



PATENTS ACT 1977

APPLICANT American Express Travel Related Services
Company, Inc.

ISSUE Whether patent application GB1821275.3 complies
with section 1(2)(c) of the Patents Act 1977

HEARING OFFICER Ben Buchanan

DECISION

Background

- 1 This decision relates to whether patent application GB1821275.3 complies with Section 1(2)(c) of the Patents Act 1977 (“the Act”).
- 2 The application was filed on 1 July 2016 as a PCT application (subsequently published as WO2018/004679) and entered the United Kingdom national phase on 28 December 2018 together with amended claims. The application was published on 13 March 2019 as GB2566402A. An examination report was issued on 16 April 2020 which objected to lack of novelty and excluded subject matter (as a program for a computer and method for doing business). In light of the excluded matter objection the search for prior art was not updated. Amended claims were submitted on 31 July 2020 which overcame the novelty objection and comments were submitted regarding the allowability of the claims under Section 1(2)(c). A subsequent examination report was issued on 7 August 2020 reformulating the excluded subject matter objection against the amended claims and suggesting a hearing be requested to decide the issue. Further amended claims were submitted on 7 October 2020 and the Applicant requested a hearing. The Examiner addressed the latest claims and maintained his arguments in a letter dated 10 December 2020.
- 3 On 26 January 2021, the Agent withdrew the hearing request, instead opting for a decision based on the papers currently on file. I confirm I have considered all of the correspondence on file in this decision.
- 4 This decision considers whether the application defines an invention which is excluded from patentability under Section 1(2)(c) of the Act. As I have noted above, the search for prior art is not complete, but at the moment there are no other objections outstanding. This means that if the application as it stands is not refused, I will remit it to the Examiner for completion of the examination process.

Subject matter

- 5 The claimed invention relates to a method, computer-based system and program on a storage medium for authenticating payment transactions.
- 6 Three independent claims exist. Claim 1 defines a method; Claim 8 defines a system for performing operations to implement the method; Claim 15 defines a storage medium with instructions for implementing the method. Claims 8 and 15 are unitary with and defined in similar terms to claim 1, so that they will stand or fall with the decision regarding claim 1. I shall therefore consider only claim 1 in detail and apply my reasoning, by extension, to claims 8 and 15.
- 7 Claim 1 reads:

“A method comprising:

receiving, by a processor, an authentication MAC, an integrity MAC, and transaction data transmitted from a payment application and a payment terminal, wherein the integrity MAC is generated from the transaction data using a cryptography key stored in the payment application;

generating, by the processor, a local integrity MAC using the transaction data as an input to a first cryptographic operation using a copy of the cryptography key accessible by the processor;

comparing, by the processor, the local integrity MAC to the received integrity MAC and authenticating the received integrity MAC in response to the local integrity MAC matching the received integrity MAC;

in response to the local integrity MAC not matching the received integrity MAC: generating, by the processor, a local authentication MAC using a second cryptographic operation, wherein the only data input to the second cryptographic operation is independent of any data received by the processor from the payment application or the payment terminal;

and comparing, by the processor, the local authentication MAC to the received authentication MAC and authenticating the received authentication MAC in response to the local authentication MAC matching the received authentication MAC;

and authenticating, by the processor, the payment application in response to a successful authentication of the received authentication MAC or the received integrity MAC.”

The law

- 8 The examiner has objected under Section 1(2)(c) of the Act that the invention defined by the claims is not patentable because it relates to one or more categories of excluded subject matter. The relevant provisions of this section of the Act are shown below:

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*

...

(c) a scheme, rule, or method for performing a mental act, playing a game or doing business, or a program for a computer;

...

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 assessment of patentability under Section 1(2) is governed by the judgment of the Court of Appeal in *Aerotel*¹, as further interpreted by the Court of Appeal in *Symbian*². In *Aerotel* 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) 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 The Court of Appeal in *Symbian* made it clear that the four-step test in *Aerotel* 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 *Aerotel* 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* that the question of whether the invention makes a technical contribution can take place at step 3 or 4.

11 Lewison J (as he then was) in *AT&T/CVON*³ set out five signposts that he considered to be helpful when considering whether a computer program nonetheless makes a technical contribution. In *HTC/Apple*⁴ the signposts were reformulated slightly in light of the decision in *Gemstar*⁵. The signposts are:

i) whether the claimed technical effect has a technical effect on a process which is carried on outside the computer

¹ *Aerotel Ltd v Telco Holdings Ltd & Ors* Rev 1 [2007] RPC 7

² *Symbian Ltd v Comptroller General of Patents* [3009] RPC 1

³ *AT&T Knowledge Ventures/CVON Innovations v Comptroller General of Patents* [2009] EWHC 343 (Pat)

⁴ *HTC v Apple* [2013] EWCA Civ 451

⁵ *Gemstar-TV Guide International Inc v Virgin Media Ltd* [2010] RPC 10

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.

Analysis: Application of the Aerotel approach

Step (1): Properly construe the claim

- 12 The Examiner and the Applicant agree that the construction of claim 1 is straightforward and that the claims are clear. I agree that this step requires no further comment.

Step (2): Identify the actual or alleged contribution

- 13 The Examiner and the Applicant disagree in their assessments of the contribution.

- 14 In their letter of 7 October 2020 the Agent suggested the contribution should be interpreted as:

“a method of authenticating received data after transmission of the data over a network, wherein the method reduces the likelihood that the data is generated fraudulently before transmission over a network whilst also reducing the likelihood that the received data is subject to network transmission errors, without expanding additional processor resources unnecessarily.”

- 15 The key to this interpretation is that the claimed invention defines two MACs being provided to the processor. A transaction is authenticated on the basis of the first of these, the integrity MAC, and *only if the authentication fails* is a local authentication MAC generated and compared with the received second MAC. The Applicant alleges that the contribution is provided regardless of the information content of the data, namely regardless that it relates to a payment transaction. The Applicant also alleges that the contribution relates to network security and accuracy and therefore arises outside of a computer.

- 16 In his letter of 10 December 2020 the Examiner identified the contribution as:

“a method of authenticating a payment transaction using two separately generated MACs in the authentication of a transaction, where the second MAC is only produced if the first fails, the method reducing the likelihood that a payment application is declined as a consequence of payment network transmission errors in the absence of fraud, without expending additional processor resources unnecessarily.”

- 17 The Examiner's formulation expressly reflects some of the explanation I have provided to complement the Applicant's formulation.
- 18 I am grateful to the Applicant for setting out the relevant case law when identifying the contribution of a claimed invention in their letter of 7 October. I agree with the approach suggested and with the assertion that the contribution is not limited to the novel features of a claim, but related to the effects, features or advantages associated with the novel features of a claim. In respect of the latter, the Applicant emphasises that the local authentication MAC is only compared to the received authentication MAC if the compared integrity MACs do not match; and the local authentication MAC is generated using only data independent of data received relating to the transaction transmitted over the network.
- 19 In coming to my own assessment of the contribution, consistent with the approach advocated by the Applicant, I will follow the considerations to be applied when identifying the contribution outlined by Jacob LJ in paragraph 43 of *Aerotel*:
- "The second step – identify the contribution – is said to be more problematical. How do you assess the contribution? Mr Birss submits the test is workable – it is an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are. What has the inventor really added to human knowledge perhaps best sums up the exercise. The formulation involves looking at substance not form – which is surely what the legislator intended."*
- 20 The problem to be solved is to control the authentication of fraudulent transactions whilst not declining genuine transactions which are affected by corruption of data due to network interruption (and which may appear fraudulent to prior art systems).
- 21 The invention works as follows. A processor receives three pieces of data (from a payment terminal and a payment application); namely an authentication MAC, an integrity MAC, and transaction data. The processor performs a first check on the transaction by using the transaction data to generate a local integrity MAC and comparing that with the received integrity MAC. If the two match the transaction is authenticated. If the two don't match, a local authentication MAC is generated by the processor using data which is independent of any transaction data transmitted over the network (by the payment terminal). The local authentication MAC is then compared to the received authentication MAC and if the two match the payment transaction is authenticated.
- 22 The advantages of the claimed invention are described in paragraph [0038] of the description, and amount to fewer disputed transactions (due to network interruption) and a reduced approval rate for fraudulent transactions. In other words, improved reliability of authentic transactions. Furthermore, as highlighted above, the claimed invention only expends resource authenticating the second MAC if authentication of the first MAC fails, thus resources are used efficiently.
- 23 What has the Applicant added to human knowledge? This can be summed up as improved authentication of valid transactions; specifically a method of authenticating transactions with a secondary localised method of authentication if a primary

authentication fails due to being inadvertently rejected due to transmission integrity errors.

- 24 To be clear, there is no suggestion that the claimed invention provides improved detection of fraudulent transactions; it is not a *better authentication process* in the sense of being more secure. Additionally, although I am not sure the wording of the Applicant's formulated contribution is intended to mean this, the claimed invention does not *reduce the likelihood that data is generated fraudulently before transmission over the network*. There is nothing in the application as filed or the invention as claimed to suggest that fraudulent transactions are less likely to be attempted. Similarly, the claimed invention does not *reduce the likelihood that the received data is subject to network transmission errors*. There is nothing in the application as filed or the invention as claimed to suggest that transmission errors are less likely to occur per se. However, there is one distinction in the Applicant's formulation which I think is important, which is that the *received data is authenticated after transmission*. This is not explicit in the Examiner's formulation and yet is important for the invention to operate as claimed and give rise to the alleged advantages noted above.
- 25 I have to say I am not persuaded by the argument in the Applicant's letter of 7 October that the claimed invention *just happens* to be related to transaction data and authentication of a payment application. The claim clearly defines the invention as such. That said, the contribution and its advantages do not arise as a consequence of the nature of the transaction, so I am prepared to generalise my consideration of the *alleged* contribution, notwithstanding the scope of the claim. It is also important that the local authentication MAC is generated independently of the data received via the transaction transmission.
- 26 For these reasons, in considering the Examiner's and the Applicant's formulations of the contribution, I find myself favouring aspects of both but neither as they stand. I identify the actual contribution to be:

A method of authenticating received data after transmission over a network, wherein the method performs a first authentication by comparing a first transmitted MAC with a first locally generated MAC which is generated using the transmitted data; and if this is rejected, a subsequent authentication is performed by comparing a second transmitted MAC with a second locally generated MAC which is generated without using the transmitted data; thereby reducing the likelihood that the transaction is rejected due to network transmission errors by selectively using resources.

Steps (3) & (4): Does the contribution fall solely within the excluded subject matter?: check if the contribution is actually technical.

- 27 The third and fourth steps of the *Aerotel* 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.

- 28 In addressing this question, both the Examiner and Applicant have made clear reference to the *AT&T/CVON* signposts and I will do the same. I note that in the Applicant's responses only reference to signpost (i) has been explicitly made, however I will address all five.
- 29 The Applicant's position is that transmitting data over a network is a process which is carried on outside of the computer and therefore the invention should be considered technical in nature.
- 30 With respect to signpost (i) the Examiner has argued that the process takes place entirely within a computer system and no technical effect outside the computer is effected or affected. In his letter of 10 December he has clarified that in the context of signpost (i) "the computer" may be a networked of computers, consistent with *Birss J in Lantana Ltd v Comptroller-General of Patents, Designs and Trade Marks [2013] EWHC 2673 (Pat)* at paragraph 30 and confirmed on appeal in *Lantana Ltd v Comptroller-General of Patents, Designs and Trade Marks [2014] EWCA Civ 1463* at paragraph 46. There is therefore no technical effect on any process outside the computer system.
- 31 I agree with the Examiner. The contribution does nothing to control or alter the transmission of data; the likelihood that transmission is disrupted is unaffected. What the contribution provides is a method of dealing differently with the potential consequences of interrupted transmission, after the event.
- 32 With respect to signposts (ii)-(iv), the claimed invention does not operate at the level of the architecture of the computer. The data, even in my generalised formulation of the contribution, is transaction data. The claimed invention only works for transaction data transmitted across a network, not irrespective of the data processed or the applications run on computers in the network. Nor does the computer operate in a new way. The operation of the computers within the network and the network as a whole is conventional. Only the operation of the transaction authentication procedure is changed, in accordance with the computer program. As the Applicant has argued and as I have acknowledged, the local authentication MAC is only generated (expending resources) when necessary. This is a tempting argument under signpost (iv) for a "better computer in the sense of running more efficiently and effectively as a computer". However, the computer itself is unchanged. The selective use of resources is specific to the transaction authentication application and is not at the general level of the computer. In summary there is nothing in the claimed invention which makes the computer more efficient or effective as a computer.
- 33 Finally, signpost (v) asks whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented. There is indeed a problem here, a very real one that the transmission of data could be interrupted and transaction data potentially corrupted. This would result in a problem for genuine payment transactions. While this problem may well be a technical one, the invention does not actually solve the problem, as noted above. The incidence of network interruption is unchanged. The actual transmission is not improved, nor does the transmitted data enjoy greater reliability. Instead, the claimed invention performs an operation, and then undertakes a second step of authentication if a first fails due to interruption, by avoiding using transmitted data to generate the second MAC. This is circumventing the problem. The problem could alternately be formulated in addressing the

inadvertent refusal of genuine transactions resulting as a result of poor data transmission. This second formulation could be considered to be solved, but this formulation would be a business problem, not a technical one. Signpost (v) does not point towards a technical character to the contribution and no technical problem is solved.

- 34 Claim 1 then would seem to relate solely to a program for a computer as such. As claimed, the scope of the invention would also seem to be limited to the authentication of payment transactions via a payment terminal and a payment application. Even if the contribution of the claim is accepted as a more general contribution to the authentication of transactions (notwithstanding its exclusion as a program for a computer), there is nothing in the application as a whole to suggest that the transaction, and therefore the contribution to the art, is anything more than a method for doing business as such
- 35 In conclusion, in the absence of any technical nature of the contribution, I find that claim 1 defines a program for a computer and a method for doing business as such. It therefore does not comply with Section 1(2)(c) of the Act. As noted earlier, the same logic applies to claims 8 and 15 which are also refused.

Conclusion

- 36 Since the invention fails to comply with Section 1(2) of the Act because it is a program for a computer and method for doing business as such the application is refused under section 18 of the Act.

Appeal

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

BEN BUCHANAN

Deputy Director, acting for the Comptroller