

- 7 The applicants submitted further amendments and observations but these failed to convince the examiner that the invention was patentable. It was agreed that further correspondence was unlikely to resolve this issue and the matter came before me at a hearing on 10 June 2004, in which the applicants were represented by Mr. Avi Freeman of Beck Greener, Patent and Trade Mark Attorneys.

The application

- 8 The application relates to a computer system for the automatic selection of securities for an investment portfolio. An investor selects investment characteristics, such as the risk (s)he is willing to take, and investment limits, such as the spread of investment, which (s)he considers important. The system then constructs a characteristics matrix on the basis of those investment characteristics and limits and all the candidate securities available. An objective function is then established corresponding to the characteristics matrix and finally the portfolio content is selected on the basis of the characteristics matrix and the objective function.
- 9 The claims in their latest form (filed 9 June 2004) include independent claims 1,10,19 and 21. Claims 1, 10 and 21 read as follows:

1. A method of operating a computer, the method comprising:

at a computer receiving first input data relating to selected investment characteristics and investment limits considered important for an investor's requirements;

at a computer receiving second input data means relating to a selected safety level for a portfolio of securities;

in a computer constructing a characteristics matrix having entries corresponding to (a) selected characteristics and limits, and (b) all candidate securities;

in a computer establishing an objective function corresponding to the characteristics matrix; and,

in a computer using linear programming to enable determination of the securities portfolio based on the characteristics matrix and the objective function.

10. A device for enabling automatic selection of a securities portfolio from a plurality of securities, the device comprising:

means for receiving first input data relating to selected investment characteristics and investment limits considered important for an investor's requirements;

means for receiving second input data means relating to a selected safety level for a portfolio of securities;

means for constructing a characteristics matrix having entries corresponding to (a) selected characteristics and limits, and (b) all candidate securities;

means for establishing an objective function corresponding to the characteristics matrix;

and,

means for determining using linear programming the securities portfolio based on the characteristics matrix and the investor's objective function.

21. A computer program containing a set of instructions for:

producing a characteristics matrix construction, having entries corresponding to (a) selected characteristics and limits and (b) all candidate securities;

producing, from a particular investor's stated investment requirements an objective function based on a corresponding set of security's characteristics; and,

production of an optimum portfolio for a particular investor using linear programming by the input of the characteristics matrix, and the investor's objective function and any constraints imposed by the investor into an optimization program.

10 For the sake of brevity I have not reproduced claim 19 which is of the same form as claim 1 but which includes some additional limiting features. Furthermore, at the hearing the examiner raised concern that claim 19 as amended contained matter extending beyond that originally disclosed contrary to section 76. Thankfully that issue has now been resolved by the amendments filed on 12 July 2004.

The law

11 The examiner has maintained that the application is excluded from patentability under Sections 1(2)(a) and 1(2)(c) of the Act, as relating to a mathematical method, a method for doing business and a program for a computer as such. The relevant parts of this section read:

“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)

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

(d)

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

12 These provisions are designated in section 130(7) as being so framed as to have, as nearly as practicable, the same effect as Article 52 of the European Patent Convention, to which they correspond. I must therefore also have regard to the decisions of the European Boards of Appeal that have been issued under this Article in deciding whether the invention is

patentable.

Interpretation

13 It is a well established principle of UK patent law that an invention does not relate to one of the excluded areas *as such* if it makes a “technical contribution”.

14 This interpretation follows the decision in *Fujitsu Limited’s Application [1997] RPC 608*, in which Aldous LJ said at page 614:

“However, it is and always has been a principle of patent law that mere discoveries or ideas are not patentable, but those discoveries and ideas which have a technical aspect or make a technical contribution are. Thus the concept that what is needed to make an excluded thing patentable is a technical contribution is not surprising. That was the basis for the decision of the Board in *Vicom*. It has been accepted by this Court and by the EPO and has been applied since 1987. It is a concept at the heart of patent law.”

15 That this test should apply across all the areas covered by section 1(2) was made clear in the Patent Office Practice Notice issued on 24 April 2002 entitled “Patents Act 1977: interpreting Section 1(2).”

16 It is also a well established principle in UK patent law that when assessing whether an invention relates to excluded subject matter, it is the substance of the invention that is important, not its form. For example in *Merrill Lynch’s Application [1989] RPC 561*, Fox LJ stated at page 569:

“It cannot be permissible to patent an item under section 1(2) under the guise of an article that contains that item – that is to say, in the case of a computer program, the patenting of a conventional computer containing that program. Something further is necessary.”

17 The divergence between this approach and that taken by the EPO Board of Appeal in *Pension Benefit System Partnerships [2002] EPOR 52 (T931/95)* was addressed at the hearing. Indeed it has been discussed before the Comptroller’s hearing officers on a number of occasions, most notably in *Hutchin’s Application [2002] RPC 8* and in *Pintos Global Solutions’ Application SRIS 0/171/01*. On both those occasions the hearing officer felt bound to follow the approach adopted by the UK courts where there was a divergence in practice. I can see no reason to come to a different conclusion in this case: In assessing whether an invention is patentable, the form of wording employed to define the invention in the claims is irrelevant. What I must do is identify the substance of the invention defined in the claims when properly construed and decide if that amounts to an excluded item as such. That the EPO chose to treat apparatus claims differently from method claims in *Pension Benefits* is of no bearing.

18 I agreed with Mr Freeman at the hearing that the same burden of proof should be applied when assessing whether an invention is excluded from being patentable as applies in other pre-grant issues, namely that the benefit of the doubt should be given to the applicant. That

this is so was confirmed by Laddie J when *Fujitsu Limited's Application* was considered in the Patents Court. In his decision¹ Laddie J said:

“Therefore the onus lies on the person contesting patentability to prove that the alleged invention falls foul of the statutory exclusion. Furthermore, at the patent office stage, the benefit of the doubt should be given to the applicant.”

19 That is the standard I shall apply.

Argument

20 In arguing that the invention was patentable at the hearing, Mr Freeman focused most of his attention on apparatus claim 10. I shall do the same in this decision, it following from the above that should I find claim 10 to be patentable, then equivalent method claim 1 (and the other claims) will also be patentable.

21 There is, I think, little doubt that the activities with which the invention is concerned, namely the selection of securities in an investment portfolio, are business activities. Certainly Mr Freeman did not seek to argue against this. I therefore consider the invention to be potentially caught by the business method exclusion. Similarly, there is little doubt that the invention is implemented in software and is therefore potentially caught by the computer program exclusion. The existence of claims specifically to the program leaves little scope for argument to the contrary.

22 The examiner has also raised the objection that the invention is excluded as a mathematical method. This was not discussed in any detail at the hearing but I still need to consider it here. It is undoubtedly the case that the computational means employs a mathematical method to determine the end result. However, I am not convinced that when viewed in its entirety, the invention can be said to be no more than a mathematical method. The Board of Appeal of the EPO in *Vicom/Computer related invention* [1987] 1 OJEP (T208/84) defined a mathematical method as one which is carried out on numbers and provides a result in numerical form. I am prepared to accept that definition here. In my opinion, neither the input to, nor the output from the present invention are pure numbers and I consider the invention to be more than a mathematical method.

23 Having found the invention to be potentially caught by the business method and computer program exclusions is not however, the end of the matter. To be excluded under section 1(2), an invention must relate to excluded matter “as such”. And as I have said above, if an invention makes a technical contribution, it does not relate to excluded matter as such. What I must now decide is whether the invention makes such a technical contribution.

24 Mr. Freeman sought to impress upon me that the claimed invention made the required technical contribution from two principal sources: that the problem addressed by the invention was a technical one and that the overall solution was equally technical.

25 As Mr. Freeman saw it, the problem the invention sought to overcome was how to make an

¹ [1996] RPC 511 page 533, line 5

optimum selection from the vast number of available options. According to the description, existing databases which are used by analysts to assess the likely future performance of investments contain information on thousands of companies. Mr Freeman said that if an investor were to seek to invest in say 10 securities then selection of an optimum combination would require consideration of approximately 10^{25} different combinations. In Mr Freeman's view the human mind was simply not capable of doing that.

26 Mr Freeman sought to draw a distinction in this respect between the present invention and that in *Fujitsu*. In that case, he said, the Court of Appeal decided that the invention was not patentable because it merely automated what was done manually. Since the human mind was not capable of doing the calculation conducted by the present invention, he said, then it followed that the invention could not merely be automation of a known manual process. Thus, in Mr Freeman's opinion, the invention was patentable.

27 I am not persuaded by that argument. In *Fujitsu*, the Court of Appeal accepted that that invention provided a new tool for modeling crystal structures which avoided labour and error. However at line 40 on page 618 of his decision, Aldous LJ said:

“But those are just the sort of advantages that are obtained by the use of a computer program. Thus the fact that an application provides a new tool does not solve the question of whether the application consists of a program for a computer or whether it is a program for a computer with a technical contribution.”

28 What the present invention does is assess a client's requirements and limits, and construct an optimum portfolio from all the available options using known programming techniques. To my mind that is exactly the sort of service I would expect a financial advisor to provide. Using a computer to do this allows a better portfolio to be developed because more options can be taken into account. But that is just the sort of advantage Aldous LJ said he would expect to follow from using a computer to perform a task. I can see no technical contribution in doing that.

29 Mr Freeman took this line of argument one step further. He argued that even a conventionally programmed computer would be unable to cope with the number of combinations required to calculate the optimum solution in the present case. I am in no doubt that choosing the optimum combination from amongst 10^{25} possible combinations is an extremely difficult problem. To put that into perspective, assuming that a conventional computer can perform on the order of 10^9 calculations per second, it would take approximately 10^9 years to determine all possible solutions. The applicant's solution to this problem was to employ linear programming and an objective function to vastly reduce the number of calculations to be performed, thereby rendering the problem more tractable.

30 Again though, I do not consider that to be sufficient for the invention to be said to make a technical contribution. As Mr Freeman accepted, linear programming and objective functions are known techniques for making calculations more manageable. Thus the specific method by which the calculation is performed cannot of itself, it seems to me, provide the source of any technical contribution.

31 That leads me to consider the issue of the field in which the invention is employed. Mr Freeman drew my attention to the decision of the Board of Appeal of the EPO in *Sohei* [1996] EPOR 253 (T769/92) as evidence to support his assertion that when assessing whether an invention was patentable, I should not be distracted by the field in which the invention was used. In furthering this line of argument, Mr Freeman asked me to consider the hypothetical scenario of an invention where such techniques were used to optimize the transmission system in a vehicle. Such an invention, he said, would be deemed to be patentable. And if such a system was patentable, he argued, so should the present invention. Whilst I agree entirely that an invention is not unpatentable just because it is used in an excluded field, I find Mr Freeman's argument in relation to the present invention to be flawed.

32 In his vehicle transmission scenario, any technical contribution would seem to arise from the use of the known optimization technique in the manufacture of vehicle transmissions. But the manufacture of vehicle transmissions is undoubtedly a technical field. Selecting security portfolios is not. I fail to see how any technical contribution is provided merely by using a known technique to conduct an excluded activity.

33 With further reference to *Sohei*, Mr. Freeman said that in coming to its decision in that case, the Board took the view that the precise type of data, financial and inventory, should be disregarded when assessing patentability. He said that in applying the same principle to the present case you could generate a claim amounting to:

- receiving first input data,
- receiving second input data,
- constructing a characteristics matrix,
- establishing an objective function, and
- using linear programming to determine an optimized result.

34 According to Mr Freeman such a claim would, following *Sohei*, be patentable. Whilst of course I agree that a claim shorn of its excluded matter can be patentable, to be so it must still make a technical contribution. I cannot, however, see anything in the contextless claim Mr Freeman proposed which could be said to provide that technical contribution. It amounts to no more than receiving various data, creating a matrix and using a known technique to produce an undefined optimum result.

35 Another line of argument Mr Freeman pursued was that a technical contribution was provided by the way the hardware operated when putting the invention into practice. Put another way, in Mr Freeman's opinion, the invention provided a platform which enabled the problem of selecting an optimum combination of securities from the huge number of possibilities available to be solved. However, merely using a computer is not sufficient to make an invention patentable. Nor is the fact that it does something useful. If it were, then the Court of Appeal would have come to a different conclusion in *Fujitsu*. Clearly if the hardware is new then that would provide the required technical contribution. However, having read the specification in its entirety I have found nothing to suggest that the hardware employed to implement the present invention is anything other than conventional. Nor did

Mr. Freeman try to convince me otherwise. Moreover, the hardware elements appear to me to perform their usual function and interactions with one another, within the system. Therefore, I can find no technical contribution provided by the means employed to perform the invention.

36 But I must also consider the contribution from the software: does the running of the program in the present invention result in a computer which operates differently at a technical as opposed to a functional level?

37 This distinction between technical and functional operation is discussed at paragraph 1.26.9 in the Manual of Patent Practice with regard to the decision of the EPO Board of Appeal in *IBM/Document abstracting and retrieving* [1990] 1-2 OJEPO 12 (T22/85) where the Board said:

“..... the mere setting out of the sequence of steps necessary to perform the activity in terms of functions or functional means to be realized with the aid of conventional computer hardware elements does not import any technical considerations and can, therefore, neither lend a technical character to the activity nor to the claimed subject matter as a whole”

38 As the Manual explains, this decision is taken to mean that any technical effect achieved within the computer must be over and above any effect present merely as a consequence of the use of functionally defined means of the kind that are to be found in a conventional computer. After careful consideration I firmly believe that in the present invention, any change in operation of the computer results from the functions it is programmed to perform, not in the technical way that they are performed. And in my view that does not constitute the further technical effect *IBM* requires.

39 The final avenue Mr Freeman pursued was that the invention made a technical contribution in that the particular techniques adopted led to an increase in processing speed. In developing that argument, Mr. Freeman referred to *Vicom* which was considered patentable by the EPO Board of Appeal. Mr Freeman said he felt the Board had decided that it was patentable on the basis of the increase in the processing speed it produced, similar to the one provided by the present invention. In support of this opinion, Mr Freeman took me to the decision of Fox LJ in *Merrill Lynch* where he said at line page 569:

“The nature of the addition is, I think, to be found in the *Vicom* case where it is stated: “Decisive is what technical contribution the invention makes to the known art”. There must, I think, be some technical advance over the prior art in the form of a new result (e.g. a substantial increase in processing speed as in *Vicom*)”.

40 I have some sympathy with Mr Freeman’s view that this passage suggests that an increase in processing speed should be sufficient for an invention to be viewed as making a technical contribution. However, as I said at the hearing, in his decision in *Fujitsu Aldous* LJ came to a different view when considering the exact source of the technical contribution in *Vicom*. At line 49 on page 615 of his decision he said:

“The reasoning in *Vicom* as to what was the technical contribution is not easy to

ascertain...As I read the decision, the Board saw a technical contribution, namely the generation of the enhanced picture”

41 I do not feel able to simply to ignore the comments of Aldous LJ, particularly since they were made later than, and in full knowledge of, those of Fox LJ in *Merrill Lynch*. In my opinion, the context of the increase in processing speed referred to by Fox LJ cannot be ignored when identifying the source of the technical contribution in *Vicom*. It is an increase in processing speed in a technical field, namely image enhancement. However, in the present case, the only increase achieved is in the rate of processing financial information by using known computing techniques. That is not a technical field and cannot to my mind make a technical contribution.

42 Mr. Freeman also drew my attention to two granted EP patents: EP 1129615B and EP 1034476B. Briefly stated the former relates to the use of an objective function to select genotypic or phenotypic characteristics for breeding plant or animal varieties, whereas the latter relates to the use of linear programming to verify the simulated operation of a system. Thus these granted patents employ at least some of the same steps performed by the claimed invention. However, such consideration is to my mind of very limited value. Whilst it is always attractive to look to patents that have been granted previously to supplement an applicant’s case, I am not bound by what has been granted before. Each case must be considered on its merits

Summary

43 It seems to me that the contribution the invention makes is in the use of known computation techniques to carry out a calculation in a business process, namely the selection of securities in an investment portfolio. The computerisation may well mean that calculations can be performed more quickly than previously, such that more possibilities can be taken into account. But that is a familiar benefit of computerisation. The hardware seems to be entirely conventional and I can find nothing in the field of use of the invention, or in the way that the hardware operates when running the program such that it could be said to produce a new result in the form of a technical contribution.

Conclusion

44 I have found that the invention as claimed in this specification is a method for doing business and a program for a computer, and that it fails to provide the technical contribution required to prevent its exclusion from patentability. Having read the specification thoroughly I have been unable to identify anything contained therein which could form the basis of a patentable invention. Accordingly I refuse the application under Section 18(3) on the grounds that the claimed invention is excluded under Section 1(2)(c).

Other matters

- 45 The issues of novelty and inventive step have been deferred pending my decision on whether the invention relates to excluded matter. Should my decision on that issue be overturned on appeal, then further consideration of novelty and inventive step will be necessary.

Appeal

- 46 Under the Practice Direction to Part 52 of the Civil Procedure Rules, any appeal must be lodged within 28 days.

A BARTLETT

Deputy Director acting for the Comptroller