Intellectual Property Office

BL O/303/19

31 May 2019

PATENTS ACT 1977

APPLICANT	Adobe Inc.
ISSUE	Whether Patent application GB1513017.2 complies with Section 1(2)
HEARING OFFICER	Mrs S E Chalmers

DECISION

1 Patent application number GB 1513017.2 was filed on 23 July 2015 claiming a priority date of 24 November 2014 from an earlier US application. It was published as GB 2532539 on 25 May 2016.

2 The combined search and examination report, dated 28 January 2016, reported under Section 17(5)(b) that search would serve no useful purpose and that the claimed invention was excluded from patentability as a business method and computer program as such. Several rounds of amendment and re-examination followed with the examiner maintaining that the invention was excluded throughout. A hearing was offered in the examination report of 26 September 2018 highlighting that if the agent responded but did not request a hearing then the application may, nonetheless, be passed for a decision on the papers on file. The agent responded on 23 January 2019 with further amendments and arguments, but these didn't convince the examiner and the case was passed to me for a hearing on the papers.

3 I confirm in reaching my decision that I have considered all the correspondence on file.

4 It is noted that the question as to whether the application relates to excluded matter is the only issue that has been examined to date and the only matter to be decided. Consequently, if I find in favour of the applicant I will need to remit the application back to the examiner for further consideration.

The Invention

5 The application is entitled "Searching for safe policies to deploy" and is said to describe risk quantification, policy search, and automated safe policy deployment techniques. The described embodiments use policies to select advertisements to be shown to users. There is said to be a problem with conventional techniques that select such a policy for deployment as they do not guarantee that a newly selected policy will perform better than a current policy which can lead to loss of revenue and other inefficiencies. The invention works by searching a plurality of policies to locate

a policy which is deemed “safe”; meaning that the performance of the policy is greater than a threshold performance and within a defined level of confidence indicated by statistical guarantees derived from data describing deployed policies performance. To improve searching efficiency the search is constrained in a policy space to line searches in a direction that is expected to point towards an expected safe region according to a generalized natural policy gradient. The “safe” policy is then used to replace the current policy. Examples of greater performance include an increased number of selections of the advertisements, an increased number of conversions in which the user purchased the goods or service advertised or increased revenue.

6 It is said that the techniques described may be used for other policies including lifetime value optimization in marketing systems, news recommendation systems, patient diagnosis systems, neuro-prosthetic control and automatic drug administration. However, no details of such applications are given.

The claims

7 The current claim set includes two independent claims numbered 1 and 8 relating to a method and system respectively. In the absence of any arguments to the contrary, I shall assume these claims stand or fall together. Claim 1 reads:

> *1. In a digital medium environment for identifying and deploying potential digital advertising campaigns, where campaigns can be altered, removed, or replaced on demand, a method for optimizing campaign selection in the digital medium environment, the method comprising:*
>
> *controlling replacement of one or more deployed policies of a content provider that are used to select advertisements with at least one of a plurality of policies, the controlling including:*
>
> *searching a plurality of policies to locate the at least one said policy that is deemed safe to replace the one or more deployed policies, the at least one said policy deemed safe if a measure of performance of the at least one said policy is greater than a threshold measure of performance and within a defined level of confidence as indicated by one or more statistical guarantees computed through use of reinforcement learning and concentration inequalities on deployment data generated by the one or more deployed policies,*
>
> *wherein the one or more statistical guarantees are configured as performance bounds defined by the concentration inequality on the likely performance of the at least one said policy;*
>
> *responsive to the location of the at least one said policy that is deemed safe to replace the one or more other policies, causing the replacement of the one or more other policies with the at least one said policy, wherein:*
>
> *each of the plurality of policies is expressed using a high-dimensional vector; and*
>
> *the searching includes computing a direction in a policy space that is expected to point towards a safe region;*
>
> *the searching is constrained to line searches of the high-dimensional vectors of the plurality of policies that correspond to the direction,*

selecting at least one advertisement based on the at least one said policy; and

communicating the selected advertisement to a client device.

The law

8 The section of the Act concerning inventions excluded from patentability is Section 1(2), which reads:

> *"1(2) 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)...*
> *(b)...*
> *(c) a scheme, rule or method for … 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."*

9 The Court of Appeal has said that the issue of whether an invention relates to subject matter excluded by Section 1(2) must be decided by answering the question of whether the invention reveals a technical contribution to the state of the art. The Court of Appeal in *Aerotel/Macrossan*[1] set out the following four-step approach to help decide the issue:

> *1) Properly construe the claim;*
> *2) Identify the actual (or alleged) 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 The operation of the approach is explained at paragraphs 40-48 of the judgment. Paragraph 43 confirms that identification of the contribution is an exercise in judgment involving the problem said to be solved, how the invention works and what its advantages are; essentially, what it is the inventor has really added to human knowledge, looking at substance, not form. Paragraph 47 adds that a contribution which consists solely of excluded matter will not count as a technical contribution.

11 In Symbian[2] the Court of Appeal reaffirmed the Aerotel approach while considering a question of "technical contribution" as it related to computer programs emphasising the need to look at the practical reality of what the program achieved, and to ask whether there was something more than just a "better program".

12 The case law on computer implemented inventions was further elaborated in AT&T/CVON[3] which provided five helpful signposts to apply when considering

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[1] Aerotel Ltd v Telco Holdings Ltd (and others) and Macrossan's Application [2006] EWCA Civ 1371
[2] Symbian Ltd's Application [2009] RPC 1
[3] AT&T Knowledge Ventures LP and CVON Innovations Limited v Comptroller General of Patents [2009] EWHC 343

whether a computer program makes a relevant technical contribution. In HTC v Apple[4], Lewison LJ reconsidered the fourth of these signposts and felt that it had been expressed too restrictively. 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 make the computer a better computer in the sense of running more efficiently and effectively as a computer; and*
> *v) whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.*

13 The reports and letters on file also refer to *Lantana*[5], *Halliburton Energy Services*[6] and the Hearing Officer's decision in *Landmark Graphics Applications*[7].

Application of the Aerotel approach

Step 1: Properly construe the claim

14 In their most recent letter the applicant submits that claim 1 is sufficiently clear and there is no need to further construe the terms used. The examiner does not disagree that the claim is clear but does set out their construction of the term "safe".

15 Overall, I agree that the claim is clear. I note that the claim refers to communicating the selected advertisement to a client device but does not define any aspect of this communication. I understand the term "safe" to mean that the new policy is anticipated to perform better than the deployed policy (in relation to selections of the advertisements, conversions in which the user purchases the good or service advertised and/or revenue). The claim refers to a "measure of performance" of the policies; this is a prediction of the likely future performance of a policy in selecting adverts not a measurement in the conventional sense. Claim 1 relates to:

> *A method for optimizing advertising campaign selection controlling replacement of a deployed policy used to select advertisements with a new policy by searching a plurality of policies to locate a policy that is deemed safe to replace the deployed policy, the policy being deemed safe if a measure of performance of the policy is greater than a threshold measure of performance and within a defined level of confidence as indicated by statistical guarantees computed through use of reinforcement learning and concentration inequalities on deployment data generated by the deployed policy wherein the statistical guarantees are configured as performance bounds defined by the concentration inequality on the likely performance of the policy; responsive to the location of a new policy that is deemed safe, causing the replacement of the*

[4] HTC v Apple [2013] EWCA Civ 451
[5] Lantana v Comptroller General of Patents [2014] EWCA CiV 1463
[6] Halliburton Energy Services [2011] EWHC 2508
[7] BL O/112/18

deployed policy with the new policy, wherein each of the plurality of policies is expressed using a high-dimensional vector, the searching includes computing a direction in a policy space that is expected to point towards a safe region and the searching is constrained to line searches of the high-dimensional vectors of the plurality of policies that correspond to the direction; selecting an advertisement based on the new policy; and communicating the selected advertisement to a client device.

Step 2: Identify the actual (or alleged) contribution

16 As no search has been performed the analysis of step 2 concerns the alleged contribution. The most recent letter from the applicant proposes that the alleged contribution is a new autonomous system which is capable of automatically analysing the deployment of policies to provide statistical guarantees that proposed new policies are safe by being within acceptable performance bounds, and subsequently communicating advertisements based on newly deployed policies.

17 The examiner broadly agrees with this proposal but that they would more particularly define it as searching a high-dimensional policy space so as to replace policies used to select adverts for communication, the searching including computing a direction in the policy space that is expected to point towards a safe region of the policy space, where safe is defined by a measure of performance of a policy being greater than a threshold and within a desired level of confidence as indicated by statistical guarantees; and wherein the computed direction is used to constrain searching to line searches of the high-dimensional vectors of the plurality of policies that correspond to the computed direction.

18 The alleged contribution lies in:

A method of replacing an existing policy used to select advertisements with a new policy which is predicted to exceed a threshold of performance, such as in relation to revenue, selections of the advertisements and/or conversions in which the user purchases the good or service advertised, with a defined level of confidence from statistical guarantees; the new policy being identified by line searching a plurality of policies expressed using high-dimensional vectors in a direction in a policy space that is expected to point towards a region where policies are predicted to exceed the performance threshold; then selecting and communicating an advertisement to a client device using the new policy.

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

19 The examiner argues that the invention is no more than business method and computer program as such. They consider the problem to be one of how to select replacement policies that select advertisements according the statistical guarantees of performance. Any improvement is said to be an improved method of doing business.

20 To that end the examiner notes that computer systems which implement a better method of doing business are not patentable referring to paragraph 35 of *Halliburton Energy Services Inc*, which reads:

"The business method cases can be tricky to analyse by just asking whether the invention has a technical effect or makes a technical contribution. The reason is that computers are self-evidently technical in nature. Thus, when a business method is implemented on a computer, the patentee has a rich vein of arguments to deploy in seeking to contend that his invention gives rise to a technical effect or makes a technical contribution. For example, the computer is said to be a faster, more efficient computerized book keeper than before and surely, says the patentee, that is a technical effect or technical advance. And so it is, in a way, but the law has resolutely sought to hold the line at excluding such things from patents. That means that some apparently technical effects do not always count. So a computer programmed to be a better computer is patentable (Symbian) but as Fox LJ pointed out in relation to the business method exclusion in Merrill Lynch, the fact that the method of doing business may be an improvement on previous methods is immaterial because the business method exclusion is generic".

21 Turning to the computer program exclusion the examiner finds that the contribution would require a computer program for its implementation and goes on to analyse the *AT&T* signposts. The examiner says that the first signpost does not apply as the system has no links or technical effect on anything external to the computer system on which method is being run and that communicating an advertisement is not a technical effect. The second, third and fourth signpost are also said not to apply as the computing apparatus being used is entirely standard; there is nothing to suggest an effect occurs at architectural level, the system is not operating in a new way and the computer is not a better computer; rather the alleged contribution is a better software tool for the particular purpose of optimizing policy selection. Finally, the examiner concludes that the fifth signpost is not relevant as the problem is not technical in nature.

22 The applicant disagrees in their letters, asserting that the claimed invention involves "technical considerations" and addresses the "technical problem" of how to provide a "technical implementation" which allows for analysing the deployment of policies to provide statistical guarantees that proposed new policies are safe by being within acceptable performance bounds, and subsequently communicating advertisements based on newly deployed policies.

23 They go on to note that the *AT&T* signposts are not determinative in every case, are only examples of subject-matter that might provide a technical contribution, not prescriptive conditions nor an exhaustive list of the only subject matter which may be considered an invention. They submit that, in any event, the claimed invention falls within at least the first, third, fourth and fifth signposts but do not elaborate on this. They then conclude that, in their opinion, the claimed invention does not fall solely within the excluded subject matter.

24 The applicant also suggests that their submissions meet the standard referred to in the decision in *Landmark Graphics* and that "*where an applicant makes a reasonable case that their invention is patentable then [the Examiner is] bound to find in their favour*". That standard does not import something like the criminal burden of proof into patent proceedings. It could equally be said that where an examiner makes a reasonable case that an invention is excluded then the applicant/agent must do more than assert that the examiner is incorrect, that their invention is "technical" and not

excluded for the examiner to find in their favour. In this case the applicant provides little basis in law for their assertions that the claimed invention is not excluded, involves “technical considerations”, addresses a “technical problem”, provides a “technical implementation” and meets the first, third, fourth and fifth signposts.

25 The invention performs a constrained search for a new policy used to select advertisements to communicate to a client computer to replace an existing policy whilst reducing the likelihood of lost revenue by determining whether policies are predicted to exceed a performance threshold with a level of confidence. On the face of it this is nothing more than a business process and not technical in nature. In the absence of any compelling argument to the contrary drawing upon precedent case law I find the alleged contribution is a method of doing business as such.

26 As stated in paragraph 35 of *Halliburton Energy Services Inc*, the business method exclusion is generic and, if implemented with a computer program, any improvement over previous programs is immaterial. However, as the configuration of the computing devices claimed would be implemented by computer programs as a matter of practical reality I will consider the *AT&T* signposts for completeness.

27 The first signpost does not assist the applicant as there is no technical effect on a process outside the computer; all processes are within the computer system to search for a new advertisement selection policy and then communicate an advert from one computer to another based on that policy. There is no suggestion of any effect at the level of the architecture of the computers in the system, of any computer being made to operate in a new way or any computer being a better computer; the computers involved are standard and it is the program for searching for a policy to select adverts to communicate to a client computer which is new and better than policy selection programs which have gone before. Whilst the policy search is constrained in policy space to be more efficient/effective than a brute force policy search it is still just a better policy search not a better computer; the second, third and fourth signposts do not help the applicant. Lastly, the problems described in the application concern a loss of revenue arising from poor policies which is a business problem; no technical problems are overcome, and the fifth signpost does not apply.

28 Whilst the AT&T signposts are not always determinative I have not been able to identify anything which is technical in nature and more than a better program. I find the alleged contribution is also a program for a computer as such.

29 In conclusion I find that the invention defined by claim 1 is excluded by Section 1(2) of the Act as a method for doing business and program for a computer as such. The same conclusion applies to claim 8 and I have considered the whole specification including the dependent claims and cannot identify any features which would alter this conclusion.

Decision

30 I have found that the contribution made by the invention defined by the claims falls solely in matter excluded from patentability by virtue of Section 1(2) of the Act as a method for doing business and program for a computer as such. I therefore refuse this application under Section 18(3).

Appeal

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

MRS S E CHALMERS

Deputy Director, acting for the Comptroller