
 - extract, by the neural network, attributes from the image;
 - provide a search preview comprising a set of result images, the set of result images being visually similar to the image and comprising at least one result attribute that is different from the attributes extracted from the image;
 - receive a selection of a result image of the set of result images;
 - initiate a search query based on the selection; and
 - provide refined search results based on the selection.