



PATENTS ACT 1977

APPLICANT	ABB Technology AG
ISSUE	Whether patent application GB1306492.8 complies with Section 1(2) of the Patents Act 1977
HEARING OFFICER	B Micklewright

DECISION

Introduction

- 1 International patent application WO 2012/045326 A1 was filed on 8 October 2010 under the Patent Co-operation Treaty (PCT). It was published on 12 April 2012 and entered the GB national phase as GB1306492.8 on 10 April 2013. It was republished as GB2499531 on 21 August 2013.
- 2 The examiner has consistently maintained that the invention as defined by the claims relates to subject matter excluded from patentability under Section 1(2) of the Patents Act. Despite several rounds of correspondence, the applicant has been unable to persuade the examiner otherwise. The issue therefore came before me at a hearing on 1 April 2019. The applicant was represented by Michael Handley of Marks & Clerk LLP.

The invention

- 3 The opening paragraph of the description provides an overview of the invention and its purpose. The invention is said to relate to a method and system for the propagation of amendments in the configuration of technical equipment, e.g. transformers, generators, mills or other automated machines or devices, by means of transfer of an amended configuration of a master comprising a specific apparatus or device to a number of duplicates of said master. Mr Handley explained that essentially the invention was about the control of devices in an industrial plant, for instance a chemical plant, with multiple boilers or similar equipment. The main embodiment in the description appears to relate to boilers.
- 4 Broadly speaking the invention arises from a desire to change the configurations of all items of similar equipment, for instance all the boilers, across the system. The invention accounts for the fact that whilst the equipment is similar there may well be some differences between individual pieces of equipment. In general terms the method involves identifying a master item of equipment, performing a configuration for the master, identifying and accounting for any conflicts between the master and

the other items of equipment, and then propagating the configuration change to duplicates of the master.

- 5 The application contains two independent claims, relating to a method and a system respectively:

1. A method for propagation of changes in the configuration of technical equipment, by means of transfer of a changed configuration of a master comprising a specific apparatus or device to one or more duplicates of said master and for detection of conflicts with the propagation of changes wherein the propagation from the master to the at least one duplicate is executed by transferring a selected subset of the configuration of the master including the amendments,

wherein all or some of the changes which have been done with the master are propagated from the master to the at least one duplicate in a semi-automated or fully automated manner wherein possible conflicts are indicated automatically by means of graphic or textual display, and

wherein the propagation of changes with the master comprises the following three steps:

- a. matching wherein master and duplicate or duplicates are analyzed to identify which objects in the duplicate have been copied from which object from the master and thus correspond to each other;*
- b. comparing wherein different types of changes, e.g. structural changes are considered and checked for possible conflicts and*
- c. synchronizing wherein it is decided by the user which changes are applied to the duplicate in order to synchronize the duplicate with the master.*

8. A system for propagation of changes in the configuration of technical equipment wherein two groups of objects are compared where the second group has been created by copying the first objects but after copying one or both groups of objects have been changed wherein

- a. a user or the system identifies roots of master and duplicate to a matching step;*
- b. then the system identifies matching objects in the first group and in the second group for comparison and synchronization and*
- c. detects possible conflicting changes in the first group and the second group if any.*

The Law

- 6 Section 1(2) says that certain things are not inventions for the purposes of the Act (emphasis added):

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.

- 7 The test of determining whether an invention relates to one of these things was laid down by the Court of Appeal in *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application*¹. The four steps of the test are:

(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.

- 8 Subsequently, the Court of Appeal in *Symbian*² made clear that the *Aerotel* test is not intended to provide a departure from the previous requirement set out in case law, namely that the invention must provide a "technical contribution" if it is not to fall within excluded matter.

- 9 Guidance on whether a computer implemented invention makes a technical contribution was provided by the Court in *AT&T/CVON*³. This guidance is set out in the form of five signposts. These signposts were reformulated in *HTC v Apple*⁴ in and read as follows:

¹ *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371

² *Symbian Ltd's Application* [2009] RPC 1

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

⁴ *HTC Europe Co Ltd v Apple Inc* [2013] EWCA Civ 451

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

ii) Whether the claimed technical effect operates at the level of the architecture of the computer; that is to say whether the effect is produced irrespective of the data being processed or the applications being run.

iii) Whether the claimed technical effect results in the computer being made to operate in a new way.

iv) Whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer.

v) Whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.

Applying the Aerotel Test

Step 1 – properly construing the claim

- 10 There are a number of issues in the claims which make the task of construing them considerably more onerous than it ought to be. I sought to clarify these points at the hearing and I am grateful to Mr Handley for his comments in this regard.
- 11 Before starting to look in detail at the claims I will first make a general observation. Independent claims 1 and 8 relate respectively to a method and a system but they are cast in quite different language and as such it is by no means clear that they are in direct correspondence.
- 12 One thing that claims 1 and 8 do agree upon is that they are directed towards a method and system for propagation of changes in the configuration of “technical equipment”. On the face of it the term is very general in nature. The originally filed claims included the phrase “e.g. transformers, generators, mills, and other automated machines and devices”, which was removed at the request of the examiner for the sake of clarity. Even though this phrase no longer appears in the claims it is very clear to the skilled reader from the description that the invention is directed towards the sort of physical equipment and machinery that is found in production plants and I will construe the phrase “technical equipment” accordingly.
- 13 Claims 1 and 8 are also share the phrase “changes in the configuration” of technical equipment. This also needs some analysis as it is not clear that the claims actually require that the configuration of equipment is changed. Having carefully considered the claims and description and in view of Mr Handley’s response to that question at the hearing it is clear to me that they do not. The claims relate to manipulating the data files which represent the configuration of the technical equipment; they do not extend as far as actually using those data files to change the configuration of the equipment. It is also necessary to consider the nature of the changes to the configuration that are encompassed. I must say that I have not found the description and drawings to be particularly illuminating on this point. Figure 2 shows, in an embodiment of the invention, the sort of changes that might be made to a configuration file but this does not help me as it is not at all clear what these changes

represent. Could it, for instance, encompass changing the tag number or name of a piece of equipment, or the format in which information about the equipment is displayed to a user? Mr Handley put it to me that the person skilled in the art would readily understand the specification to teach that the purpose of the data files is to control the equipment and so the only sort of configuration changes encompassed are those which would necessarily affect the operation of the equipment. There is some evidence in the specification which supports this view – the discussion of the prior art refers to optimising and testing a configuration of a piece of technical equipment which only makes sense if the configuration changes make a difference to the way the equipment operates. On the other hand it is not clear from, for example, Figures 4 and 5 that the changes are limited in this manner. Taking into account all the disclosure in the specification, on balance I think Mr Handley is right; the correct way to construe “changes in the configuration” is that it relates to changes which would, if applied to the equipment, actually affect the way in which the equipment operated.

- 14 Construing the phrases “technical equipment” and “changes in the configuration” is of course crucial to an understanding of the fundamental nature of the invention, but in order to properly construe the claims I must look into the detail of the claims. I will deal with claim 1 first.
- 15 Claim 1 refers to a “master” and “duplicate”. The opening portion of the claim says that a master comprises “a specific apparatus or device”. By “apparatus or device” I have no doubt that the applicant means a piece of technical equipment. Consistency of terminology would have helped here. But the “master” is not actually a piece of equipment, as an initial reading of the claim might suggest. As I have already set out above, the invention is all about manipulating data files which represent the configuration of technical equipment. I therefore construe this portion of claim 1 to mean that a “master” data file *represents* a specific piece of technical equipment. What is clear from claim 1 though is that changes made to the master are “propagated” to the duplicate, or duplicates. A “duplicate” is a data file representing the configuration of another piece of technical equipment which is similar to the specific piece of equipment. Somewhat unhelpfully the claim is repetitive and uses a variety of terminology for the propagation of these changes, for instance “transfer of a changed configuration of a master...to one or more duplicates” and “transferring a selected subset of the configuration of the master including the amendments”. In particular step c) of claim 1 describes the propagation of the changes as “synchronizing...the duplicate with the master” and “changes are applied to the duplicate”. As I understand it all this terminology essentially relates to the same feature.
- 16 Claim 1 also recites that not all of the changes made to the master are propagated to the duplicate. Once again a variety of terminology within the claim somewhat obscures this. Firstly the claim recites that a “selected subset” of the configuration of the master is propagated to the duplicate(s). Secondly the claim says that “all or some” of the changes are propagated from the master to at least one duplicate, and finally the claim sets out that a user must decide “which changes are applied”.
- 17 Claim 1 plainly includes an internal contradiction. It recites that the changes are propagated from the master to the duplicate in a “semi-automated or fully automated manner”. There are clearly two options here. Mr Handley explained to me that the

two options relate to the degree of user intervention: in the case of fully-automated operation a computer makes the decision as to which changes are propagated to the duplicate, whereas in the semi-automated case the user is given an opportunity to approve, or alternatively override, the computer's suggestion. The issue here is that claim 1 explicitly includes the step of indicating conflicts to a user on a display, and step c) requires user intervention in response to the display. As such claim 1 is clearly at odds with a fully-automated method. This is an issue that will need to be resolved through amendment if this application is to proceed to grant. For my purposes I shall disregard the reference to "fully automated" when construing the claim.

- 18 The claim also refers to "possible conflicts" and "possible conflicting changes". There is nothing in claim 1 and very little in the description which explains what is meant by possible conflicts. Mr Handley explained it to me like this; a possible conflict is something which arises when there is a difference between the master and duplicate which causes the configuration of the master device not to be applicable to the duplicate. This strikes me as the only sensible way to construe this phrase, and it is entirely consistent with the example given in the first full paragraph on page 10 of the description.
- 19 Claim 1 defines three steps, labelled a),b) and c), which form part of the process of propagating the changes from the master to the duplicates. The third of these, the "synchronizing" step, I have already discussed above; it is the step in which those changes which are approved by the user are propagated from the master to the duplicate. The first two steps, defined as "matching" and "comparing" respectively, require a little explanation.
- 20 The "matching" step relates to comparing a master data file with a duplicate data file and identifying which data objects in the duplicate file have been previously copied from the master file. The reason for this is that an object in the duplicate which has been copied is clearly in correspondence with its counterpart in the master, so any change to that object in the master should potentially be made to the corresponding object in the duplicate.
- 21 The "comparing" step of claim 1 is somewhat more difficult to follow, not least because it is unclear how it follows on from the "matching" step and it is not clear from the claim what is to be compared with what. As I understand it, with reference to the description, the method involves comparing one or more objects in the duplicate with the corresponding object(s) in the master. But there is more to the comparing step than this; the claim says that "different types of changes, e.g. structural changes are considered and checked for possible conflicts". What are these "different types of changes" of which "structural changes" are an example? Again, looking to the description, the sorts of changes that the applicant has in mind are the addition or deletion of data objects in the master or duplicate files. By "structural" they mean the structure of the data file, not the physical structure of a piece of technical equipment. So, in summary, the point of the comparing step is to consider any changes which have been made in the master and to check if any of those changes might possibly cause a problem (a conflict) if propagated to the duplicate.

- 22 As I have mentioned above, independent claims 1 and 8 may not be in direct correspondence. There are some similarities, of course, but there are also some apparent differences. For a start, claim 8 is shorter which might suggest it is broader. I will therefore look at the details of claim 8, and particularly focus on those parts of it which appear to be different to claim 1.
- 23 Whilst there is a reference to “master and duplicate” in claim 8 there is nothing which clearly says that changes which have been made to a master are propagated to the duplicate. In fact, the claim does not provide any explanation of what a master and duplicate are, and how they relate to anything else mentioned in the claim. But the opening portion of claim 8 does refer to “two groups of objects” wherein a “second group has been created by copying the first objects...”. It seems clear to me that the “first objects” must be construed as objects in the master, and likewise that the “second group” must be construed as objects in the duplicate. The claim would certainly benefit from an amendment to make this clear. This opening portion of claim 8 makes clear that the second group of objects (the duplicate) is initially created by having been copied from the first group of objects (the master). This is something which features in claim 1, in the matching step a), as discussed above. The claim goes on to say that “after copying one or both groups of objects have been changed”. On the face of it, this means that either the master, the duplicate, or both, are changed. So claim 8 encompasses the possibility that the master is not changed. This is not consistent with my understanding of the invention as set out in the description, or with claim 1, which is that the invention is all about propagating changes made in a master data file to a duplicate data file. I have therefore construed the claim to mean that after the second group (the duplicate) is created, by copying from the first group (the master), the first group is changed and possibly also the second group.
- 24 Claim 8 includes the step, labelled a), which reads “a user or the system identifies roots of master and duplicate to a matching step”. This strikes me as obscure to say the least, particularly the phrase “to a matching step” which I simply do not understand. Again I have to turn to the description and drawings to get some idea of what this step might mean, as the claim provides me with no assistance. With reference to figures 1 and 2 it is apparent that the objects in the master and duplicate files may be arranged in a hierarchical fashion, and so what I think this step is trying to say is that the user or the system identifies a root of a tree-like structure of data objects in a duplicate which corresponds to a root of a tree-like structure of data objects in the master. This is a step that simply does not appear in claim 1. It is a step which appears to be unconnected to the subsequent step.
- 25 Step b) in claim 8 says that the system “identifies matching objects in the first group and the second group”. On the face of it this is somewhat broader than the “matching” step in claim 1 in that claim 8 gives no indication as to what constitutes a match. But, read in the light of the description, I consider that this refers to the same matching step that claim 1 defines and I have construed it as such.
- 26 Step b) also says that this matching step is “for comparison and synchronization”. Unhelpfully neither term is defined in the claim, nor referenced later in the claim. “Comparison” is the analysis of the objects which have been identified as matching in order to detect possible conflicts. “Synchronization” must be understood as the process of propagating changes from the master to the duplicate. It is important to

note that step b) in claim 8 does not include the steps of “comparison and synchronization”; it simply explains the reason that the “matching” step is performed.

- 27 Claim 8 concludes by defining, in step c), that the system detects possible conflicts. Again this is broader than the similar step in claim 1.
- 28 It is perhaps just as important to note a feature that claim 8 does not include. There is no reference to displaying possible conflicts to a user to provide an opportunity to decide which changes in the master should be applied to the duplicate.
- 29 Finally, I note that there is no explicit step of actually propagating any changes, or to put it another way there is no actual synchronization of a duplicate with a master. But claim 8 is “a system for propagation of changes” so it must have the capability of propagating changes. However, the lack of explanation of “master” and “duplicate” and the omission of any detail of the “synchronization” step mean that it is far from clear that the system of claim 8 is required to propagate changes from a master to a duplicate. I think it is clear, though, that this is what the applicant intended and for the purpose of considering whether the invention is excluded I will construe it as such.
- 30 Properly construing claims 1 and 8 has involved a considerable amount of effort, the sort of effort which places an undue burden on the interested skilled reader. In summary, the claims are not in direct correspondence, and it is not a simple case of claim 8 being broader than claim 1 since it contains a feature not present in claim 1. Use of terminology is inconsistent both within the claims and between the claims. Claim 1 includes an internal contradiction and is unnecessarily repetitive. And the relationships between the various steps and features defined in the claims are by no means clear. Nevertheless, despite these difficulties, I have been able to sufficiently construe the claims for the purposes of determining whether the invention relates to a computer program as such.
- 31 Mr Handley indicated at the hearing that the applicant would be happy to consider making suitable clarifying amendments to the claims in the event that I found in their favour on the excluded matter point. Such amendments would certainly be necessary.

Step 2 – identify the actual contribution

- 32 Jacob LJ outlined the considerations to be applied when identifying the contribution made by the claims 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.”

- 33 The problem said to be solved relates to efficiently optimising the configuration of a piece of technical equipment in a production plant. It works by utilising the configuration of a similar piece of technical equipment. It does not do so blindly but

rather it appreciates that there may be reasons why some of the configuration for the one piece of equipment might not be appropriate for the other. The advantages are that each piece of equipment does not need to be configured, and then tested and optimised, from scratch, but rather changes from one piece of equipment can be simply and efficiently propagated to other pieces of equipment.

34 The examiner has assessed this contribution as

The analysis of a master device and duplicate device, in order to identify objects to be copied to the duplicate, the comparison of changes required, and the checking for conflicts; thereby enabling the propagation of changes by synchronizing the duplicate with the master.

35 Mr Handley, in his skeleton argument, characterises the contribution as

A method for propagation of changes in the configuration of technical equipment by analysing a master and duplicate device, in order to identify changes to be copied to the duplicate, the comparison of changes required, and the checking for conflicts, thereby enabling the propagation of changes by synchronising the duplicate with the master.

36 There is much in common; both the examiner and Mr Handley agree that the contribution includes the idea of a master and duplicate and involves checking for conflicts before synchronizing the duplicate with the master. But what Mr Handley's contribution adds is the purpose of the invention, i.e. the invention is directed towards the configuration of technical equipment. I am not convinced that either assessment of the contribution quite gets to the heart of what the invention does, or how it works.

37 I would identify the contribution common to the two independent claims, as I have construed them above, as follows:

Propagating changes in the functional configuration of physical equipment of the type found on a production plant from a master configuration data file to a duplicate configuration data file where the master represents one piece of physical equipment and the duplicate has been copied from the master and represents a second piece of similar physical equipment, wherein corresponding data objects in the master and duplicate files are matched up, any changes to those objects in the master are identified, and a conflict check is made prior to propagating the changes from master to duplicate to identify if any of those changes might be inappropriate to make to the duplicate.

Steps 3 and 4 – ask whether the contribution falls within excluded subject matter, and check whether it is technical

38 There can be no doubt that this is a computer implemented invention but that does not necessarily mean that the contribution falls within excluded subject matter. As Mr Handley pointed out to me, quoting HHJ Birss in *Halliburton Energy Services Inc's application*⁵, “[a] computer programmed to perform a task which makes a

⁵ *Halliburton Energy Services Inc's Applications* [2012] RPC 129

contribution to the art which is technical in nature is a patentable invention and may be claimed as such.”

- 39 The *AT&T* signposts can provide useful guidance on deciding whether a computer program makes a technical contribution. It is common ground that only the first of those signposts is relevant. Mr Handley’s argument is a simple one, namely that changes are made to the configurations of technical equipment and so there is a technical effect of a process which is carried on outside a computer. There is much force in this argument, but I must address one point. The contribution, as I have set out above, stops short of explicitly including a step of controlling the performance of the physical equipment. So is there actually any effect on a process carried on outside a computer? I believe that there is. There is only one reason for making the changes to the duplicate configuration file, and that is surely to apply that configuration to a piece of physical equipment to affect the way in which it functions. The first *AT&T* signpost therefore indicates that the contribution is technical in nature.
- 40 Having carefully considered the invention and all the arguments provided to me I am of the opinion that there is a technical contribution here. Taking a step back it is clear to see that the purpose of the invention is to enable a change in the configuration of a real item of equipment so as to have an actual effect on the way it operates. As such the contribution lies firmly in a technical field of endeavour and it is apparent that defining the configuration of that equipment is a technical process which has real world implications.

Conclusion

- 41 I find that the claimed invention is not excluded from patentability under Section 1(2)(c).
- 42 As will be clear from my discussion regarding claim construction there are quite a number of clarity issues with the claims which will need to be addressed prior to grant of a patent. I have therefore referred the application back to the examiner for further examination.

Appeal

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

B Micklewright

Deputy Director, acting for the Comptroller