

**PATENTS ACT 1977**

APPLICANT Wally Tzara  
ISSUE Whether patent application GB1811470.2 is  
excluded under section 1(2)  
HEARING OFFICER H Jones

---

**DECISION**

**Background**

- 1 This patent application, entitled “Alerting device for anticipating trend reversal in the evolution of a quantity”, is the national phase of an international application filed in the name of Wally Tzara on 13 January 2017, claiming a priority date of 15 January 2016. The application was published as WO 2017/122173 and has subsequently been republished in the UK as GB 2561136.
- 2 During the international phase the European Patent Office issued an International Preliminary Report on Patentability which indicated that the invention, at least in the manner defined at that time, might not be capable of patent protection. The UK examiner shares that view and has maintained throughout the processing of the application that the invention relates to a computer program, a mathematical method and a method for doing business. Amendments to the claims and arguments from Mr Tzara have not persuaded the examiner otherwise.
- 3 Mr Tzara has requested a decision based on the correspondence already on file. It is clear that Mr Tzara feels that the examiner has ignored some of his arguments but having fully reviewed the correspondence I do not think this is a fair criticism. The law and practice in this area can be complex and as such it can sometimes be difficult for both examiner and applicant alike to fully understand and respond to each other’s arguments, and that seems to be the case here. I can categorically assure Mr Tzara that in reaching my decision I have taken full account of his observations in support of his application.

**The invention**

- 4 This application is about tracking the trend in the value of a quantity that varies over time, and more particularly about providing an alert when the onset of a reversal in a trend is identified. The method is really quite simple; the applicant readily acknowledges this but considers this simplicity to provide an advantage over complicated prior art mathematical modelling techniques. The method involves comparing the current value of a variable against two suitably chosen threshold

values in order to determine that there is a trend reversal and thus to provide an alert.

- 5 The underlying idea behind the method can be easily understood by comparing the following figures from the application:

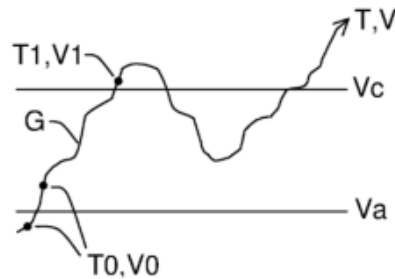


Fig. 3A

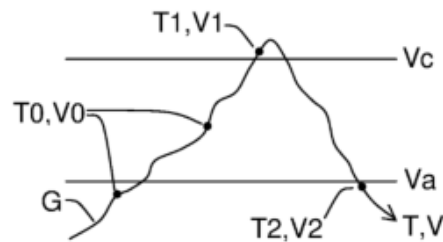


Fig. 3B

- 6 In the left-hand figure the value of the quantity  $G$  rises above a threshold  $V_c$ , and while it briefly falls back below  $V_c$  it does not fall below another, lower, threshold  $V_a$  (and in fact, it continues once again to rise). This indicates that a rising trend has not reversed despite a small temporary fall. In contrast, in the right-hand figure the value of  $G$  rises above the threshold  $V_c$  but then falls back more significantly, this time dropping below the lower threshold  $V_a$ . This is indicative of a trend reversal.
- 7 There are two independent amended claims. The first is directed towards a device, and the second towards a computer readable medium comprising program instructions.
- 8 The independent claims read as follows:

1. An alerting device for anticipating trend reversal in real-time whose processing means processes a set of numerical data events corresponding to a quantity varying over time in the field of meteorology, climatology, seismology, economy, population dynamics, finance, or cosmology and capable of producing a topological network, each event being assigned a value  $V$  from at least a primary value from said quantity assumed at an instant and the said instant, the processing means, provided that an initial value  $V_0$  and a group of chosen threshold values  $V_c$  and  $V_a$ , both based on the topological network from the numerical data, are all three different from each other and such that  $(V_c - V_0) * (V_c - V_a)$  is strictly positive, comprising:

comparing, starting from initial instant  $T_0$  corresponding to value  $V_0$ , value  $V$  with value  $V_c$ , and

if value  $V$  does not cross value  $V_c$ , starting over and comparing value  $V$  assumed at the following instant with value  $V_c$ , and

if value  $V$  crosses value  $V_c$ , comparing value  $V$  assumed at the following instant with value  $V_a$ , and

if value V does not cross value Va, starting over and comparing value V assumed at the following instant with value Va, and

if value V crosses value Va, triggering an alert.

13. A non-transitory computer readable medium embodying program instructions for execution by a data processing apparatus, the program instructions adapting the data processing apparatus for anticipating trend reversal in real-time to process a set of numerical data events corresponding to a quantity varying over time and capable of producing a topological network, each event being assigned a value V from at least a primary value from said quantity assumed at an instant and the said instant, the processing means, provided that an initial value V0 and a group of chosen threshold values Vc and Va are all three different from each other and such that  $(Vc-V0)*(Vc-Va)$  is strictly positive, comprising:

comparing, starting from initial instant T0 corresponding to value V0, value V with value Vc, and

if value V does not cross value Vc, starting over and comparing value V assumed at the following instant with value Vc, and

if value V crosses value Vc, comparing value V assumed at the following instant with value Va, and

if value V does not cross value Va, starting over and comparing value V assumed at the following instant with value Va, and

if value V crosses value Va, triggering an alert.

- 9 The two claims are broadly consistent with one another in that the device of claim 1 carries out exactly the same set of instructions as provided on the computer readable medium of claim 13. However, there are some differences which I shall discuss below.

### **The law**

- 10 Section 1(2) of the Act lists certain categories of subject-matter which are excluded from patent protection.

*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.*

- 11 The test for establishing whether a patent application relates to one of these excluded categories is set out in the Court of Appeal's judgement in *Aerotel*<sup>1</sup>. The steps of the test are as follows:
- (i) properly construe the claim;
  - (ii) identify the actual contribution;
  - (iii) ask whether it falls solely within the excluded subject-matter;
  - (iv) check whether the actual or alleged contribution is actually technical in nature.
- 12 In *Symbian*<sup>2</sup> the Court made clear that the question of whether a computer implemented invention is patentable has to be resolved by asking whether it reveals a technical contribution to the state of the art.
- 13 According to paragraph 46 of *Aerotel*, applying the fourth step may not be necessary because the third step should have covered the question. This is because a contribution which consists solely of excluded matter will not count as being a "technical contribution" and thus will not, as the fourth step puts it, be "technical in nature".
- 14 Lewison LJ provided five helpful signposts in *AT&T/CVON*<sup>3</sup> and *HTC v Apple*<sup>4</sup> which summarise where the Courts have identified a technical contribution in computer-implemented inventions. These so-called "*AT&T signposts*" are:
- 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 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.

## Arguments and analysis

### *Construing the claims*

- 15 It is first necessary to determine the scope of the independent claims, as only then will it be possible to assess whether the invention might include something within one of the categories for which patent protection is not available. The examiner's pre-

---

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

<sup>2</sup> *Symbian Ltd v Comptroller-General of Patents* [2008] EWCA Civ 1066

<sup>3</sup> *AT&T Knowledge Ventures LP, Re* [2009] EWHC 343 (Pat)

<sup>4</sup> *HTC v Apple* [2013] EWCA Civ 451

hearing report says that the claims are reasonably clear. I agree, but I will draw attention to a few relevant points.

- 16 The two independent claims are directed towards “anticipating trend reversal”. That suggests that the invention in some way forecasts or predicts the reversal of a trend in the value of a quantity at some future point in time. It is quite clear that this isn’t really what the invention does. As I have already explained above, Mr Tzara’s technique simply tracks the current value of a variable and compares it with a first and then a second threshold. It would perhaps be more accurate to say that the method identifies the onset of a trend reversal.
- 17 There has been some discussion between the examiner and Mr Tzara as to what the “quantity” is and what “V” represents. In broad terms, the “quantity” is something that has a value which varies with time, and “V” is the value of the quantity at a particular point in time. However, there is more to it than that. First, both independent claims add the requirement that the quantity must be one that is “capable of producing a topological network”. Secondly, claim 1 (but not claim 13) adds that the quantity is “in the field of meteorology, climatology, seismology, economy, population dynamics, finance or cosmology”. I will deal with these two points in turn.
- 18 The application itself says almost nothing about what is meant by a “topological network” other than that it is something that is constructed from values of the quantity and somehow allows a user to select appropriate thresholds  $V_a$  and  $V_c$ . However, the application does point towards a prior patent application by Mr Tzara which is said to explain what the term “topological network” means. The examiner has considered this and has concluded that it means no more than that the quantity must be one which is capable of producing a set of values suitable for predicting a trend reversal. I am not certain what limitation “capable of producing a topological network” imparts to the claims, if any, but absent any argument from Mr Tzara on this point I am content to accept the examiner’s assessment, not least because I do not think it has a material effect on my decision. As an aside, I note that the examiner, in his pre-hearing report, appears to suggest that it is impermissible for a patent application to rely upon information provided in another document. That is plainly not the case, though it might possibly be an issue had the document in question been unavailable at the earliest date of the application<sup>5</sup> (though that is not the case here).
- 19 The fields set out in claim 1 to which the quantity belongs are diverse. Equally within each field there will be many quantities which vary with time. This breadth has led the examiner to observe that the claims do not say what V represents, an argument that has clearly frustrated Mr Tzara. The application provides several concrete examples of what the quantity might be, including the atmospheric pressure at a given location, the temperature of the Earth and the temperature of the ocean (which appear to fall into the meteorology or climatology fields), the number of cosmic particles detected (cosmology) and the price of a barrel of crude oil or the number of shares exchanged and their price at a given time (finance). Claim 1 is not limited to any of these particular quantities, but while it is certainly true that the claims do not precisely specify what quantity V represents, it cannot be simply anything. It must be something which varies with time. It can only be a value in one of the fields set out in claim 1, though this does not apply to claim 13 which is much broader in scope, but that I suspect is an oversight on the part of Mr Tzara .

---

<sup>5</sup> See the [Manual of Patent Practice paragraphs 14.93-14.94](#)

- 20 Independent claims 1 and 13 both include the step of “triggering an alert”. The description and dependent claims provide some indication of the sort of alert that is envisaged – an audible warning, a visual warning on an output device such as an LCD monitor, or a signal transmitted to another computer system. The application also suggests some contexts in which such an alert might be used, including placing stock market orders or starting a burner or a pump.

*Identifying the contribution*

- 21 The second *Aerotel* step is to identify what contribution the invention makes to the stock of human knowledge. As the examiner points out, this is made somewhat more difficult in the absence of a complete prior art search and the deferral of any consideration of novelty and inventive step, but while it can be helpful to take account of what (if anything) makes the claims novel and inventive, it is still possible to consider what the applicant alleges the contribution to be, what problem is solved, how the invention works, what its advantages are, and the field(s) of technology in which it is used.

- 22 The examiner says that the contribution is:

A computer-implemented method of periodically comparing a variable V against a first threshold. If the first threshold is crossed, then V is periodically compared against a second threshold. If the second threshold is crossed, then a warning is provided.

- 23 The examiner’s contribution omits key features of Mr Tzara’s invention. The contribution must quite clearly relate to monitoring a trend in a variable which changes with time. The two thresholds mentioned in the claims are not arbitrary but are defined with respect to each other and with respect to an initial value of the quantity such that the onset of a reversal in a trend can be identified.
- 24 Furthermore, in the case of claim 1 the examiner’s contribution ignores the limitations that are placed on the quantity – namely that the variable is one which represents a value in the field of meteorology, climatology, seismology, economy, population dynamics or cosmology.
- 25 While the preferred way of implementing claim 1 might be through the use of a suitably programmed computer, the claim is not so limited. Claim 13 is, of course, cast in terms of a computer program. But when assessing the contribution, it is the substance of the invention rather than the form that is important. The invention may well use a computer program, but the program is just the means which causes an apparatus to track a variable, to identify a reversal of a trend, and then trigger an alert.
- 26 With those points in mind, the contribution common to the two independent claims may be better expressed as:

Identifying the onset of a trend reversal in a value of a quantity, by tracking the value and repeatedly comparing it against a first threshold, and if the first threshold is crossed then repeatedly comparing it against a second threshold, and triggering an alert if the value crosses the second threshold, wherein the two thresholds are defined so as to enable the identification of a trend reversal.

And in addition to that, for the invention defined in claim 1, the contribution also includes:

the variable is one which represents a value in the field of meteorology, climatology, seismology, economy, population dynamics or cosmology.

*Is the contribution solely within the excluded fields/is there a technical contribution?*

- 27 The examiner might be said to have adopted a “belt-and-braces” approach. He has objected that the invention falls into three of the excluded fields - a program for a computer, a method of doing business, and a mathematical method. It is of course true that a contribution can fall into more than one of the excluded categories; the history of hearing officers’ decisions and judgements of the courts is replete with examples where applications have been refused for relating to more than one of the exclusions. One consequence of the examiner’s approach here is that Mr Tzara has understandably been dragged into arguing his case on three fronts, which in turn has presented me with the challenge of disentangling his correspondence to get to the nub of his argument. But in summary Mr Tzara’s key point is that while his invention is useful in business, utilises mathematical operations and may be implemented on a programmed computer, it is more than any of these things *per se*. He considers that he has solved a fundamentally technical problem and has done so in a manner that must necessarily be technical in nature. The problem, as he sees it, is that prior methods of predicting changes in the value of a variable rely on mathematical modelling which is extremely demanding of processing power and requires the use of high-end computers. As I come to consider whether or not there is a technical contribution outside the excluded fields, I will endeavour to deal with the various specific points Mr Tzara has made to support his position.
- 28 Though they take opposing positions on the question of patentability, the examiner and Mr Tzara agree on one thing – that the nature of the data being analysed is irrelevant. Mr Tzara’s view is that predicting changes in data, whatever that data represents, is inherently technical. In contrast, the examiner’s view is that tracking trends in any sort of data is simply an analytical exercise of organisational or managerial significance and cannot possibly be technical in nature. To my mind there could be a difference in analysing trends in, for instance, the value of a seismic parameter and the value of a stock market index, but if Mr Tzara is correct that his invention is inherently technical irrespective of what the data represents then I will not need to address that point, so it makes sense to consider the merits of his arguments first.
- 29 The contribution, as I have defined it above, is not necessarily computer implemented, at least for claim 1. In fact, Mr Tzara has argued that it could be implemented using novel hardware, such as an arrangement of logic circuits. This is a possibility that is hinted at in the application, though only in the most general terms. Had Mr Tzara genuinely been able to claim a new piece of hardware then his invention might have trivially escaped the exclusions of section 1(2), but that is plainly not what he has invented. Despite arguing the novel hardware point, Mr Tzara accepts that his invention may be computer implemented, and in fact says that it is the preferred embodiment for ease of implementation and cost reduction. With that in mind he has leaned upon the *AT&T* signposts in an effort to demonstrate that the problem he has identified can only be solved using technical means.

- 30 His argument with regard to the first signpost is that there is a technical effect outside a computer because the quantity which is being tracked exists in itself irrespective of the computer. This amounts to saying that the data exists even if the computer does not, and that does not persuade me that the invention is inherently technical. In any case, the first signpost says that there must be an effect on a process which is carried on outside a computer, and I can see nothing in the contribution which points to such a process.
- 31 Mr Tzara's argument based on the second signpost is somewhat curious in that he readily admits that there is no technical effect at the level of architecture of the computer. His point is that his technique provides an alert in the event of a trend reversal regardless of the data that is being processed. That may be true, but merely saying that his method can track trend reversals in a variety of types of data is not nearly sufficient to satisfy the second signpost, which in simple terms may be thought of as being about the operation of the internal working of a computer. There is no element of the contribution which provides any sort of control over the operation of the architectural components of a computer.
- 32 In regard to the fifth signpost, Mr Tzara's argument is that his technique is superior to existing prior art mathematical modelling techniques and that the perceived problem has been overcome. Whether or not his technique is superior is a matter of opinion, but it is certainly an alternative approach to mathematical modelling techniques. The problem, as Mr Tzara describes it, is that the prior art techniques are heavily demanding of processing resources and energy use and require high-end computer equipment. Of course, there is a sense in which the limitations of a computer's processing capability and its energy usage can be seen as a technical problem, but that it not a problem which Mr Tzara has solved. On the contrary, Mr Tzara's idea is an example of circumventing the problem - he has simply avoided placing a heavy demand on a processor by programming the computer to perform a much less sophisticated technique.
- 33 Though Mr Tzara does not rely upon the third and fourth signposts I have nevertheless considered whether they might assist his case, but I do not see that they do. The computer does not operate in a new way, other than in the sense that running a different program makes a computer perform a different function, and while the program itself might be very effective and efficient it does not fundamentally make the computer more effective and efficient.
- 34 Having considered Mr Tzara's arguments, I am not persuaded that identifying the onset of a trend reversal in data, irrespective of what the data represents, is an inherently technical problem, and I am equally not persuaded that implementing such a technique on a suitably programmed computer necessarily reveals a technical contribution to the state of the art.
- 35 I now need to turn the point about the nature of the data being analysed. The fields of application of Mr Tzara's technique are clearly set out in claim 1. While claim 13 is not limited to those fields it is certainly the case that those field are within the ambit of the claim. There is a distinction that can be drawn between the listed fields of application. There are those which involve scientific data about the physical world which result from measurement or observation (meteorology, climatology, seismology and cosmology) and those which do not (economy, population dynamics and finance). I will consider these in turn, but not in that order.



- 36 One of the applications of Mr Tzara's technique is identifying trends in time-varying data in the field of finance. By way of example, the application teaches that a determined reversal of a trend in the price of an index might give rise to the buying or selling of a financial instrument. Mr Tzara has argued that his invention is not about buying and selling, and that just because his invention might be useful in the business world then that does not make it a method of doing business. However, it is well established that the business method exclusion does not merely cover methods of conducting an entire business operation but also covers tools which aid business transactions<sup>6</sup>. It is plain to see that what Mr Tzara has devised can be used as such a tool. That being the case I have no hesitation in concluding that it must fall within the business method exclusion.
- 37 While it would be sufficient for me to merely consider the application of Mr Tzara's technique to the analysis of financial data to conclude that the invention falls foul of section 1(2), I can easily address the fields of economy and population dynamics. The application provides no further details as to exactly what sort of quantities are envisaged, though in his correspondence Mr Tzara provides population size and natural resource availability as examples. It is well established that the business method exclusion is not restricted to the world of business and finance, but also embraces commercial, administrative, organisational and managerial activities. It is my view that the fields of economy and population dynamics are exactly the sorts of activities that are covered by the business method exclusion.
- 38 Since the breadth of the claims is such that they include tracking trends in financial, economic and population dynamics data within their scope it is my opinion that they are excluded from patentability as a business method, one which is undoubtedly a computer implemented business method in any practical implementation.
- 39 However, while that is the conclusion of my decision, I cannot stop there. The invention, as currently claimed, is not capable of patent protection for the reasons I have outlined above, but would it make a difference if the claims are limited to providing an alert in response to determining a trend reversal in scientific data (meteorology, climatology, seismology and cosmology) rather than non-scientific data (finance, economy, population dynamics)? In other words, does the nature of the data being analysed make any difference?
- 40 The examiner seems firmly of the view that tracking trend reversals in any type of data is something which falls within the exclusions of section 1(2), even if the data is scientific data, specifically in the fields of meteorology, climatology, seismology and cosmology in this instance. Accordingly, he says that amending claim 1 to remove the references to finance, economy and population dynamics would not change his view on the allowability of the claim. In fact, the examiner goes even further and says that there is nothing in the specification would result in an allowable claim.
- 41 There is instinctively a hint of something technical about an invention which relates to triggering an alert as a result of analysing data obtained from observations or measurements about the physical world. In the case of *Protecting Kids the World Over (PKTWO) Limited*<sup>7</sup> in the Patents Court, Floyd J found that an invention relating to an alarm for alerting a user to the fact that inappropriate content is being processed within a computer was not excluded by section 1(2). He says at paragraph

---

<sup>6</sup> See paragraphs 63-70 of *Aerotel* [2007] RPC 7

<sup>7</sup> [2011] EWHC 2720 (Pat)

34 that the concept *“although relating to the content of electronic communications, is undoubtedly a physical one rather than an abstract one....The effect here, viewed as a whole, is an improved monitoring of the content of electronic communications. The monitoring is said to be technically superior to that produced by the prior art. That seems to me to have the necessary characteristics of a technical contribution outside the computer itself.”*

- 42 I should caution that this is not to say that every such invention will necessarily involve a technical contribution. Even though the examiner has reached a different conclusion in this case, I think at some level he has also appreciated the distinction between meteorology, climatology, seismology and cosmology on the one hand and finance, economy and population dynamics on the other. His view is that tracking trends in rainfall or temperature data, for instance, could conceivably be technical but only if it involves a new means of gathering the data, such as a new sensor or a new arrangement of existing sensors. There can surely be no doubt that new sensors or sensor arrangements are outside of the exclusions of section 1(2) but Mr Tzara does not need to go so far as to amend his claims to include details of a sensor to provide a technical contribution (and nor can he, as he has not invented a sensor). If he limits his claims to the field of meteorology, climatology, seismology or cosmology then in my view the contribution will be technical, as it will then relate to triggering an alert in response to determining a reversal of a trend in observations or measurements that pertain to the physical world. Such a contribution does not fall solely within the excluded fields. Whether the invention avoids the separate requirements for novelty and inventive step is another matter.
- 43 I have not addressed the mathematical method exclusion, but in the light of what I have already decided I do not see the need to do so. That said, while the contribution clearly involves some mathematics it seems to me that a device or a computer program which triggers an alert must necessarily include something beyond a mathematical method as such.
- 44 I have considered the dependent claims. They contain further details of how an alert may be deactivated, how the thresholds may be user selected, and the nature of the alert. I can see nothing in these claims which takes the contribution outside the business method and/or computer program exclusions.

### **Conclusion**

- 45 As I have set out above, the claims, as they stand, clearly encompass activities which fall within the excluded fields, in particular the field of business methods. For that reason, the application cannot currently be granted. However, the claims also cover a device and a method which may be of use in technical fields – meteorology, climatology, seismology, cosmology. It is therefore possible for Mr Tzara to restrict his claims so as to eliminate activities within the excluded fields from the scope of protection.
- 46 If Mr Tzara wishes to pursue this application, he should file amended claims which overcome the issues outlined above within one month of the date of this decision. If he does not the application will be refused.
- 47 Upon receipt of amended claims the application will be referred to the examiner to conclude the examination process. The examiner has deferred consideration of all issues except for the sole issue addressed above. Mr Tzara should be aware of the

possibility that on completing the prior art search the examiner may find that the invention lacks novelty or inventive step.

### **Appeal**

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

**Huw Jones**

Deputy Director, acting for the Comptroller