



PATENTS ACT 1977

APPLICANT Fisher-Rosemount Systems Inc.

ISSUE Whether patent application GB1115638.7 complies with section 1(2)(c).

HEARING OFFICER Ben Buchanan

DECISION

Introduction

- 1 This decision considers the issue of whether the invention claimed in patent application GB1115638.7 satisfies the requirement for patentability as defined by section 1(2)(c) of The Patents Act 1977 (“The Act”).
- 2 Patent application GB1115638.7 was filed on 9th September 2011 in the name of Fisher-Rosemount Systems Incorporated and is entitled “Methods and apparatus to manage process control search results”. This application claimed a priority date of 23rd September 2010 from US patent application number 12889068. The application was published as GB2483970A on 28th March 2012.
- 3 The application has been through four rounds of substantive examination and amendment where the Applicants (via their attorney Forresters IP LLP) have been unable to persuade the Examiner that the invention relates to patentable subject matter. A hearing was suggested in the Examiner’s report of 5th September and requested in the Applicant’s letter received 3rd December, accompanied by amended claims and supporting argument. A pre-hearing report issued on 20th December 2018 maintaining that the invention was excluded from patentability and noting that the most recent claims appeared to be novel and inventive, but also appeared to add subject matter beyond that disclosed by the application as filed.
- 4 Because the claims and the associated outstanding objections had changed since the hearing was requested, prior to the hearing I sought to clarify the matter to be heard and decided. I instructed the Litigation Clerk to write to the Applicant to state that I would consider whether the claims in question defined an invention which was patentable under section 1(2), but that I would not consider the (newly arisen) question of added matter beyond the extent necessary to decide patentability. Full consideration of compliance with section 76(2) would be for the Examiner to make if I found the claims met the requirements of section 1(2). Subsequently, skeleton arguments accompanied by new amended and auxiliary claim sets removing the alleged added matter were filed on 4th February 2019.

- 5 The claims filed on 4th February 2019 have not been considered by the Examiner. On the face of it these claims would also appear to be novel and inventive but if found to define non-excluded subject matter they will be referred to the Examiner for full examination.
- 6 The issue came before me at a hearing held by video conference on the 11th February 2019. The Applicant was represented by Mr. Russell Sessford of Forresters IP LLP who was observed by Stephanie Thomas. The Examiner Dr. Rob Valkass and hearing assistant Emma Porter also attended at the IPO.
- 7 Given that the claims on the basis of which the hearing had been suggested and requested had been subsequently amended and replaced several times, at the hearing I queried which version of the claims I was to consider. Mr. Sessford confirmed that the Applicant's request was that the hearing should proceed on the basis of the claims filed with the skeleton arguments, stating that the main request should be considered first and the two auxiliary requests considered only if the main request was found to be excluded. Mr. Sessford confirmed that all of the previously filed claims sets were to be disregarded. I am grateful to Mr. Sessford for this clarification and I am content to accept the claims filed on 4th February as the current formally filed claims, noting the auxiliary requests.
- 8 The original compliance date was extended as of right with a form 52 and fee to 26th December 2018 and was later requested to be extended by a further form 52 and fee to take it to 26th February 2019. An additional discretionary extension was discussed favourably at the hearing, and requested soon after, taking the current compliance date to 26th April 2019.
- 9 I confirm that I have considered all the correspondence on file.

The invention

- 10 The present invention relates to process control systems, and specifically to managing process control search results. Process control systems typically include one or more process controllers and input/output devices communicatively coupled to at least one operator workstation and at least one field device. The field devices may be for example valves, valve positioners, sensors, switches and transmitters and they perform process control functions within the process. The controllers receive signals indicative of process measurements made by the field devices. The controllers process this information to generate the control signals sent to the linked field devices to control their operation.
- 11 Information from the field devices sent to the controllers is made available to one or more applications in an operator workstation as runtime data. The runtime data is processed by the operator workstation to enable an operator to view data relating to the current operation of the process. Additionally, the applications on the operator workstations may access process documentation, event information, alarm information and/or help files that describe various aspects of the process control system. This runtime data and other reference data is typically spread over many different databases. The operator needs to be able to access relevant portions of this information, and have it presented to them in an accessible manner, in order to be able to make timely decisions relating to the control of the process.

- 12 Embodiments of the invention include an index manager which communicates with stored data (such as manuals etc.) and also communicates with a runtime data memory. The runtime data memory receives up-to-date runtime data from the controllers. The index manager is used to generate a search index database from the stored data and the runtime data, which can then be used by a search interface or engine in order to provide search results to an operator at a workstation. The context of the displayed search results is dependent on the context of the search request. The search results include runtime data from the operation of the process plant and this runtime data is dynamically updated in the displayed results, rather than being a static result “frozen” at the time of the search. The dynamic updating is carried out by updating the search index with up-to-date runtime data and applying rules to replace the “frozen” runtime data displayed. If something changes in relation to the runtime data displayed then the data displayed also changes.
- 13 The crux of the invention can be summarised as: context dependent display of search results including control parameters and updated associated runtime data.

The claims

- 14 The claims of the main request contain three independent claims (1, 14 and 22) which it was agreed at the hearing would stand or fall together. Claim 1 is repeated below:

1. A method to display process control search results via a user interface, the method comprising:

- receiving a search parameter from a user via a control panel part of an application or any other part of the application to view search results associated with the search parameter;
- searching a search index for control parameters that match the search parameter to form a set of matched control parameters, wherein the matched control parameters include control parameters that correspond to runtime data generated by a controller within a process control system, wherein at least a portion of the runtime data is stored via the search index;
- rendering and displaying, via the user interface, the set of matched control parameters and values of the corresponding runtime data via a first result panel or a second result panel based on whether the search parameter was received from the control panel part of the application or any other part of the application;
- receiving from the controller second runtime data to replace the runtime data;
- parsing the second runtime data based on a rule set;
- storing at least a portion of the second runtime data in the search index in response to a predetermined condition by replacing the runtime data with the second runtime data;
- prior to replacing each value of the runtime data, determining if each values of the second runtime data is displayed as the search results; and
- updating the each of the displayed search results with a value of the second runtime data by rendering each of the matched control parameters associated with a respective one of the values of the second runtime data for display via the application as the search results based on a determined display context.

The law

Section 1: Patentable inventions

- 15 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) 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.
- 16 In order to decide whether an invention relates to subject matter excluded by section 1(2), the Court of Appeal has said that the issue 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 (“*Aerotel*”) 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
- 17 The operation of the approach is explained at paragraphs 40-48 of the judgment. Paragraph 43 confirms that identification of the contribution is essentially a matter of determining what it is the inventor has really added to human knowledge, and involves looking at substance, not form. Paragraph 47 adds that a contribution which consists solely of excluded matter will not count as a technical contribution.
- 18 The case law on computer implemented inventions has been further elaborated in *AT&T/CVON*² (“*AT&T*”) which provided five helpful signposts to apply when considering whether a computer program makes a relevant technical contribution. In *HTC v Apple*³ (“*HTC*”), Lewison LJ reconsidered the fourth of these signposts and felt that it had been expressed too restrictively. The revised 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 (and others) and Macrossan’s Application* [2006] EWCA Civ 1371

² *AT&T Knowledge Ventures LP and CVON Innovations Limited v Comptroller General of Patents* [2009] EWHC 343

³ *HTC v Apple* [2013] EWCA Civ 451

- 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.

19 I asserted that the approach to determining patentability under section 1(2) was that set out in *Aerotel* and Mr. Sessford agreed. He also agreed that the *AT&T* signposts should be considered.

Argument and analysis

Application of the *Aerotel* approach to the claims under consideration

Step 1: Properly construe the claim

- 20 The claims of the main request are clear when read in light of the description. The analysis of the claim construction provided by Mr. Sessford in the skeleton arguments is helpful and is followed below. The Examiner's comments on claim construction relate to superseded claims, and so will not be repeated here.
- 21 "*A method to display process control search results via a user interface...*": the process control search results are clearly defined within the claim itself and further described in the application as filed. The invention is limited to the display of process control search results and so the method is tied to a control system in a process plant. The user may be the operator of the process control system and the user interface may be a graphical user interface of a computer program on a work station.
- 22 "*...receiving a search parameter from a user via a control panel part of an application or any other part of the application to view search results associated with the search parameter...*": this part of the claim defines at least two parts of the operator interface through which search parameters may be received (see figures 3 and 5 of the published application). The search parameter originates from the user.
- 23 "*...searching a search index for control parameters that match the search parameter to form a set of matched control parameters, wherein the matched control parameters include control parameters that correspond to runtime data generated by a controller within a process control system, wherein at least a portion of the runtime data is stored via the search index...*": a search index is searched using the search parameters to find matched control parameters. The phrase "at least a portion of the runtime data is stored via the search index" is construed as meaning that some of the runtime data is stored *in* the search index database.
- 24 "*...rendering and displaying, via the user interface, the set of matched control parameters and values of the corresponding runtime data via a first result panel or a second result panel based on whether the search parameter was received from the control panel part of the application or any other part of the application...*": the search

results, including the runtime data, are presented in a first or second panel of the user interface based upon the context of the search request.

- 25 “...receiving from the controller second runtime data to replace the runtime data; parsing the second runtime data according to a rule set;...”: further runtime data is received and used to replace the original runtime data according to rules.
- 26 “...storing at least a portion of the second runtime data in the search index in response to a predetermined condition by replacing the runtime data with the second runtime data;...”: at least some of the second runtime data is used to update the search index when a predetermined condition is met.
- 27 “...prior to replacing each value of the runtime data, determining if each value of the second runtime data is displayed as the search results;...”: it is determined if any of the displayed runtime data needs updating.
- 28 “...updating the each of the displayed search results with a value of the second runtime data by rendering each of the matched control parameters associated with a respective one of the values of the second runtime data for display via the application as the search results based on a determined display context.”: if an update is needed then the runtime data is updated (based upon the display context). In this step the search is not re-run but the matched control parameters are used to determine which displayed runtime data needs updating.

Step 2: Identify the actual (or alleged) contribution

- 29 Jacob LJ outlined the considerations to be applied when identifying the contribution made by the claims in paragraph 43 of *Aerotel* – the critical factors for the examiner to consider are emphasised:

“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.”
- 30 Mr. Sessford explained how the invention works as follows: “the invention relates to a process control system for a factory, refinery process or the like. The process control system has field devices which can monitor and/or control integers in the system, such as boilers and valves. The field devices are all connected to controllers, which are a bit like the central nervous system in that they perform local control routines which they have been instructed to do by the ‘brain’ of the process control system. The ‘brain’ of the process control system is an operator running applications on a workstation, which applications consider the whole process rather than the local operation of field devices. These applications provide the operator with a large volume of varied data. The operator can search for the information they need and can run searches in different parts of the application and depending where the operator made the search, the results will be shown in that part of the screen...”

- 31 ...the operator needs up-to-date information about the current operation of the plant. The runtime data is being displayed and the display is updated as the data changes, without the operator having to perform a new search. The search results displayed are dynamic". Mr. Sessford stated that the problem to be solved was how to get up-to-date information so that the process control system can be managed in a better way. For instance, a search for a parameter relating to a boiler temperature would return the relevant parameter and runtime data which would display the boiler temperature including any changes.
- 32 In the skeleton arguments, Mr. Sessford identified the contribution as: "A method of displaying process control search results including runtime data from a process controller. The search results being contextually tailored (i.e. by the part of the application from which the request is made). The search index being updated as the runtime data changes in a prioritised manner, and the displayed search results also being updated without re-running the search. The updated results providing more up-to-date runtime information to the operator for better management of the process control system."
- 33 In the application as filed, the problem said to be solved was stated as (on page 10 lines 26-28) "in process control systems, user, operators and/or engineers are sometimes required to have the most recent data to evaluate and make decisions regarding operating processes and/or field devices". The application as filed also states how the invention works (in page 11 lines 25-33) "Because the runtime data is generally dynamic, the methods and apparatus index a list of control parameters that are commonly and/or frequently used within a process control system so that any applications or graphical representations that access the control parameters may be displayed as search results with the most recent runtime data. Thus, the example methods and apparatus effectively index runtime data by indexing control parameters associated with the runtime data and propagating runtime data changes to displayed search results."
- 34 It appears from figure 2 and page 15 lines 5-22 that the controller 108 *pushes* runtime data to the runtime data memory 120. The controller receives data from field devices (it is not specified how) and generates runtime data for associated control parameters (page 14 lines 1-25). The index manager 103 periodically accesses the runtime data memory 120 and updates the search index database 122. Page 23 lines 2-11 confirms this interpretation. The search index is updated with control parameters according to a user configuration e.g. importance, frequency or recency (page 23 line 13 – page 24 line 14). Then "because the data manager 206 indexes runtime data as the controller 108 transmits the runtime data, the runtime data displayed as search results is substantially the most recent generated runtime data." (page 25 lines 3-5). The advantages are that the search results are updated automatically when relevant new runtime data is provided and the user benefits from making better decisions using the up-to-date information displayed.
- 35 In other words what has been added to the stock of human knowledge is prioritising and displaying up-to-date runtime information corresponding with search results for control parameters in a process control system.
- 36 On the basis of the contribution put to me at the hearing (as stated in his skeleton arguments), and supported by the description, I am broadly content with Mr.

Sessford's formulation. I should say that I think it is important to emphasise that the *runtime data is automatically updated and presented to a user* because the controller updates the runtime data memory when the data changes; the controller does not wait for a request from the search index, nor is the search re-run. In other words, the runtime data is automatically updated and sent to the search index, then stored and displayed in the appropriate context.

I therefore identify the contribution as:

Displaying process control search results including runtime data from a process controller, using a search index which is updated as the runtime data changes, so that the appropriate search results are automatically updated and displayed without re-running the search, the updated results providing more up-to-date runtime information to the operator for better management of the process control system

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

- 37 The third and fourth steps of the *Aerotel* test involve asking whether the identified contribution falls solely within the excluded categories, and then checking whether it is technical in nature. Given that the consideration as to whether the contribution is technical in nature has a direct bearing on whether it falls solely within excluded subject matter, and the arguments that have been put before me in this case, it seems appropriate to consider these two steps together.

Program for a computer

- 38 It is common ground that the invention is a computer-implemented one and that the contribution takes the form of a computer program running on conventional hardware. Consequently my consideration of excluded subject matter is under section 1(2)(c). Mr. Sessford confirmed that the hardware and sensors used in the apparatus of the invention were not new.
- 39 Using the guidance from the *AT&T* signposts for assistance, the question is whether the contribution resides solely in a computer program or whether it has a technical nature which takes it outside of the exclusion of section 1(2)(c) of the Act.
- 40 Mr. Sessford firstly referred to signpost one from *AT&T* "*i) whether the claimed technical effect has a technical effect on a process which is carried on outside the computer*" and referred to EPO Boards of Appeal decision T115/85⁴, which was explicitly referred to in *AT&T*, *Symbian*⁵, *Aerotel* and *HTC*. Mr. Sessford noted that this decision says (at paragraph 7 of page 5) that "generally the board takes the view that giving visual indications automatically about the conditions prevailing in an apparatus or system is basically a technical problem". He stated that although not binding on the UK IPO, this widely referenced decision should be considered to be persuasive. Mr. Sessford commented that this approach has been recently followed in UK IPO decision BL O29/19⁶ in which the Hearing Officer stated in paragraph 26

⁴ T115/85 IBM "Method of decoding phrases and obtaining a read out of events in a text processing system"

⁵ Symbian Ltd's Application [2009] RPC 1

⁶ BLO/029/19 General Electric Company "Monitoring and diagnosing generator operation".

that “it is trite law that giving visual indications automatically about conditions prevailing in an apparatus or system is basically a technical problem”. Mr. Sessford considers that the present invention provides information about what is going on in a process control system so that the user can see the most up-to-date information automatically. He admits that there is not a display of a direct instruction for the operator to do anything specific, but that a specific instruction is not essential to satisfy the first signpost. The operator is there to control and manage the process plant and can do that better with the automatic provision of up-to-date information.

- 41 In the Examiner’s pre-hearing report of the 20th December 2018, which did relate to a different claim set but nevertheless is still relevant in parts, the Examiner stated (in paragraph 35) that “while the user may indeed choose to take action based upon information presented to them by the proposed invention, and thus the user may subsequently choose to influence the process control system, nothing in the proposed invention has any direct effect on the process being carried out by the process control system” and referred to EPO Boards of Appeal decision T1670/07⁷ and the “broken technical chain fallacy”. The “broken technical chain fallacy” is shorthand for the fact that attempting to derive a technical effect from a user’s actions does not introduce a technical effect into the contribution. The Examiner went on to conclude that signpost (i) therefore does not point towards the contribution being technical.
- 42 At the hearing Mr. Sessford referred to the “broken technical chain fallacy” noting that it had not been incorporated into UK law or construed by the UK courts. Additionally, it had not been followed by the UK IPO in decisions BL O/312/15⁸ and BL O/246/17⁹, both of which require a user to act upon information output by a computer for the implementation of the method; that is they required a user to be present in the “technical chain”.
- 43 In the application in suit, the updated runtime data is automatically obtained and displayed to the operator and this enables the operator to make more informed decisions about controlling the process. Although the controlling step is not a part of the contribution, the updated information enables the operator to exercise better control. Mr. Sessford thus argued that signpost (i) is satisfied and the method of the application makes a relevant technical contribution.
- 44 In BL O/112/18¹⁰ (at paragraph 27) the Hearing Officer concluded that one can step back from the actual advance over the state of the art and identify the field of endeavour when considering what the inventor has added to the stock of human knowledge. If that field of endeavour is a technical one, as in *Halliburton*¹¹, then the invention may be a patentable one under section 1(2). For this application, the field of endeavour may be considered to be “automatically giving visual indications about runtime data in a process control system”. This is undoubtedly a technical field of endeavour.

⁷ T1670/07 Nokia “Shopping with mobile devices”

⁸ BL O/312/15 The Boeing Company “Fleet performance optimization tool enhancement”

⁹ BL O/246/17 Fisher-Rosemount Systems “Configurable user displays in a process control system”

¹⁰ BL O/112/18 Landmark Graphics Corporation (Various)

¹¹ *Halliburton Energy Services, Inc. v Smith International (North Sea) & Ors* [2005] EWHC 1623 (Pat) (21 July 2005)

- 45 Mr. Sessford also argued that signpost (ii) of the *AT&T* signposts overlaps with signposts (iii) and (iv) and provided an additional argument to be considered which relates to all three signposts in some respects. Signpost (ii) reads: “*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*”.
- 46 In summary, Mr. Sessford stated that the IPO has deviated from the case law in the application of this signpost, referring to MOPP 1.38.2 and BL O/347/10¹², especially in respect of the term “architecture” which he stated as being interpreted by the UK IPO as “computer system architecture” as might be understood by a computer scientist or electronic engineer. Mr. Sessford argued that inventions at the level of “computer system architecture” as interpreted by the UK IPO would be implemented by hardware and not a computer program and so there seems little purpose to a signpost set at this level. He also argued that the phrase “*that is to say*” should be understood to mean “*in other words*” whereas in his opinion, the UK IPO is wont to interpret it as “*and*”. We discussed, and I agreed with Mr. Sessford, that a broad actual technical contribution would not be rendered less technical by a narrow claim to a specific use. For example, a technical effect which operated at the architectural level of a computer (and which thus provided a better computer as in *Symbian*) would not necessarily be rendered “non-technical” by a claim limiting its use to within the field of business. Of course, much depends upon how such a claim would be construed, but I am comfortable with the principle that a technical effect at the architectural level would be no less technical processing some data and applications than others. In other words, if the technical effect really is architectural, it may be realised irrespective of the application software being run. In the present application, the description and claims are limited to retrieving runtime data within a process control system and the description supports no other use. If the technical effect in the present application were at the architectural level of the computer, then the limitation to its use within a process control system would, I agree, not alter the technical nature of the contribution.
- 47 Following this, Mr. Sessford then suggested that in a broad sense the contribution was the dynamic updating of search results and that the limitation of the application to a process control system did not alter the contribution. I disagree. I do not believe that the contribution of the present invention is at the architectural level of the computer. There is no suggestion in the patent application that the allocation of computing resources and their operation – how the computer runs internally – is different. The difference is the use of those resources under the control of the software applications (e.g. index manager and search interface) being run. The benefits are particular to those applications. The broad contribution is the automatic provision of visual indications about the conditions prevailing in a system within a technical field of endeavour. The arrangement of appropriately programmed hardware is essential to the invention and its operation, but the contribution of the invention, as determined above, is outside the computer. Signpost (ii) is not satisfied.
- 48 I consider the contribution to provide a technical effect on a process which is carried on outside the computer, namely giving visual indications automatically about the

¹² BL O/347/10 Intuit Inc. “Method and apparatus for facilitating a persistence application programming interface”

conditions prevailing in a process control system. In my opinion the latter is a technical field of endeavour and consequently the requirement from *Aerotel* to meet section 1(2)(c) that the invention provide a technical contribution is satisfied. Finally, I note that although signpost (v) was not discussed, the problem solved by the invention is regarded as “basically a technical problem” by the EPO Boards of Appeal in decision T115/85 which also points towards the contribution being technical in nature.

- 49 Mr. Sessford worked through the two auxiliary claim sets filed on 4th February 2019. However, I have found that the main request has a technical contribution and is therefore not excluded so I do not need to consider the two auxiliary requests.

Conclusion

- 50 I find that the claimed invention is not excluded from patentability under section 1(2)(c). However, the claims were filed with the skeleton arguments dated 4th February 2019 and therefore have not yet been examined.
- 51 I remit the application to the Examiner for full examination of the amended claims.

Appeal

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

Ben Buchanan

Deputy Director, acting for the Comptroller