

OPINION UNDER SECTION 74A

Patent	GB 2363843
Proprietor(s)	Oxford Ancestors Limited
Exclusive Licensee	
Requester	DNA Heritage, on 10 January 2008
Observer(s)	
Date Opinion issued	8 April 2008

The request

1 The comptroller has been requested to issue an opinion as to whether claims 4-7 of GB 2363843 B (“the patent”) are novel and inventive over the following documents:

- D1 “Y Chromosome Project Synopsis”. Savin (www.savin.org/dna)
- D2 “Jefferson fathered slave’s last child”; *Nature*, vol 396, pp 27-28 (1998). Foster *et al.*
- D3 “Y chromosomes of Jewish priests”; *Nature*, vol 385, pp 32 (1997). Skorecki *et al.*
- D4 “Fathers and sons: the Y chromosome and human evolution”; *Trends in Genetics*, vol 11, pp 449-456 (1995). Jobling & Tyler-Smith.

2 In particular DNA heritage (“the requester”) seeks an opinion as to whether claims 5 and 7 are novel in light of documents D1-D4, whether claim 4 is novel in light of documents D2-D4, and whether claim 6 is novel in light of document D4. The requester also seeks an opinion as to whether claims 4-7 are inventive over these documents.

3 The requester also cited a further document as background information:

- D5 “In the name of the father: surnames and genetics”; *Trends in Genetics*, vol 17, pp 353-357 (2001). Jobling.

- 4 This document was published after the priority date of the patent and therefore cannot be used in the 2(2) or 2(3) field. However, the requester cites this document to provide a historical perspective into the study of surnames and genetics.

Observations

- 5 Observations in response to the request were received from the patent holder Oxford Ancestors Limited (“the proprietor”). These maintain that the invention is new and involves an inventive step. The proprietor also challenged the status of D1 as a prior art document as it was downloaded from the internet on 15 May 2007.
- 6 The proprietor provided a copy of a paper and a section of a book in support of the argument on the novelty and inventiveness of the patent (documents D6 and D7 respectively):

D6 “The Y chromosome in forensic analysis and paternity testing”;
Int J Legal Med, vol 110, pp 118-124 (1997). Jobling *et al*.

D7 “*DNA and Family History*”, PRO Publications (2004). Author
Chris Pomery

- 7 D6 was considered during the course of the examination, and D7 was published several years after the priority date of the patent.

Observations in reply

- 8 Observations in reply were received from the requester on countering those challenges and maintaining both the novelty and inventive step questions.
- 9 The requester also argued that D1 was available at the priority date of the patent as the author of D1 had dated the copyright as March 1998, and provided two further documents to support the argument that D1 was available at the priority date of the patent:

D8 <http://freepages.genealogy.rootsweb.com/%7Egkbopp/DNA/DNAtimeline.htm>

D9 <http://www.oxfordancestors.com/articlesView.html?id=23>

- 10 Both of these web pages refer to the Savin DNA project, which was started in May 1997. On the balance of probabilities it is reasonable to assume that D1 was available to the public at the date indicated by the copyright. However, if it is shown at a later date that D1 was in fact not available to the public at the

priority date of the patent, then the references to that document in this Opinion should be ignored.

The patent

- 11 International patent application number PCT/GB00/00193 was filed on 25 January 2000, claiming priority from GB 9901596, which itself was filed on 25 January 1999. The patent was granted on 27 April 2004, with the title "Method of using Y chromosome haplotyping in forensic and genealogic tests". It is currently in force.
- 12 The patent is based upon the Y chromosome haplotype analysis of males, and the uses of this is surname analysis and/ or genealogical analysis. It consists of 7 claims, although claim 1 and dependent claims 2 and 3 are not subject to this opinion.

The claims

- 13 Claims 4-7 are independent claims, and read as follows:
4. *A method of populating a database, comprising:
-haplotyping the Y chromosome of a male with a surname at one or more loci on the chromosome to determine feature data of the haplotype linked to the surname, and entering feature data into a database;
-repeating the above haplotyping for a plurality of males with the same surname, and for a plurality of males with different surnames, to populate the database to contain information about the relationship between different surnames and haplotype features.*
 5. *A database, comprising feature data representing haplotype features derived from Y chromosomes of males, the haplotype features being linked to the surnames of the males.*
 6. *A method of surname analysis, comprising:
-determining feature data of one or more haplotypes from Y chromosomes derived from two or more males whose surnames are related phonetically, or in their spelling;
-processing the feature data for the haplotypes to determine the likelihood of a common genetic origin for the males, by comparing the feature data of the males; and
-outputting the likelihood of a common genetic origin in dependence upon the result of the comparison.*
 7. *A method of genealogical analysis, comprising:*

-determining feature data of one or more haplotypes from Y chromosomes derived from two or more males with the same surname;
-processing the feature data for the haplotypes to establish putative common ancestry for the males, by comparing the feature data of the males; and
-outputting the likelihood of a common ancestry in dependence upon the result of the comparison.

- 14 The requester has suggested that these claims can be grouped into two groups, with claims 4 and 5 forming one group relating to the population of a database, and a second group with claims 6 and 7 relating to a method of genealogical analysis. I agree that grouping these claims will be more efficient when assessing their novelty and inventive step in light of documents D1-D4. I will also follow the order suggested by the requester and analyse claims 6 and 7 first, followed by claims 4 and 5, as my opinion of claims 6 and 7 will have a bearing on my opinion of claims 4 and 5.
- 15 In my assessment of the novelty and inventive step of the claims I will make a purposive construction of the claims, following the judgement of Lord Hoffman in *Kirin Amgen*¹. I will therefore interpret the claims in the way that I consider a person skilled in the art would have understood the patentee to mean by the language of the claim.

Novelty

Claims 6 and 7

- 16 Claim 6 relates to a method of surname analysis comprising comparing the haplotype data for two or more males with surnames that are related phonetically, and determining the likelihood of a common genetic origin for those males.
- 17 The requester has argued that claim 6 lacks novelty in light of the disclosure of D4. The requester considers that the document “directs the reader to apply the methodology taught in the paper to the genealogical question of whether two or more males with the same surname are likely (or unlikely) to be related”. He argues that it would be known to a person skilled in the art that surnames have variations or are corrupted over time for various reasons. Nevertheless, this document does not suggest the analysis of similar surnames, and therefore in my mind cannot possibly anticipate the claim.
- 18 Therefore I consider that claim 6 is novel over the disclosure of D4.

¹ *Kirin Amgen v Hoechst Marion Roussel Ltd* [2005] RPC 9

- 19 Claim 7 defines a method of genealogical analysis comprising comparing the haplotypes of the Y chromosomes of males with the same surname, and outputting the likelihood of a common ancestry based upon the result.
- 20 The requester considers that claim 7 lacks novelty in light of D1-D4. In order for a document to anticipate this claim, it will need to disclose a method of genealogical analysis, i.e. a method of assessing common ancestry based upon the haplotype analysis of males of the same surname. This disclosure may be implicit, but must necessarily infringe the patent when performed². Consequently, in assessing the novelty of claim 7, I have considered whether D1-D4 would necessarily infringe the patent. I have also considered whether these documents provide an enabling disclosure.
- 21 D4 is merely a review article, summarising the uses of Y chromosome haplotype analysis. It does suggest a use in genealogical studies, and acknowledges the patrilineal inheritance of both surnames and Y chromosome as a useful tool in such studies. The requester has referred to a specific paragraph from this document, which states that “*The availability of Y chromosome DNA polymorphisms will also allow other uses to be addressed. In many societies, surnames are co-inherited with Y chromosomes; powerful markers for discriminating between Y chromosomes could be used as genealogical tools. They would be most useful where surnames are expected to have a single or few origins but would be complicated by non-paternity*”³. Whilst this document does direct a person skilled in the art towards the method of claim 7, I am not convinced that it explicitly discloses the method of this claim. I have noted the requester’s argument that the person skilled in the art would be able to perform the disclosure using their common general knowledge. I acknowledge that D4 does disclose a number of markers that can be used in haplotyping studies, and provides an overview of the uses of these studies, of which genealogical analysis is one of them, and agree that given the common general knowledge at that time a person skilled in the art would be able to perform a genealogical analysis based upon the disclosure of this document. However, in my opinion it does not provide sufficient detail of these methods to necessarily infringe the method of claim 7. Therefore, in my opinion claim 7 is novel in light of D4.
- 22 Documents D1 and D2 both explicitly disclose the analysis of the Y chromosome of males with the same surname, and the use of these results to determine a common ancestor. Specifically, D1 discloses a study of at least 66 males with the surname Savin, and the analysis of their DNA to determine the probability of a common male ancestry. D2 investigates male descendents of Thomas Jefferson II, and provides an analysis of the Y chromosome haplotype of distant cousins in the Jefferson line. Although this document

² *SmithKline Beecham Plc’s (Paratoxetine Methanesulfonate) Patent* [2006] RPC 10

³ See D4, page 455 “*Genealogical and forensic studies*”

does not state that the males tested do in fact carry the Jefferson surname, given the patrilineal mode of inheritance of surnames, on the balance of probabilities I can assume that the males tested all shared the same surname. D3 also provides a method of genealogical analysis, but tests males based upon their profession (Cohanim priests) and not their surnames. Nevertheless, given that many of the men in the Cohanim priesthood share the surname Cohen⁴, it would be implicit that many of the males tested in this study share the same surname. The study concludes that the Y chromosome haplotype similarities demonstrate a distinct paternal genealogy for Jewish priests. Although the methods of analysis are not specifically disclosed in D1-D3, these documents discuss the particular haplotypes within the Y chromosome used in the analysis, and given the state of the art at the time of publication of these documents, I consider that a person skilled in the art would be able to work the methods. Therefore these documents do provide an enabling disclosure.

23 The next step is to determine whether these documents would infringe claim 7 of the patent if the methods within them were performed. Each of the documents D1-D3 would require the determination of the haplotypes of Y chromosomes of males with the same surname, and the subsequent analysis and reporting of the haplotype data to establish common ancestry (I note that the second and third sections of claim 7 would be construed simply as methods of analysing and reporting the results of the haplotype study respectively). It is therefore clear that D1-D3 provide methods that follow the steps of claim 7 and therefore would necessarily infringe this claim.

24 Therefore, I conclude that claim 7 is not novel in light of the disclosures of D1-D3.

Claims 4 and 5

25 Claims 4 and 5 relate to a method of populating a database with Y chromosome haplotype data associated with a surname, and a database comprising such data respectively. The documents D1-D4 each discuss the haplotyping of the Y chromosome of males with the same or different surnames, and this was discussed above in my assessment of claim 7. Consequently, in my assessment of the novelty of claims 4 and 5 in light of D1-D4, I will look at the term 'database'. The definition of 'database' in the Oxford English Dictionary is "*A structured set of data held on a computer*". However, I consider this to be too narrow a definition and consider that a person skilled in the art would not expect the database to necessarily be held in electronic form. Moreover, there is nothing in the patent that suggests that this database is in an electronic format. The requester has suggested that a skilled person would have understood a database to mean "an

⁴ See D5, page 354 last paragraph

arrangement of the feature data in an ordered and logical way”, and I agree with this broader interpretation. Therefore, in order for a document to anticipate these claims, the documents will necessarily have to disclose the an ordered arrangement of data comprising the haplotype features of the Y chromosomes of the males linked to their surnames. I appreciate that it is more than likely that the information collected from the haplotyping studies discussed in D1-D4 is entered into a database of sorts, however I have to consider the possibility that the information may not have been collated in such a manner. In *General Tire*⁵, it was considered that if the prior art publication “contains a direction which is capable of being carried out in a manner which would infringe the patentee’s claim, but would at least as likely to be carried out in a way which would not do so, the patentee’s claim will not have been anticipated...” It is with this in mind that I will assess the novelty of claims 4 and 5.

- 26 The requester argues that claim 4 lacks novelty in light of D2-D4, and that claim 5 lacks novelty in light of D1-D4
- 27 D2 or D3 do not discuss the entry of the haplotyping data into a database. I note that the requester has argued that the chart of D2 is in itself a database, and that the large numbers of males tested in D3 are indicative of the use of a database. However, whilst it is likely that this is the case, it is not explicit and therefore I do not consider that these documents clearly teach the use of a database in their methods. Consequently, I am not convinced that a mere tabulated form of results would necessarily infringe a claim to a database *per se*, or to a method of populating a database. Moreover, D3 is not specifically a method of surname analysis. Therefore I consider that claims 4 and 5 are novel over D2 and D3. D4 is a review article that discusses polymorphisms within the Y chromosome and potential uses of this, including as a genealogical tool. Box 1 of this document describes the “Y chromosome consortium” as a group involved in the study of genetic variation on the human Y chromosome. It does refer to the generation of a database containing the results of haplotyping the Y chromosome, but it does not suggest the use of this database in establishing a relationship between or even linking surnames with the Y chromosome haplotype. Whilst the document does refer to the co-inheritance of Y chromosomes with surname, it does not explicitly disclose the establishment of a database linking the two. Consequently, this document does not anticipate the claims. D1 does not specifically disclose a database, again although it is likely that a database will be used to collect the data from this study, it is not explicitly the case at the time of publication of this document.
- 28 I therefore conclude that claim 4 is novel over the disclosure of D1-D4 and that claim 5 is novel over the disclosure of D2-D4.

⁵ *General Tire & Rubber Company v Firestone Tyre & Rubber Company Limited*, [1972] RPC 457

Inventive step

- 29 The requester acknowledges that the four-step test formulated in *Windsurfing*⁶ should be adopted when assessing obviousness; I will use this test as recently reformulated in *Pozzoli*⁷. The assessment of inventive step using the *Windsurfing/ Pozzoli* approach is as follows:
- (1)(a) Identify the notional “person skilled in the art”
 - (1)(b) Identify the relevant common general knowledge of that person;
 - (2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;
 - (3) Identify what, if any, differences exist between the matter cited as forming part of the state of the art and the inventive concept of the claim or the claim as construed;
 - (4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?
- 30 I have already found that claim 7 is not novel in light of D1-D3, and therefore will not be considering the inventiveness of this claim in light of these documents. Therefore I will not make an assessment of the differences of this claim over these documents.
- 31 As the requester did not use the *Windsurfing/ Pozzoli* test for inventive step they have not provided any suggestion as to the person skilled in the art in this case. In my opinion the person skilled in the art would be a geneticist with knowledge of human genetics and genealogy. Such a person would be aware of the genealogical significance of the patrilineal transfer of the Y chromosome; the patrilineal transfer of surnames is obviously well known in society in general. It is clear that at the priority date of the patent the use of Y chromosome haplotype analysis was known in order to trace paternal lineages, with microsatellites and bi-allelic markers commonly used in this analysis. It would be well known, therefore, that the Y chromosome is passed from father to son through the generations, in the same manner as surnames.
- 32 This forms the basis of the common general knowledge in this area at the priority date of the patent.
- 33 In the observations and observations in reply there is some discussion over where the inventive concept actually lies. In the observations, the proprietor argued that there is no suggestion in the art that a link between the Y

⁶ *Windsurfing International Inc v Tabur Marine (Great Britain) Ltd* [1985] RPC 59

⁷ *Pozzoli SPA v BDMA SA* [2007] EWCA Civ 588

chromosome and surname is sufficiently reliable to allow the invention of claims 4-7 to be carried out. The proprietor also argued that at the time of the invention informed opinion “dismissed the practical application of using one to follow the other”. In particular, the proprietor referred to D6, and specifically the penultimate paragraph of column 1, page 123, which states that “*Y chromosomes are co-inherited with surnames in many societies, and in an ideal world, a sufficiently detailed Y haplotype could give police offices the surname of the person who left a sample at a crime scene. To be realistic, however, the practicalities of haplotyping and the frequency of non-paternity (itself an issue where Y typing is relevant) make this a highly fanciful scenario*”. In the opinion of the proprietor, the person skilled in the art would consider the “association of surnames and Y chromosomes to be so vulnerable to issues of non-paternity, among others, to make its practical application impossible”.

- 34 In the observations in reply, the requester argued that the paragraph from D6 was taken out of context and was therefore misleading. I am inclined to agree with the requester in this regard. The paragraph in question relates to a sample of DNA left at a crime scene, and its subsequent use in identifying an unknown male by surname based upon the haplotype analysis of the Y chromosome. It does not relate to the genealogical analysis of males with the same or similar surname. In my opinion, the argument of the proprietor that the practical application of the association of surnames with Y chromosomes would be impossible is not valid as it is clear from the prior art that it is possible to follow the patrilineal inheritance of the Y chromosome along with the patrilineal inheritance of the surname; this in itself is a practical application of this association.
- 35 The proprietor also referred to an expert from a book, D7, which made reference to the study upon which the patent is based: “*the first study to investigate the common ancestry of a group of people with the same surname reported its result in a scientific journal in the year 2000*”. In his arguments the proprietor stated that men were enrolled in this study by surname alone, independent of any pedigree or genealogical consideration.
- 36 The requester responded by pointing out that this is not relevant to the inventive concept of the claims as the claims are not limited to studies only involving males chosen independently of any pedigree or family connection. I agree with the requester in this regard, the claims relate to any two males with the same or similar surname, and would be understood to mean as much to a person skilled in the art.
- 37 The second step of the *Pozzoli* approach is to identify the inventive concept of the claims in question. I have already made a purposive construction of the claims when assessing novelty, and this construction will be used for the assessment of inventive step.

- 38 The proprietor has argued that the underlying inventive concept to claims 4-7 relate to the “surprising observation that there is a reliable link between the inheritance of Y-chromosomes and surname”. In the observations in reply, the requester argues that this is not a reflection on the construction of the claims as none of claims 4-7 actually claim this inventive concept. It is clear that the inventive concept is based upon the patrilineal inheritance of both Y chromosome and surname, but this is too general to apply to claims 4-7 as a whole. I will therefore consider the inventive concept of the claims individually.
- 39 I will continue with the grouping of the claims, as suggested by the requester, for my assessment of the inventive step, will firstly follow steps 2-4 of the *Pozzoli* approach for claims 6 and 7 and then follow these steps for claims 4 and 5.

Claims 6 and 7

- 40 According to the requester, the inventive concept of claim 6 is the application of known Y chromosome haplotyping techniques to the question of how likely it is that two or more males with related surnames have a common genetic origin. I agree with this interpretation of the claim. I also agree with the requester’s interpretation of claim 7, in which the inventive concept lies in the application of known haplotyping techniques to the question of how likely it is that two males with the same surname have a common ancestry.
- 41 The third step of the *Pozzoli* approach is to identify what, if any, differences exist between the prior art documents and the inventive concept of the claim.
- 42 D1 discusses obtaining the haplotype data from the Y chromosomes of males with the surname “Savin”; these features are clearly linked to the surnames of these males. It does not suggest the repeating of this haplotyping for males with different surnames.
- 43 D2 compiles haplotype data from male members of the Jefferson family and other families associated with the Jefferson family. The haplotype data is presented in a format linking it to the specific family tree, and inherently the specific family surname. It therefore analyses haplotype data from males with different surnames.
- 44 D3 does not mention surname analysis, but it is clear that it would be known in the art that many members of the Cohanim priesthood share the same surname (Cohen) or a variation of that name. It does provide haplotype data in relation to the profession of these males, but the entry of Jewish males into this priesthood is determined by strict patrilineal descent. This document therefore discloses the association of the Y chromosome haplotype with an additional designation passed on by patrilineal descent.

- 45 D4 is a review article summarising the uses of Y chromosome haplotype data. This document does suggest the use of Y chromosome markers are genealogical tools due to the co-inheritance of the Y chromosome with the surname. It concludes by suggesting that the work with the Y chromosome may be used to identify unambiguous paternal lineages running through the human population.
- 46 The final step of *Pozzoli* is to decide whether the differences between the invention and the prior art would have been obvious to a person skilled in the art.
- 47 In my mind, the question of obviousness of claims 6 and 7 comes down to whether it would have been obvious to use Y chromosome haplotype data in determining the common ancestry of males. I think that the patrilineal inheritance of both surnames and the Y chromosome is of importance in answering this question, and each of documents D1 D2 and D4 discuss the use of patrilineal inheritance of Y chromosomes and surnames in the tracing of family trees. Both D1 and D2 disclose the haplotyping of Y chromosomes and the association of these haplotypes with surnames (D1), or male descendants of the same family, and inherently surnames (D2). D3 is slightly different as it does not explicitly mention surnames, but entry into the priesthood and its passing in a patrilineal manner in the same way as surnames.
- 48 I will look first at the inventive step of claim 7 in light of D4. Referring back to my assessment of this document in paragraph 17, I consider that this document would direct a person skilled in the art towards the methods of claim 7, particularly the paragraph on page 455. The processing methods of the claim are not an inventive feature, they are simply methods of analysis of the information to allow the assessment of the common ancestry. Therefore I consider that claim 7 lacks inventive step in light of D4.
- 49 Turning now to claim 6, which requires the analysis of the haplotype data of two or more males with a similar surname to determine whether or not there is a common genetic origin. As pointed out by the requester, it is known that surnames have variations, and these can become corrupted over time due to factors such as migration and misspelling. Therefore, there would always be the possibility that similar surnames shared the same origin, and this would be well known to any person with a knowledge of genealogy. Would the person skilled in the art have deemed these haplotyping methods to be sufficiently reliable to consider tracing ancestry back through many, many generations, to before the surnames became corrupted. In other words, would it therefore be obvious to test for a common origin by looking at Y chromosome haplotypes?

- 50 I will consider D3 first. This document did in fact test males with similar surnames, which were derived from Cohen such as Kahn and Kane⁸, although this wasn't explicitly disclosed in the document. In my opinion, it is the analysis of the Y chromosome haplotypes of the Sephardic and Ashkenazic Jews that is more significant. Both communities displayed a haplotype distinction between priests and lay members of each population, and, moreover, this document concluded that a particular haplotype of the Y chromosome was "*the founding modal haplotype of the Jewish priesthood*". A skilled person reading this would realise that Y chromosome haplotyping was a tool that could be used in displaying common ancestry dating back hundreds of years, and combined with the knowledge that surnames vary, would appreciate that this haplotyping could be used to investigate common ancestry between males with a similar surname. In fact, in my mind, this document clearly suggests that Y chromosome haplotyping would be a valuable tool in such genealogical studies. Therefore I have no doubt in coming to the conclusion that D3 renders obvious claim 6.
- 51 D2 demonstrates the results of the haplotyping of the Y chromosome of male ancestors of several families. The males tested from each family line were distant cousins in most cases, demonstrating that common male ancestry could be traced back at least as far as 6-8 generations. Most significantly is the descendent of a slave of the Jefferson family, who displayed the same Y chromosome haplotype as direct male descendents of the Jefferson family. A skilled person would understand from this that regardless of legitimacy and surname, patrilineal inheritance of the Y chromosome could reliably be used in genealogical studies to determine a male's ancestry. Therefore, if they wanted to demonstrate a common origin for a similar surname then they would appreciate from this document that Y chromosome haplotype data could be used. I therefore consider that claim 6 is obvious in light of D2.
- 52 D4 goes beyond simple family tree association of the Y chromosome. This document proposes a use in evolutionary studies, suggesting that these methods could be used to trace ancestors through the male lineage through thousands of prior generations. Again, this document suggests to a person skilled in the art wanting to prove the origins of a surname that the Y chromosome haplotype data could be used. Therefore, in my opinion claim 6 lacks inventive step in light of D4.
- 53 D1 discloses an analysis of males with the surname Savin. It states that the lineage of each name is traced back until the ancestor is no longer a Savin, or until records are no longer available. The results are used to indicate the probability of common male ancestry. There is no indication in D1 of the success of this project, and it is this lack of disclosure that may not necessarily encourage a person skilled in the art to look for a haplotype association of males with different surnames. It does disclose the analysis as

⁸ See D5 page 354

an aid to genealogical research, but I do not think that it teaches that such haplotyping techniques could usefully be applied to the analysis of the origins of similar surnames. Therefore I do not consider that claim 6 is obvious in light of D1.

54 I therefore conclude that claim 6 lacks inventive step in view of the disclosure of D2-D4, and that claim 7 lacks inventive step in view of the disclosure of D4.

Claims 4 and 5

55 For the second step of the *Windsurfing/Pozzoli* approach, the requester considered that the inventive concept of claim 4 would be the step of haplotyping the Y chromosome of a male, repeating this process for a number of males with a variety of surnames, and then organising the haplotype data obtained into a structured arrangement to permit comparison between the haplotype data set. Claim 5 is simply interpreted as any ordered arrangement of haplotype data obtained from males with the same or similar surnames. I agree with this assessment of the inventive concept of these claims, but in light of the dictionary definition of database, I consider that the arrangement would be held in electronic form only, and not electronic and non-electronic form as suggested by the requester. I have already discussed the inventiveness of the use of Y chromosome haplotyping in genealogical studies related to the surnames of males above, and so will not consider this aspect. I will look at whether it is inventive to create a database linking this information, in light of D1-D4.

56 As discussed in paragraphs 26-28 above, D1-D3 do not explicitly disclose a database. D4 discloses the generation of a database comprising information relating to polymorphic loci on the Y chromosome. This appears to be a mere collation of all polymorphisms on this chromosome, and does not associate these with surnames

57 This brings me to the fourth step of the *Pozzoli* approach. As far as I can see, the question of obviousness of claims 4 and 5 comes down to would it have been obvious to maintain a database comprising haplotype information from the Y chromosomes of males and linking this information to their surnames? Would it then be obvious to add haplotype information for males with different surnames?

58 The use of a database in itself is not inventive; this is a common means of collating and displaying data. But is there sufficient knowledge in the prior art to direct a skilled person to compile information linking the surnames and Y chromosome haplotypes? In my opinion there is sufficient knowledge. Each of D1-D4 disclose the linking of surnames to the Y chromosome haplotype of males, either directly as in D1, D2 & D4, or indirectly as in D3. I therefore have no difficulty in coming to the decision that it would be obvious to compile

this information into a database. Therefore claim 5 lacks inventive step in light of D1-D4.

- 59 Claim 4 requires the additional step of testing males with different surnames and entering this haplotype data into a database in order to contain information about the different surnames and haplotype features. D2 and D3 do analyse data from males with different surnames, and look at the differences in haplotype features. These documents alone would demonstrate to a skilled person that such a database could be maintained with useful information gained from it. Therefore claim 4 is obvious in light of these documents. D4 goes a step further and suggests evolutionary studies, tracing the ancestry of all males based upon the haplotype features of their Y chromosome. A person skilled in the art reading this document would appreciate the genealogical information that could be gained from the haplotyping of the Y chromosome of males with different surnames, and therefore I consider that this document also renders obvious claim 4.
- 60 Again, D1 is a bit more limited in its scope as it only suggests the haplotyping of males with a single surname, and does not provide any results of this study. Although the genealogical significance of the patrilineal inheritance of both surnames and Y chromosome was known in the art, reading this document in isolation I am not convinced that skilled person would appreciate the usefulness of the haplotyping techniques. There is nothing to suggest that it would be a successful method for looking at the ancestry of males with the same surname, let alone males with different surnames. Therefore, I am not convince that D1 would encourage a skilled person to take the extra step and analyse the haplotype data of males with different surnames, and so in my opinion claim 4 does not lack inventive step in light of this document.
- 61 I therefore conclude that claim 4 lacks inventive step in light of the disclosure of D2-D4, and that claim 5 lacks inventive step in light of the disclosure of D1-D4.

Opinion

- 62 I conclude that claims 4, 5 and 6 are novel over the documents submitted by the requester. I also conclude that claim 7 is not novel in light of documents D1-D3 submitted by the requester.
- 63 I also conclude that claim 5 does not involve an inventive step in light of each of the documents submitted by the requester, and that claims 4 and 6 do not involve an inventive step in light of documents D2-D4 submitted by the requester. I also conclude that claim 7 does not involve an inventive step in light of D4.

Application for review

- 64 Under section 74B and rule 98, the proprietor may, within three months of the date of issue of this opinion, apply to the comptroller for a review of the opinion.

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.

Rowena Dinham
Examiner