



**PATENTS ACT 1977**

APPLICANT

David John Duke

02/08/2012

ISSUE

Whether patent application number  
GB 0709391.7 complies with sections  
1(1)(b) and 1(2)

HEARING OFFICER

MRS S E CHALMERS

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**DECISION**

**Introduction**

- 1 Patent application GB 0709391.7 entitled "Oblong Multiple Dimension Matrix Authentication" was filed on 16 May 2007 and published on 8 July 2009 as GB 2456048A. The extended compliance period ended on 25 July 2012.
- 2 The examiner argued that the claimed invention is excluded from patentability as presentation of information and also lacked an inventive step. Despite several rounds of correspondence between the examiner and the applicant's attorney the matter could not be resolved and the applicant requested a hearing. Shortly before a hearing was appointed, Mr Duke dispensed with his attorney's services and decided to represent himself.
- 3 The matter came before me at a telephone hearing on 25 July 2012 which the examiner, Mr Michael Warren, also attended. At the hearing, Mr Duke described his invention with reference to a website [www.cubeitz.com](http://www.cubeitz.com) which has been a great help to me. I also allowed him to file a response subsequent to the hearing to supplement arguments on inventive step that he made at the hearing and I confirm that I have taken account of these in my decision. Finally I would like to commend Mr Duke for the able way he put across his point of view given the complex legal issues he was faced with and to thank him for his patience in explaining the technical issues to me.

**The invention**

- 4 The application relates to a password entry system designed to prevent third parties from stealing personal identification numbers (PINs) when they are

entered in plain view. This is achieved by generating a matrix which contains random characters such as letters at the login process and providing selection buttons to select the row in which a character of the password exists. To make it harder for an unauthorised person to work out the password, each character is present in more than one line at once and the user has a choice of selection buttons. When the user enters his password, he selects a row which contains the character of the password and repeats this action for each character in the order in which they appear in the password. The computer can then match the password against the data collected from the characters in the selected rows.

## Claims

5 I have made my decision on the basis of the claims filed on 2 February 2012. There are 21 claims comprising claims to a data entry device (claims 1-11) and a method of validating entry of a PIN code (claims 12-21).

6 Claim 1 reads:

A data entry device for entering characters of a personal identification code, said data entry device configured to:

display a matrix of chambers surrounded by a plurality of selection buttons, and to receive an input corresponding to a selection of a selection button;

each chamber of said matrix of chambers contains a character therein;

said matrix of chambers contains at least one individual character of said personal identification code to be entered therein,

said matrix of chambers presents a plurality of lines (L) of said chambers,

each selection button allows selection of a sole line of said plurality of lines (L) of said chambers, and

an individual character of said personal identification code to be entered is displayed in each of a number ( $1 < N < L$ ) of a plurality of selectable lines (L) of said chambers at the same time, whereby

said data entry device provides a choice of lines of chambers within said matrix of chambers that are selectable as an input for each individual character of said personal identification code to be entered.

7 Claim 12 reads:

A method of validating entry of an individual character of a stored personal identification code to be entered, said method comprising the steps of:

a) providing a data entry device configured to display a matrix of chambers, each chamber containing a character therein and said matrix of chambers containing said individual character of said personal identification

code to be entered,

b) presenting selection buttons surrounding said matrix, each selection button allowing a sole line of chambers within said matrix of chambers to be selected,

c) displaying said individual character of said personal identification code to be entered in each of a number ( $1 < N < L$ ) of a plurality of selectable lines (L) of chambers at the same time,

d) receiving an input corresponding to selection of a line of chambers,

e) comparing the characters in a line of chambers selected at step d) with said individual character of said stored personal identification code to be entered.

## The law

- 8 To avoid over-complicating things, I would not normally use patent jargon or refer to sections of the Patents Act 1977<sup>1</sup> in a decision where the applicant is unrepresented. However, it is unavoidable when faced with an application where there are complex objections and the Court has set down legal tests that I must follow to ensure I apply the law correctly. I will therefore do my best to explain things in straightforward language as far as possible.

## Patentability

- 9 Section 1(2) of the Act states that certain inventions are “excluded” from being treated as inventions as far as patent law is concerned. This means that, however ingenious they are, they cannot have a patent granted for them. The section relevant to Mr Duke’s invention says:

*the following [...] are not inventions for the purposes of this Act, that is to say, anything which consists of –*

*[...]*

*(c) [...] a program for a computer;*

*(d) the presentation of information;*

- 10 The law concerning Section 1(2), particularly when it comes to computer programs, is complex. The courts have provided me with a test that I must apply when it comes to assessing whether a claim falls within these excluded inventions. It originates from the case of *Aerotel Ltd v Telco Holdings Ltd (and others) and Macrossan’s Application*<sup>2</sup>, and is referred to as the *Aerotel/Macrossan* test.

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<sup>1</sup> <http://www.ipo.gov.uk/patentsact1977.pdf>

<sup>2</sup> *Aerotel Ltd v Telco Holdings Ltd and Macrossan’s Application* [2006] EWCA Civ 1371. This decision can be found at: <http://www.ipo.gov.uk/2006ewcaciv1371.pdf>

11 This test for patentability comprises the following steps:

(1) properly construe the claim – this step involves making sure that the claim is clear and resolving any ambiguities in its wording;

(2) identify the actual contribution – this is “an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are” (from paragraph 43 of *Aerotel/Macrossan*)

(3) ask whether this contribution it falls solely within the excluded subject matter – this can be more than one category of the list of excluded inventions

(4) check whether the contribution is actually technical in nature – this can be considered as part of step 3. Whilst the use of a computer is undoubtedly “technical”, this does not usually mean that the mere presence of computing hardware keeps the claim from being excluded.

### **Application of the *Aerotel/Macrossan* test**

#### Step 1: Properly construe the claims

12 I do not believe there are any problems with the wording of the claims, and so take them as they are.

#### Step 2: Identify the actual contribution

13 Paragraph 43 of *Aerotel* explains I must identify the contribution by asking what it is – as a matter of substance not form – that the invention has really added to the stock of human knowledge having regard to the problem to be solved, how the invention works and what its advantages are.

14 Mr Duke’s position is that the contribution is a better way of enabling a user to securely enter a password in a public place where the data entry process can be observed or recorded. His invention does this by using a matrix of characters surrounded by selection buttons each associated with a line and the user selects the line which contains the character of the password. This character is present in more than one line at once and the user has a choice of selection buttons. This, Mr Duke says, makes it harder for an unauthorised person to work out the password.

15 It is clear from the documents identified by the examiner that the general idea of line selection to disguise a password character is known. For example, Figures 2 and 3 of US 5428349 show the use of a square matrix of six rows and six columns where the user enters a password by selecting either the row or column containing each character of a memorised password. Although each character must necessarily occur in one row and one column, the user is presented with one selection arrangement such that he can only select a column (Figure 2) or a row (Figure 3). As in Mr Duke’s application, after each selection is made, the matrix presented to the user is randomised before the next character is selected.

- 16 So what *in substance* has been added to the stock of human knowledge? As far as I can see, the general hardware and software being used is conventional so cannot add to the contribution. The examiner's position is that the contribution lies in an improved arrangement of the characters being displayed to enhance the security of the password being entered, i.e. an improved interface. However, it seems to me that this takes too narrow a view in that it does not take into account that each line in the display (whether horizontal, vertical or at an intermediate angle) has a selection button. In my view, this association also counts towards the contribution.
- 17 Summing up, I assess the contribution as being a way of enabling a user to more securely enter a password by providing a better interface displaying a matrix of characters surrounded by selection buttons where each character is displayed in more than one line of the matrix and each selection button allows selection by the user of a line in the matrix that contains the character of the password.

Steps 3 and 4: Ask whether the contribution relates solely to excluded matter and check whether it is technical

- 18 So, does the contribution fall solely within the excluded subject matter? In considering the nature of this contribution, I am mindful of paragraph 22 of *Aerotel/Macrossan*, which reminds me that just because a computer is used in an invention, it does not necessarily mean that the invention is excluded from patentability.
- 19 It is clear that Mr Duke's invention is implemented by a computer program, and that the program requires only a conventional computing device in order to run it. There appears to be no suggestion in the application that there is anything unusual in the hardware being used, and none of the applicant's arguments suggest as much.
- 20 There is no doubt in my mind that the invention as currently claimed is all to do with the arrangement of the display of the data entry device i.e. the matrix and selection buttons. The contribution therefore clearly resides in the presentation of information and the presence of a display does not change this. However, this does not mean that it should be immediately excluded.
- 21 The Court has made clear that providing a better (or new) user interface is not a relevant technical effect – a different display is not enough. What matters is that to be patentable there must be some technical effect beyond the information being presented. At the hearing, Mr Duke argued that the improved security of the authentication process and the user's ability to choose which line (whether horizontal, vertical or at an intermediate angle) to select provided the necessary technical contribution. However, I do not believe that this meets the requirements of patent law because as far as I can see, this advantage appears to be down to the way the computer is programmed. In particular, the comparison step in which the characters in a selected line of characters is compared with a character in a stored personal identification code is a matter of computer programming and is not technical.

22 Whilst I agree that the invention is technical in the broadest sense in that it involves a computer, I am clear that the contribution made by the invention does relate to excluded matter as such and does not have a relevant technical effect. I therefore find that the contribution identified at step 2 is not technical and relates to excluded matter, namely a computer program and presentation of information.

### **Inventive step**

23 Section 1(1)(b) of the Act requires that the invention for which a patent is to be granted must involve an inventive step. "Involve an inventive step" means that the invention, when compared with what is already known, would not be obvious to someone with a good knowledge and experience of the subject. For example, an invention would be obvious if the only difference between it and what was known was the result of applying common general knowledge or adding a feature which was well known.

24 When considering whether the claims involve an inventive step, I must apply the four-step test set out by the Court of Appeal in *Windsurfing*<sup>3</sup> and restated by that Court in *Pozzoli*<sup>4</sup>. These steps are:

(1)(a) Identify the "person skilled in the art"

(b) Identify the relevant common general knowledge of that person;

(2) Identify the inventive concept of the claim (essentially, what is the crux of the invention);

(3) Identify the differences between the documents cited as forming part of the "state of the art" and the inventive concept;

(4) Viewed without any knowledge of the invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

#### Step 1: Identify the person skilled in the art and his common general knowledge

25 The skilled person is a fictional construct, a person of moderate skill but lacking in ingenuity – he can use his knowledge of the field in which he works and make routine modifications but not be able to think laterally. In this case, I have identified the skilled person as a researcher or technician working in the field of data entry interfaces for PIN/password entry. As part of his common general knowledge, he would be aware of, for example, common methods for phishing and otherwise obtaining passwords and codes by deception and ways to inhibit those methods.

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<sup>3</sup> *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd* [1985] RPC 59. This can be viewed at <http://rpc.oxfordjournals.org/content/102/4/59.full.pdf+html>

<sup>4</sup> *Pozzoli SpA v BDMO SA* [2007] EWHC Civ 588. This can be viewed at <http://www.bailii.org/ew/cases/EWCA/Civ/2007/588.html>

## Step 2: Identify the inventive concept

- 26 The inventive concept is a device and method for entering a personal identification code, comprising: displaying a matrix of chambers arranged to form lines, each chamber containing a character, and the matrix containing at least one character of the code to be entered; also displaying a plurality of selection buttons surrounding the matrix and allowing selection of one of the lines of chambers within the matrix, where the character of the code is displayed in multiple selectable lines at the same time; receiving an input selecting a line, and comparing the characters contained within the selected line with the corresponding character of the personal identification code.

## Step 3: Identify the differences between the state of the art and the inventive concept

- 27 Patent law defines the “state of the art” as being anything that was made public prior to the filing date of the application, regardless of the country, language, age or medium. The document I have used as the “state of the art” is US5428349 (BAKER)<sup>5</sup>. BAKER describes a data entry device which is designed to prevent a password from being worked out by an unauthorised observer. The system works by selecting a row or column which contains the character of the password. After each selection is made, the matrix presented to the user is randomised, and the next character selected. The difference between this document and the invention is that the selection arrangement in BAKER is such that the user can only select either a column (Figure 2) or a row (Figure 3). However, in Mr Duke’s system, each line of characters is associated with a selection button so the user can choose which line (whether horizontal, vertical or at an intermediate angle) to select.
- 28 The examiner has argued that modifying the device described in BAKER to arrive at Mr Duke’s invention is something which would have been obvious to the person skilled in the art, based on his common general knowledge, and that the claims do not provide an inventive step as a result. The examiner also argued that the details specified in the other claims are either shown in BAKER, or are issues relating to the design of the interface, and do not therefore provide the required inventive step.
- 29 Mr Duke’s position was that his invention was not obvious. He pointed out that ensuring the security of passwords was a major global concern and that the computer industry had invested huge amounts of resources over the years to prevent identity theft. His evidence showed that there were numerous ways that a user’s password could be stolen and, in his view, there was no reason why the skilled person would single out BAKER as a starting point, particularly given it was published in 1995. He stressed that his invention was not a simple evolution of BAKER and that the move to the multi-direction selection buttons was not obvious.

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<sup>5</sup> You can view this application by going to [http://worldwide.espacenet.com/numberSearch?locale=en\\_EP](http://worldwide.espacenet.com/numberSearch?locale=en_EP) and entering the number above.

Step 4: Is the invention obvious?

- 30 In my view, Mr Duke's invention is not obvious. Although similar, there is nothing in BAKER to encourage the skilled person to modify it to provide selection buttons to enable the user to choose which line containing his character to enter as claimed for Mr Duke's invention.

**Conclusion**

- 31 I find that the claimed invention:
- (a) involves an inventive step (is not obvious) as required by section 1(1)(b)
  - (b) is excluded under section 1(2) because it relates to a computer program and to the presentation of information as such.

- 32 I have carefully reviewed the specification but do not think that any saving amendment is possible. I therefore refuse the application under section 18(3).

**Appeal**

- 33 If Mr Duke disagrees with my decision, he has the right to appeal it to the Patents Court. Under the Practice Direction to Part 52 of the Civil Procedure Rules, any appeal must be lodged within 28 days.

**MRS S E CHALMERS**

Deputy Director acting for the Comptroller