Intellectual Property Office

BL O/381/17

11 August 2017

PATENTS ACT 1977

APPLICANT	Agilent Technologies Inc.
ISSUES	Whether patent application number GB1018608.8 complies with Section 1(2)(a), (c) and (d) and whether amendments filed contain added matter under Section 76(2)
HEARING OFFICER	Dr L Cullen

DECISION

1 This decision concerns patent application GB1018608.8 entitled "*Peak correlation and clustering in fluidic sample separation*" in the name of Agilent Technologies Inc. and primarily whether the invention set out in this application relates to matter excluded under Section 1(2)(a), (c) and (d) of the Patents Act 1977 (hereafter the Act). There is also a question in relation to whether the latest set of amended claims include added matter under Section 76(2) of the Act.

Background

2 The application was filed on 4th November 2010 with no priority claim. It was published on 9th May 2012 as GB2485187. The compliance date has been extended to 7th August 2017 as-of-right under rule 108(2) of the Patents Rules 2007, as amended, (hereafter the Rules).

3 The examiner dealing with the application has maintained throughout his consideration of this application that the claimed invention is excluded as a program for a computer [section 1(2)(a) of the Act], a mathematical method [section 1(2)(c) of the Act] and/or the presentation of information [section 1(2)(d) of the Act]. The applicant has not been able to overcome these objections, despite several rounds of correspondence and amendments to the application. With the position unresolved, the applicant requested a hearing.

4 The Examiner has deferred consideration of the novelty, inventive step, clarity and support for the claimed invention until the issues related to patentability have been resolved.

5 In his report to the applicant, dated 20 April 2017, setting out the matters to be dealt with at the hearing, in addition to the patentability objection, the examiner also indicated that the latest set of claims on file, dated 20th March 2017, may include added matter.

6 In an official letter to the applicant, dated 31st May 2017, on behalf of the Hearing Officer, it was confirmed that the issue of added matter in relation to this latest set of amended claims dated 20th March 2017 would be considered at hearing. The applicant provided a skeleton argument, dated 2nd June 2017, setting out their position in relation to the patentability objection. I would like to thank the applicant for proving their skeleton argument in good time before the hearing.

7 The matter came before me at a telephone hearing on 9th June 2017. The applicant was represented by Andrea Pavan, a Patent Attorney of Dilg, Haeusler, Schindelmann Patentanwaltsgesellschaft mbH with an address in Munich, Germany, and additional arguments were heard from Daniel Barth, the Head of the European Patent Department of the applicant, Agilent Technologies Inc. (hereafter Agilent), also with an address in Germany. Emma Porter acted as Hearing Assistant and the examiner, Matthew Khong, was also present.

The Patent Application

8 The application relates to a method and device for analysing all the measurement data obtained from a plurality of measurements carried out on a fluidic sample which has been separated in a separation system. This measurement data comprises experimental data obtained from the analysis of a sample comprising multiple components which have been separated from each other. The measurement may be carried out using liquid or gas chromatography and the corresponding chromatogram from each measurement comprises a data set.

9 A signal feature relates to a specific part of a measurement data set which is of interest. If the measurement data set is a chromatogram, the signal feature may be a peak, a dip, a step in that chromatogram which corresponds to a particular event in the measurement data. When comparing a plurality of measurements, signal features can be clustered together from different measurement data sets to create feature clusters which relate to the same component. The criteria for identifying what signal features will be clustered together to form a feature cluster are set by the user, e.g., a feature is part of a signal cluster if it falls within a threshold value, for example, if the two signal features in different measurement data sets are within a certain retention time window. The spread of each feature cluster corresponds to the size of the cluster and is calculated to indicate the reliability of that individual cluster.

10 The signals in each data set, e.g. the peaks of each chromatogram obtained, may be matched with pre-known technical information, e.g. relating to the expected components in the fluidic sample. Signal features that are expected, e.g., expected peaks in the chromatogram corresponding to retention times of known components, can be identified. If there are signal features that are not identified, e.g. additional features are present in the measurement data or some signal features are absent, this can be subject to clustering to determine if they relate to the same component(s) or

not. The presence of unidentified signal features and/or clusters would, for example, indicate the presence of impurities in some or all of the fluidic samples tested.

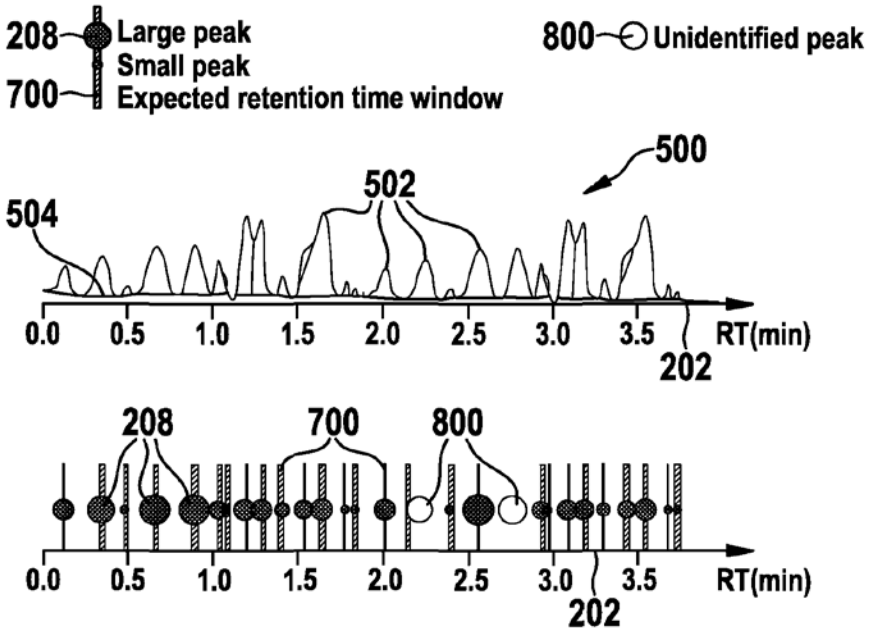

Fig. 8

11 The feature clusters and the spread of the feature clusters are displayed, with many examples of such display methods being included in the application as filed. Expected signals may be clustered and displayed. Unidentified signals may be clustered and displayed. An example of how to display a cluster of expected signal features and of unidentified signal features is shown in figure 8, reproduced above. The expected signal features (in this case from a single chromatogram data set) are displayed as dark circles 208 and the unexpected peaks are displayed as white circles 800. The size of the circle corresponds to the strength of the signal feature and the bar with each circle correspond to the spread for that signal feature

12 One embodiment of the invention (as described in paragraphs [0063]-[0069]) describes clustering only the features which could not be identified by comparison with pre-known technical information (i.e. only clustering the unidentified peaks). The application as filed discloses some example algorithms for the simple clustering and the spread determination which may be used for the expected and unidentified data points, but the specific mathematical methods of clustering and spread determination disclosed are not an essential component of the invention.

13 Another embodiment (as depicted in Figure 9 below) results in the display of the clustering of expected (208) and unidentified peaks (800) and also indicates when expected peaks are not found (900). In some events an alert may be triggered by the presence of an unidentified peak and/or the absence of an expected peak.

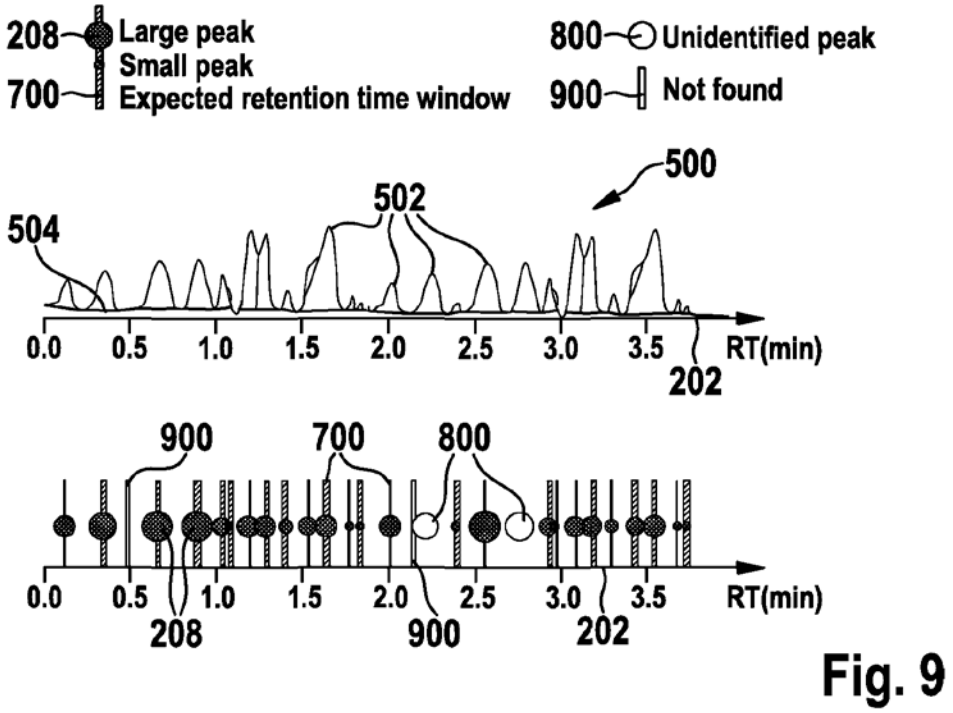

Fig. 9

14 The most recent set of claims are those filed on 20th March 2017. There are two independent claims – the device of claim 1 and the method of claim 23. Claim 1 reads as follows:

> *A measurement data analysing device (100) the measurement data having a plurality of data sets (206), each data set (206) being assigned to a respective one of a plurality of measurements on a fluidic sample to be separated in a separation system, each data set (206) having multiple features (208) being indicative of different fractions of a fluidic sample to be separated in the separation system, the device (100) comprising:*
>
> *a cluster determining unit (108) configured for determining feature clusters (350) by clustering features (208) from different data sets (206) presumably relating to the same fraction, wherein features for which one or more rules for clustering have failed are determined as suspicious features;*
>
> *a spread determining unit (110) configured for determining for at least a part of the feature clusters (350) a spread (352) of the features (208) within a respective feature cluster (350);*
>
> *a display unit (112) configured for displaying at least the part of the feature clusters (350) together with a graphical indication of the corresponding spread (352) and of the determined suspicious features.*

Claim 23 reads as follows:

> *A method of analysing separation measurement data having a plurality of data sets (206), each data set (206) being assigned to a respective one of a plurality of measurements on a fluidic sample to be separated in a separation system, each data set (206) having multiple features (208) being indicative of different fractions of a fluidic sample to be separated in the separation system, the method comprising:*
>
> *determining feature clusters (350) by clustering features (208) from different data sets (206) presumably relating to the same fraction, wherein features for which one or more rules for clustering have failed are determined as suspicious features;*
>
> *determining for at least part of the feature clusters (350) a spread (352) of the features (208) within a respective feature cluster (350);*
>
> *displaying at least the part of the feature cluster (350) together with a graphical indication of the corresponding spread (352) and of the determined suspicious features.*

15 The Examiner considered that the underlined phrase "*wherein features for which one or more rules for clustering have failed are determined as suspicious features*" constituted added matter.

Issues to be decided

16 There are two issues to be decided in relation to this application.

17 I shall first consider if the latest set of amended claims on file does include matter not disclosed in the application as originally filed.

18 I will then go on to consider if the application relates to subject matter that falls within the exclusions listed in Section 1(2) of the Act and is thus deemed not to be an invention for the purposes of the Act. In particular, does this application relate to a mathematical method, presentation of information or a computer program?

The Relevant Law

Added Matter

19 Section 76(2) of the Act makes clear that any amendment to an application for a patent must not result in a disclosure that goes beyond that in the application as filed, i.e. it should not add matter to a patent application. This section of the Act reads as follows:

> "*No amendment of an application for a patent shall be allowed under section 15A(6), 18(3) or 19(1) if it results in the application disclosing matter extending beyond that disclosed in the application as filed."*

In this instance we are concerned with amendment of the application for a patent made under Section 18(3) of the Act.

20 The case law setting out the correct approach to use in assessing added matter is *Bonzel and Schneider (Europe) AG v Intervention Ltd* [1991] RPC 553 ("*Bonzel*"), where Aldous J (as he then was) stated:

> *"The decision as to whether there was an extension of disclosure must be made on a comparison of the two documents read through the eyes of a skilled addressee. The task of the Court is threefold:*
>
> *(a) To ascertain through the eyes of the skilled addressee what is disclosed, both explicitly and implicitly in the application.*
>
> *(b) To do the same in respect of the patent as granted [or, in this case, the application as amended].*
>
> *(c) To compare the two disclosures and decide whether any subject matter relevant to the invention has been added whether by deletion or addition. The comparison is strict in the sense that subject matter will be added unless such matter is clearly and unambiguously disclosed in the application either explicitly or implicitly."*

21 Also useful is a passage from *Richardson-Vicks Inc.'s Patent* [1995] RPC 568 ("*Richardson*") where Jacob J (as he then was) referring to the test in *Bonzel*, stated:

> *"I think the test of added matter is whether a skilled man would, upon looking at the amended specification, learn anything about the invention which he could not learn from the unamended specification."*

Excluded Subject Matter

22 Section 1(2) of the Act sets out certain categories of invention that are not patentable as follows (my emphasis added in bold):

> *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) …..;*
> *(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****.*

The categories of subject-matter (a)-(d) are conventionally referred to as excluded subject matter or excluded matter.

23 The assessment of patentability under section 1(2) of the Act is governed by the judgment of the Court of Appeal in *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371 (hereafter *Aerotel*). In this judgment, the court reviewed the case law on the interpretation of section 1(2) and approved a four-step test for deciding whether an invention is patentable. The test comprises four steps:

(1) Properly construe the claim;
(2) Identify the actual contribution;
(3) Ask whether it falls solely within the excluded matter;
(4) Check whether the contribution is actually technical in nature.

24 Operation of this test is explained in paragraphs 40-48 of the *Aerotel* judgment. Paragraph 43 confirms that identification of the contribution is essentially a matter of determining what it is that the inventor has really added to human knowledge and involves looking at the substance of the invention claimed, rather than the form of the claim. Paragraph 46 explains that the fourth step of checking whether the contribution is technical may not be necessary because the third step – asking whether the contribution is solely of excluded matter - should have covered that point already.

25 Subsequently, the Court of Appeal in *Symbian Ltd's Application* [2008] EWCA Civ 1066 (reported as *Symbian [2009] RPC 1*) (hereafter *Symbian*) 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.

26 Lewison J (as he then was) in *AT&T/CVON Innovations* [2009] EWHC 343 (hereafter *AT&T*) set out five factors or signposts that he considered to be helpful when considering whether a computer program makes a technical contribution. These signposts were modified slightly in *HTC Europe Co Ltd v Apple Inc* [2012] EWHC 1789 (hereafter *HTC*). The five 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 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.*

Argument and analysis

27 When determining if an invention falls under one of the exclusions, it is critical that the substance of the invention is considered rather than the form of claim provided, by looking beyond the strict literal wording of the claims. It is not the nature of a single embodiment of an invention which is important when determining whether it is excluded, but the nature of the central idea or invention which is embodied in the claims.

28 The applicant's skeleton arguments referred to paragraph 2.3 of the European Patent Office (EPO) Technical Board of Appeal decision, T-1543/06 (game machine/GAMEACCOUNT Ltd.). However, this paragraph relates to the assessment of inventive step under the European Patent Convention (EPC). The previous paragraph 2.2 deals with the issue of patentability under the EPC and includes the phrase quoted by the applicant "*While the invention as a whole may possess technical character, it may nevertheless legitimately include both technical and non-technical features*". This is a statement I agree with. The contribution of the invention as a whole must be identified.

29 To be able to determine the central idea which is embodied in the claims, it is first necessary to determine if there is added matter present in the amended claims filed on 20th March 2017.

Added Subject Matter

30 The examiner identified the phrase "*wherein features for which one or more rules for clustering have failed are determined as suspicious features*" as added subject matter. In discussing the technical contribution of the invention and the support for the above phrase identified by the examiner, the applicant drew my attention to paragraphs [0062], [0063] and [0084] of the application as originally filed. These state:

> *"[0062] A fraction identification unit 106 of the device 100 is configured for identifying individual fractions assigned to the features in the chromatogram in different data sets by determining a match with preknown technical information. In other words, certain fractions or components of the fluidic sample which is presently analysed are expected so that the fraction identification unit 106 can identify peaks in the measurement signals and assign them to the various expected fractions. However, it may also happen that some of the determined features in the measurement spectra cannot be identified, i.e. cannot be assigned to an expected species. This can for instance be caused by impurities in the samples.*
>
> *[0063] Such impurities, which may correspond to undesired or parasitic fractions of the fluidic sample, can then be analysed by a cluster determining unit 108. The cluster determining unit 108 is configured for determining feature clusters by clustering only the features which could not be assigned to individual fractions by the fraction identification unit 106. For this purpose, the clustering determining unit 108 determines feature clusters by clustering features from different data sets which presumably relate to the same fraction. Examples for a corresponding clustering algorithm, i.e. an algorithm for determining which of the unidentified peaks or features relate to the same fraction or are at least considered to relate to the same fraction will be discussed below in more detail.*

.....

[0084] In the graphical user interface 1400 shown in Fig. 14, two peaks 1402 are marked as suspicious, because certain rules have failed (relating to warning and alert status)."

He also directed me to consider Figure 14 of the application as filed.

31 These portions of the description appear to give a clear basis for analysing unidentified peaks in a cluster determining unit and for determining the clustered unidentified peaks to be suspicious, but I consider there to be no clear and unambiguous disclosure through the eyes of a skilled addressee (either explicit or implicit) of "*wherein features for which one or more rules for clustering have failed are determined as suspicious features*". There is no disclosure of what the rules for clustering are, what constitutes a failure of these rules, and so what is determined as a suspicious feature. I consider that these are features that the skilled addressee would not know from the application as originally filed and, following the test referred to above from *Richardson,* constitute added matter. In addition, the phrase may also be considered to be unclear, with no clear bounds on what the "*rules for clustering*" may be.

32 However, in the absence of such rules for clustering and what constitutes a failure of such rules and thus a suspicious feature, I do consider that there is support in the description in relation to the analysis of peaks which do not match pre-known technical data, i.e. are not identified, and, as such, can be considered as suspicious. In effect, they are suspicious because they fail to match what is expected by the skilled addressee.

33 As a result, I consider that there is support in the application as filed for the following feature:

- analysing unidentified peaks in a cluster determining unit and determining the clustered unidentified peaks to be suspicious.

An opportunity to amend the claim to include the supported feature will be given if I find that the invention does not relate to excluded subject matter.

34 In carrying out the analysis for excluded matter below, I will proceed on the basis that the invention includes the above mentioned feature.

Excluded Subject Matter

35 To determine the nature of the central idea or invention, the invention claimed should be assessed and construed as a whole to see whether it comprises an advance that lies in a non-excluded field.

36 A number of older decisions of the EPO Boards of Appeal – such as T-0208/84 (computer-related invention/ VICOM Systems Inc.) (hereafter *Vicom*) – were used to inform the *Aerotel* test, as well as other later guidance such as the *AT&T* signposts. It has been stated, in paragraph 11 of *Symbian*, that "*as a matter of broad principle, it seems to us that the approaches in [...] the great majority of cases in this jurisdiction and in the EPO, are, on a fair analysis, capable of reconciliation*". In *HTC*, Kitchen LJ, at paragraph 41, stated that *"...in terms of result [...] it seems to me that whichever*

route is followed, one ought to end up at the same destination". The result of EPO Boards of Appeal decisions on cases with similar facts may therefore be persuasive, even though the approach taken by the EPO should not itself be followed.

37 The skeleton arguments provided by the applicant in relation to EPO Board of Appeal decision *Vicom* have been considered. In paragraphs 5-7 of *Vicom*, it is stated that "*A basic difference between a mathematical method and a technical process can be seen, however, in the fact that a mathematical method or mathematical algorithm is carried out on numbers and provides a result in numerical form, then the mathematical method is an abstract concept prescribing how to operate on the numbers. In contrast, if a mathematical method is used in a technical process, that process is carried out on a physical entity (which may be a material object or an image stored as an electric signal) by some technical means implementing the method and provides as its result a certain change in that entity. The technical means might include a computer comprising suitable hardware or an appropriately programmed general purpose computer*". I consider that the changes to the measurement data carried out by method and device of the present application, are not changes to a physical entity, as was the case in *Vicom*, where the method related to the manner in which the pixels that made up the image were processed. By contrast, in the present case, although the result of the measurement method is also an image (i.e., a signal), it is the information content of the signal which is of interest; i.e., what the image shows, not how the image is constructed. This is, I consider, an important difference. The present application does not appear to have a physical connection comparable to that in the *Vicom* case, and so it remains a mathematical method in my view. The input data is numerical, related to the information content of the signal and the output result is also numerical, related to the information content, albeit that the output numerical data is being graphically displayed in a clearer manner.

38 I note that the examiner has already referred the applicant to this view in his official examination report dated 24th November 2016 wherein the he referred to the discussion in relation to *Vicom* in Office decision, BL O/201/03 ***(****Institut Francais du Petrole & ELF EP)*[1].

39 In carrying out the analysis for excluded matter, I am bound to follow the Court of Appeal judgement in *Aerotel* and will now apply the four step test approved therein.

Step (1): Properly construe the claim;

40 The independent claims would seem to relate to analysing separation measurement data having a plurality of data sets from a plurality of measurements on a fluidic sample to be separated in a separation system and a device suitable for carrying out the method; the method comprising the following steps:

- determining feature clusters by clustering multiple features from different data sets, analysing unidentified peaks in a cluster determining unit and determining the clustered unidentified peaks to be suspicious features;

[1] See here for full text of this decision (from IPO Past Decisions database here)

- determining for at least part of the feature clusters a spread of the features within a respective feature cluster;

- displaying at least the part of the feature cluster together with a graphical indication of the corresponding spread and of the determined suspicious features.

Step (2) – Identify the actual contribution

41 In paragraph 43 of *Aerotel*, it is made clear that identifying the contribution is probably best summed up as determining what the inventor has really added to human knowledge, and this involves looking at the substance and not the form of the claims (as construed in step one). However, the court in *Aerotel* acknowledged that, for a patent application (as opposed to a granted patent), it may only be possible to identify the alleged, and not the actual, contribution.

42 The examiner considered the contribution to be the combination of the determination of the clusters, spread of those clusters and subsequent identification of suspicious or anomalous features, which are each displayed.

43 The contribution presented in the applicant's skeleton arguments was a measurement data analysis device including a cluster determining unit configured for determining feature clusters by clustering features from different data sets presumable relating to the same fraction, wherein features for which one or more rules for clustering have failed are determined as suspicious features and a spread determining unit configured for determining for at least part of the feature clusters a spread of the features within a respective feature cluster. (The underlined phrase containing added matter, as discussed earlier).

44 In *Aerotel,* the court indicated that when identifying the contribution one exercises 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*".

45 The description helpfully sets out the object of the invention in paragraph [0008]: "*it is an object of the invention to provide a convenient data analysis system simplifying a technically reasonable evaluation of measurement data for a user*." And later (at paragraph [0025]) "*a technical assistance system is provided for a technician such an as engineer, a chemist or a biologist which takes a technically well founded approach for grouping different signal features into corresponding clusters …... a visual indication is given to the user indicative of the reliability of the clustering performed by the system. Therefore the technically skilled user is assisted to properly evaluate multiple features in multiple measurements*".

46 In order to determine the actual contribution made by the claimed invention, it is necessary to take account of the state of the art (see para. 43, *Aerotel* and para. 8, *AT&T*). The prior art discussed in the section of the application entitled 'Background Art' states that computer processing of liquid chromatography data and display in two dimensions is known from DE 10 2007 000 627 A1 (see paragraph [0004]), that it is known to compare chromatograms using correlation optimised warping to remove

minor changes and drift in "*Aligning of single and multiple wavelength chromatographic profiles for chemometric data analysis using correlation optimised warping*", Journal of Chromatography A, 805, (1998) 17-35 (see paragraph [0005]) and that it is known to probabilistically associate, cluster or group results data from the mass spectrometry of a first sample and from a second sample (see paragraph [0006]). The citations found in the search carried out on the original claims of this patent application have not been discussed in any examination report, and so I will not make any reference to them here.

47 The discussion at the hearing concerning the latest amended claims, the disclosure of the application, the advantages of the system and the prior art indicated that the liquid chromatography technique was conventional and that it was also well known to compare multiple chromatograms. The applicant stated that the comparison of plural chromatograms is well known and could be done manually, albeit slowly, with a paper and pencil. Comparing and clustering data from plural measurement data sets is also well known, and the specific mathematical methods disclosed for clustering in the application are considered to be straightforward and not inventive. The variables of the mathematical clustering methods being stated by the applicant to be a matter for the attendant technician to alter with regard to the tolerances of the specific compound being produced. The claims are not, however, directed to these aspects alone.

48 The applicant was keen to emphasise that the invention is applied in a quality control process in the manufacture of pharmaceuticals and it is not just a theoretical method of representing available information. The data on the suspicious features output by the invention allows the efficient identification of alien components and it is this data extraction and the clear display of the extracted data to the user which is key to the invention.

49 Having carefully considered the arguments, application, the examiner's views and applicant's views, I find that the contribution of claims 1 and 23 is:

- Analysing measurement data of a plurality of measurements on a fluidic sample to be separated in a separation system;
- determining identified and unidentified feature clusters from a plurality of measurements, each measurement having multiple features; and
- displaying the identified and unidentified feature clusters with a graphical indication of the corresponding spread of the feature clusters.

Step (3) - ask whether it falls solely within the excluded matter;
Step (4) - check whether the actual or alleged contribution is actually technical in nature.

50 What I must now decide is whether the contribution identified above relates solely to a program for a computer, a mathematical method and/or the presentation of information. This corresponds to the third step of the *Aerotel* test.

51 The fourth step of the test is then to check whether the contribution is technical in nature. In paragraph 46 of *Aerotel*, it is stated that applying this 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". Similarly, a contribution which consists of more than excluded matter will be a "technical contribution" and so will be "technical in nature".

52 I accept the applicant's arguments that the invention relates to the extraction of data from input data, and therefore it does not relate solely to the presentation of known information. The new data is first extracted and then displayed. I do not consider that the invention relates to presentation of information as such and so it is not excluded under Section 1(2)(d).

53 It is clear that the contribution I have identified above is implemented as a computer program on conventional hardware. It is well established case law that a program which provides a technical contribution is not excluded as it is not a program for a computer as such (my emphasis added). *AT&T,* as modified by *HTC,* sets out five signposts considered to be helpful when considering whether a computer program makes a technical contribution. The applicant and the examiner agreed that signposts (ii), (iii) and (iv) were not relevant to this application. I agree. Signposts (i) and (v) are considered below.

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

54 The applicant argued that clearly displaying the unidentified peaks to the user allowed the user, probably a chemist, to check whether all components have been identified and whether additional compounds have been detected (as disclosed in paragraph [0130]) and subsequent action by the chemist would have a technical effect on the manufacturing process carried on outside the computer. However, the contribution as identified does not include any subsequent action in the manufacturing process. The contribution stops at the display of the identified and unidentified peaks and their spread.

55 Further, the application as a whole does not disclose any subsequent action – paragraph [0033] states that *"a corresponding action may be triggered when this criteria is met. The action may be an alarm alarming a user that clustering is probably not reliable. The action may however also be that the clustering algorithm will not be applied for clustering and no or another clustering algorithm has to be applied, for instance a recursive clustering algorithm*". Optionally sounding an alarm or changing from one to another unspecified algorithm are not considered to be technical effects on a process which is carried on outside the computer. Thus, I consider that signpost (i) does not help the applicant.

AT&T signpost (v): Whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.

56 When the problem overcome is a technical one, the alleged invention can be considered to have a technical nature leading to it falling outside the exclusion if (but not only if) it solves the problem. As discussed above, when assessing the contribution, the perceived problem described at paragraph [0025] of the application relates to the clear identification and display of the clustered peaks using *"a technically*

well founded approach for a grouping of different signal features into corresponding clusters" where *"a visual indication is given to the user indicative of the reliability of the clustering performed by the system*". This problem is overcome by the invention, which results in the clear display of the technical information. The technical information displayed is obtained through conventional data processing techniques, using known mathematical methods for clustering which are carried out on conventional hardware. Thus the problem and the solution reside wholly within the realm of computational and mathematical techniques. The solution of the problem identified does not make the contribution technical. Thus, I consider that AT&T signpost (v) does not help the applicant.

57 As a consequence, I am satisfied that the contribution made by the invention is not technical and resides wholly within the field of excluded matter. It is both a mathematical method and a program for a computer and, as a result, it fails both final steps of the *Aerotel* test.

Conclusions

58 Taking into account all of the above, I consider that the invention claimed in patent application GB1018608.8 is excluded from patentability under section 1(2)(a) of the Act because it consists of a mathematical method, and under section 1(2)(c) of the Act because it is a program for a computer.

59 Having considered the application as filed, I am unable to identify any material in the specification that could reasonably be expected to form the basis of a patentable claim. As a consequence, I refuse the application under section 18(3) for failure to comply with sections 1(2)(a) and 1(2)(c) of the Act.

Appeal

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

Dr L CULLEN

Deputy Director, acting for the Comptroller