

utilities management algorithms and attempt to provide solutions which have advantages over the prior art.

- 7 Each application concerns a different aspect of a method and corresponding apparatus that are all embodied in the same specific arrangement described and illustrated in figure 1 of the applications. The applications have almost identical descriptions. Also, each of the applications includes two independent claims, method claim 1 and apparatus claim 12, as well as claims to a program and a storage medium for that program which ultimately depend on claim 1.

GB1115873.0

- 8 Claim 1 of this application is embodied in figure 2 of the application and is set out below. It is characterised by process step (d):

A method of operating an electricity production and distribution network a resource through a network, the network comprising a plurality of consumer units and a plurality of provider units, each consumer unit being connected to one or more provider units in the network, each consumer unit being a user of electrical power and being associated with a desired amount of electrical power, each provider unit being a provider of electrical power and being associated with a power production limit, the method comprising:

performing one or more times a first process, the first process being a process of performing step (a) followed by step (b); wherein

step (a) comprises selecting a previously unselected consumer unit from the plurality of consumer units, thereby providing a currently selected consumer unit;

step (b) comprises performing one or more times a second process, the second process being a process of performing (c) followed by step (d);

step (c) comprises selecting a previously unselected provider unit from the plurality of provider units thereby providing a currently selected provider unit, the currently selected provider unit being connected in the network to the currently selected consumer unit; and

step (d) comprises, from the currently selected provider unit to the currently selected consumer unit, delivering an amount of electrical power, the amount of power being substantially equal to a minimum of a first value and a second value;

the first value is the power production limit associated with the currently selected provider unit; and

the second value is a difference between desired amount of electrical power associated with the currently selected consumer unit and a total amount of power previously delivered to the currently selected consumer unit.

GB1115871.4

- 9 Claim 1 of this application is embodied in figure 3 of the application and is set out below. It is characterised by process step (c):

A method of operating an electricity production and distribution network, the network comprising a plurality of consumer units and a plurality of provider units, each consumer unit being connected to one or more provider units in the network, each consumer unit being a user of electrical power and being associated with a desired amount of power, each provider unit being a provider of electrical power and being associated with a power production capacity, the method comprising:

for each provider unit, allocating a portion of the power production capacity of that provider unit to each of the consumer units to which that provider unit is connected, thereby providing a current production allocation for each provider unit;

performing one or more times a process, the process being a process of performing steps (a) to (c); wherein

step (a) comprises, for each consumer unit, generating a vector comprising one or more power requests, thereby providing a current vector for each consumer unit, each power request being a request for an amount of power to be delivered to that consumer unit from a provider unit connected to that consumer unit, and each power request being dependent on the current production allocation of that provider unit;

step (b) comprises, for each provider unit, determining whether the current production allocation of that provider unit satisfies the requests made of that provider unit in each of the current vectors; and

step (c) comprises, for each provider unit for which it is determined that the current production allocation does not satisfy the requests made of that provider unit in each of the current vectors, updating the current production allocation for that provider unit; and

from each provider unit and dependant on the current production allocation of that provider unit, delivering to a consumer unit connected to that provider unit an amount of electrical power.

GB1115872.2

- 10 Claim 1 of this application is embodied in figure 4 of the application and is set out below. It is characterised by process step (c):

A method of operating an electricity production and distribution network, the network comprising a plurality of nodes, the plurality of nodes comprising a plurality of consumer units and a plurality of provider units, each consumer unit being connected to one or more provider units in the network, each consumer unit being a user of electrical power and being associated with a desired amount of power, each provider unit being a provider of electrical power and being associated with a power production capacity, the method comprising:

for each node in the network, generating one or more vectors and/or matrices indicative of the desired amount of power or the power production capacity associated with that node, thereby providing a current set of matrices and/or vectors for each node;

performing one or more times a process, the process being a process of performing steps (a) to (c); wherein

step (a) comprises, for each node, selecting the nodes in the network that are connected to that node;

step (b) comprises, for each node, updating the current set of matrices and/or vectors for that node using the current set of matrices and/or vectors for each selected node that is connected to that node; and

step (c) comprises, for each node, calculating a vector of flows each element in the vector of flows representing a flow of an amount of power between nodes in the network, and the vector of flows being calculated such that the desired amounts of power of the consumer units and the power production capacities of the provider units are satisfied; and

delivering from a provider unit to a consumer unit connected to that provider unit, an amount of power dependent on a vector of flows.

- 11 Independent claim 12 of each application is an apparatus claim which corresponds to each of the method claims reproduced above. I have chosen not to reproduce the apparatus claims here as they appear to be so similar as to stand, or fall together.

The Law

- 12 Section 1(2) of the Patents Act 1977 sets out various things are not considered to be inventions for the purposes of the Act. It reads:

"It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of –

a)...;

b) ...;

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

d)...;

but the foregoing provision shall prevent anything from being treated as an invention for the purposes of this Act only to the extent that a patent or application for a patent relates to that thing as such."

- 13 These provisions are designated in Section 130(7) as being so framed as to have, as nearly as practicable, the same effect as Article 52 of the European Patent Convention, to which they correspond. I must therefore also have regard to the decisions of the European Patent Office Boards of Appeal that have been issued under this Article in deciding whether the present invention is patentable although I am not bound to follow them.

- 14 These provisions have been the subject of regular consideration by the UK courts. 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 its judgment in *Symbian*². In *Aerotel*, the court reviewed the case law on the interpretation of section 1(2) and approved a four-step test for the assessment of “excluded matter”. Those steps are:
- i. properly construe the claim;*
 - ii. identify the actual contribution;*
 - iii. ask whether the identified contribution falls solely within the excluded subject matter;*
 - iv. check whether the actual or alleged contribution is actually technical in nature.*
- 15 In its judgment in *Symbian* the Court 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. Thus in deciding whether the invention is excluded as a program for a computer *as such* I must ask whether it makes a technical contribution (though it does not matter whether I do that at step 3 or step 4).
- 16 The Courts have also provided additional guidance as to what constitutes a “technical contribution” in the form of the “AT&T signposts” which in their latest form³ read as follows:
- 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 a program makes a 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.*
- 17 In assessing whether the current invention is excluded or not, I will follow the *Aerotel* approach and use the signposts to assist in identifying any technical contribution.

Construe the claim

¹ *Aerotel Ltd v Telco Holdings Ltd and Macrossan’s Application* [2006] EWCA Civ 1371, [2007] RPC 7

² *Symbian Ltd’s Application* [2008] EWCA Civ 1066, [2009] RPC 1

³ As modified by the Court of Appeal in *HTC Europe Co. Ltd. v Apple Inc.* [2013] RPC 30

- 18 There appears to be no dispute between the examiner and the applicant as to how the claims should be construed. I will, however, review this for completeness.
- 19 As outlined above, each of the applications includes two independent claims
- 20 The independent claims in '873.0 are each characterised by process step (d). Both of the independent claims of this application are clear, although several points merit comment. I take the "minimum" in step (d) to simply mean the smaller of the first value and the second value. Neither of the independent claims specifies on what basis the consumer and producer units should be selected. However, dependent claim 4 and parts of the description make it clear that the selection of provider unit might be based upon the lowest cost, noting the comment on page 21 that cost may not be monetary and might be a value indicative of risk. As a minor matter there is redundant wording at lines 1 and 2 of claim 1 in 1115873.0: "a resource through a network".
- 21 The independent claims in '871.4 and '872.2 are each characterised by process step (c). All of the independent claims of these applications are also clear. In both of these applications the invention seeks to balance power demand with supply across a network. Although the independent claims do not make it clear on what basis this balance is to be struck, dependent claims 6 and 5, in '871.4 and '872.2 respectively, and each description makes it clear that cost is the determining factor and is used to generate a vector of power requests as required by step (c) of claims 1 and 12 of '871.4 or to calculate the vector of flows in step (c) of claims 1 and 12 of '872.2.
- 22 In all three applications cost seems to be the only basis for which there is an enabling disclosure for selecting a provider unit or calculating the relevant vectors.

Identify the actual/alleged contribution

- 23 Guidance on how to identify the contribution is given in paragraph 43 of the *Aerotel* judgment where the court accepted the proposition that identifying the contribution 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'.*
- 24 From reading the specifications it would appear that the general problem to be addressed lies in the algorithms used in energy and power management (E&PM) processes to increase the energy efficiency of sites that are connected to a power grid and also have one or more on-site sources of power. More specifically, the problem relates to using a centralised approach in combination with a large energy distribution network.
- 25 In general terms, the proposed solution is in the form of algorithms which provide a decentralised method for distributing energy within a network.
- 26 In an attempt to overcome the examiner's objections the claims have been amended to include references to electricity production and distribution networks.

- 27 Both the examiner and the attorney for the applicant have commented extensively on the question of the contribution in respect of each application and the comments are much the same for each application.
- 28 The examiner is of the view that the contribution in each case does not lie in the hardware described, which is presumed to be conventional, and that “delivering” in the claims has a purely business connotation. For the examiner the contribution in each case is set out in his letters of 3 December 2015 as “*A computer-implemented decision-making process for determining how a resource, electricity, is allocated throughout a network such that the power demands of consumers is satisfied while taking account of the production capacities of providers. Or, put another way, a resource allocation algorithm.*”.
- 29 For the applicant it is argued that the contribution is a more technically efficient way of distributing electrical power and that the invention has various advantages such as efficiency, reliability, flexibility and scalability.
- 30 The processes of energy generation and energy distribution themselves are not changed by the implementation of this invention. The hardware used appears to be standard and is in all likelihood the pre-existing energy networks. The energy would appear to be delivered by the method and apparatus of the inventions with the same inherent system losses as other state of the art energy delivery systems, as such this cannot be where any efficiency is found.
- 31 Whilst there is a reference on page 21 of the description (page 22 in GB 1115872.2) to the algorithms being ‘*relatively efficient*’, and reference on page 22 of the description to ‘*Further advantages that tend to be provided...include robustness to node loss, scalability and computational complexity.*’ it is not clear to me from the applications whether these advantages actually accrue from working the claimed inventions or what the relative efficiency might be.
- 32 The apparatus and /or energy network are entirely necessarily in order to work the inventions of the applications, but from reading the specifications in their entirety it is clear that there is nothing to suggest that the computational and distribution hardware, through which the invention is implemented, is anything other than conventional. Including references to the production and distribution network in the claims does not change the substance of the contribution. It is clear to me that the contribution for each of the independent claims lies in the computer implemented algorithms to manage the distribution of power through a network based on business variables- it is a computer implemented business method.

Ask whether it falls solely within the excluded matter

- 33 In his initial examination reports of 23 March 2015 the examiner states the view that “*providing as much power as possible ... from the cheapest of available sources amounts to nothing more than a method of doing business as such*”.
- 34 As noted above, the attorney alleges various technical advantages of the invention and raises an analogy with a motor car having an engine with computer controlled fuel injection and ignition systems. As before, I cannot find a basis for the technical advantages that are mentioned and I do not find the analogy helpful. Whilst I agree

that such a motor car might be patentable, it is also true that methods and apparatus for delivering electrical power are not inherently unpatentable. The question is whether the identified contribution falls solely within excluded matter.

- 35 The problem to be solved would appear to be a logistical problem driven by financial benefit. Furthermore, from reading the specifications it would seem that the basis for selecting the variables within each of the claimed inventions is financial or business based, with no clear teaching towards other reasons for selection.
- 36 I find the contribution to be nothing more than a computer implemented business method which is subject matter excluded from patentability by virtue of section 1(2)(c).

Check whether the actual or alleged contribution is actually technical in nature.

- 37 In his letter of 9 November 2015 the attorney suggests that “*decisions ... are not made on solely administrative grounds*”, but “*on other, technical, grounds*”. The nature of these technical grounds is not clear to me from the applications.
- 38 In the same letter the attorney also points to technical benefits such as ‘*the operation of the producers such as diesel generators is affected by decisions*’ and ‘*reduced wear on components of the electrical power producers and increased reliability of the power production, owing to both better decision making and to reduced system wear*’. I cannot see how such benefits are necessarily accrued by implementation of the inventions. The overall energy requirements of the network in question mean that any reduction in system wear for one producer is offset by increased system wear in for another producer. Also, I cannot see how implementation of the inventions results in increased reliability of power production.
- 39 Where an invention is a computer programme as such it is also appropriate to consider the AT&T signposts set out in paragraph 16 above.
- 40 The examiner and applicant seem to agree that signposts ii), iii) and iv) are not relevant since the invention does not concern the architecture or operation of a computer. That leaves signposts i) and v).
- 41 As I cannot identify a technical effect I fail to see how it could be carried on outside of a computer, also there is no technical problem solved by the inventions. In summary, the inventions are computer implemented business methods. They are not technical in nature.

Decision

- 42 I have found that the contribution made by the invention defined in each of the independent claims falls solely in subject matter excluded under section 1(2) as a computer implemented business method. I have carefully considered each of the specifications as a whole but can identify no amendment that could reasonably be

expected to form the basis of a valid claim. I therefore refuse the application under section 18(3).

Appeal

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

J PULLEN

Deputy Director, acting for the Comptroller