BL O/198/06

19 July 2006

PATENTS ACT 1977

APPLICANT Touch Clarity Limited

ISSUE Whether patent application number GB 0105616.7 complies with section 1

HEARING OFFICER A Bartlett

DECISION

Background

1 This decision is concerned with the issue of whether Touch Clarity Limited should be granted a patent for the invention defined in application number 0105616.7 which was published as GB2373347. More particularly, I have to decide whether the invention is excluded under section 1(2)(a) and (c) of the Act.

2 To help me decide the issue the Applicants' Patent Attorney, Mr Graham Ablett (of Ablett & Stebbing) and the inventor Mr Paul Phillips attended a hearing before me on 4 November 2005. The examiner, Mr Ben Widdows also attended.

The law

3 The examiner has reported on numerous occasions that the application does not meet the requirements of the Act because the invention defined in the claims relates to excluded matter. The relevant sections of the Act are:

> "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 –
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> (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 purpose of this Act only to the extent that a patent or application for a patent relates to that thing as such."

4 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 (EPC), to which they correspond. I must therefore also have regard to the decisions of the Boards of Appeal of the European Patent Office that have been issued under this Article in deciding whether the invention is patentable although I am not bound to follow them.

Interpretation

5 At the hearing there was considerable discussion as to the test I should apply in deciding whether the invention was excluded. This was hardly surprising given the intense scrutiny that the courts have given to the exclusions in recent times. In particular, in his judgment in *CFPH*[1] Deputy Judge Peter Prescott QC considered at length the reasoning behind the various exclusions and their effect. In addition he considered the difference in approach adopted to decide patentability in the UK and in the European Patent Office and, having found there to be shortcomings in both, proposed an alternative test. In doing that the Deputy Judge was seeking to avoid the problem inherent in the old "technical contribution" test that there is no (and is never likely to be) any accepted definition of "technical". Whilst in his opinion that did not cause a problem for the majority of patent applications he considered it problematic on the borderline of patentability. He therefore proposed an alternative two stage test for assessing such cases which can be summarized as

> i) Identify what is the advance in the art that is said to be new and not obvious (and susceptible of industrial application).
>
> ii) Determine whether it is both new and not obvious (and susceptible of industrial application) under the description "an invention" in the sense of Article 52 of the European Patent Convention (EPC) — broadly corresponding to section 1 of the Patents Act 1977.

6 Mr Ablett was not entirely comfortable with my proposition that that was the test that I should apply in deciding the present issue. He noted that the Deputy Judge in *CFPH* had introduced the concept of hard and soft exclusions in his judgment and had reached his conclusions in that case having categorized business methods and computer programs as "hard". However, Mr Ablett correctly pointed out the *CFPH* judgment omitted to explain how mathematical methods, mental acts or hybrid inventions should be categorized. As those were potentially relevant to the present invention Mr Ablett suggested the *CFPH* test was not appropriate. Instead he indicated that he thought I should apply the previous "technical contribution" approach to decide whether the invention was patentable. Indeed he went to great lengths to explain to me the technical contribution that the invention made and how it would have been patentable prior to *CFPH*.

7 The issue of how to decide whether an invention is patentable has been considered by the courts on a number of occasions subsequent to *CFPH* (and the hearing on this case). Indeed I expressly gave the Applicants the opportunity to make further

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1 CFPH LLC's Application [2006] RPC 5

submissions to me in light of the judgments in *Crawford*[2] and *Shopalotto*[3]. Whilst the judges in those cases have all used slightly different wording to elucidate the test, I have no doubt that the test adopted in all these cases is fundamentally the same as the one the Deputy Judge applied in *CFPH*. Thus I shall apply the *CFPH* test in the present case, subject to one qualification which is that in applying the test it is the substance of the invention that is important rather than the form of claim adopted. This is a long established principle of UK law (see *Merrill Lynch*[4] and *Fujitsu*[5] for example) and was incorporated into his version of the *CFPH* test by Pumfrey J. in his judgment in *RIM*[6] where he said at paragraph 86:

> "It is now settled, at least at this level, that the right approach to the exclusions can be stated as follows. Taking the claims correctly construed, what does the claimed invention contribute to the art outside excluded subject matter?"

8 One other thing that those other judgments have made clear is that the *CFPH* type test is not inconsistent with the "technical contribution" approach first introduced by the EPO Board of Appeal in *Vicom*[7] and endorsed by the Court of Appeal in *Merrill Lynch* and *Fujitsu*. Thus in applying the *CFPH* test to the present case I will also consider whether the invention makes a "technical contribution". If I can identify a contribution to the art that is technical, I will take that as indicating that the contribution probably lies outside the excluded area and that the invention is patentable.

The application

9 The application concerns a controller for controlling a system to carry out one of a range of candidate actions so that an objective function of the system is optimized. The claims on file before the hearing were filed on 7 September 2005 and comprised one independent claim directed to a control system for actuating an unspecified operating system and 11 dependent claims. At the hearing I was asked to consider the allowability of some further claims, the precise wording of which was confirmed in correspondence from Mr Ablett on 7 November. Thus the claims upon which I must base my decision comprise 4 independent claims of which claims 1 and 15 are system and method claims respectively where the system being controlled is unspecified and claims 20 and 32 which are system and method claims which specify that it is a robotic operating system that is being controlled. For completeness I have reproduced all 4 independent claims in Annex A.

10 At the hearing, attention was primarily focused on the first of these claim groupings, namely claims 1 and 15. Accordingly that is where I shall begin. Indeed should those claims be patentable then I think it follows that claims 20 and 32 are as well. However in the event that I find the first grouping to be unpatentable, I will need to consider the second grouping separately.

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2 Crawford's Application [2006] RPC 11
3 Shopalotto.com Ltd's Application [2006] RPC 7
4 Merrill Lynch's Application [1989] RPC 561
5 Fujitsu Limited's Application [1997] RPC 608
6 Research in Motion vs Inpro Licensing SARL [2006] EWHC 70 (Pat)
7 Vicom/Computer related invention T208/04

11 I have some reservations about how clearly the claims define the invention, an issue which should ideally have been resolved before the hearing. First, claim 1 is something of a hybrid claim – initially it purports to be a system claim before metamorphosising into a method claim defined solely in terms of various means. I have to say this is far from an ideal formulation. Of more concern to me though is the actual way that the substance of the invention is defined. From reading of the description, the crux of the invention resides in the way the system selects the next option by balancing previous experience with a degree of exploration of other options. However, in my opinion that crucial aspect of the invention is not brought out clearly in the independent claims which instead rely upon the concept of "regret" to define the invention. Indeed I found it necessary to question Mr Phillips and Mr Ablett at some length on this point at the hearing.

12 More particularly, the claims state that the next action is chosen from all the available options

> "on the basis that it is likely to cause the lowest expected growth in regret after that next action is performed by the operating system, where regret is a term used for a shortfall in response performance between always performing the true best candidate action and actually performing the candidate action chosen to be next performed".

13 When I put it to him that claim 1 as presently drafted included no requirement for exploration, Mr Ablett vigorously disagreed. He said that even if it was not explicitly contained in the claim, it was certainly implicit. I am not convinced by his argument on that point. Indeed I can envisage a situation where the expected growth of regret as defined in the claim is minimized without any exploration taking place. The description acknowledges (in the paragraph spanning pages 3 and 4) that the true best selection is the option that would be taken if one knew everything that could ever be known about all the options possible. Of course no system could ever have such a comprehensive knowledge base and so the decision on which of a number of options to choose has previously been taken on the basis of all the past experience encountered within a system. In such a situation the system is not necessarily presented with the true best candidate but a best estimate based on past experience. To my mind that still falls within the definition of "regret" in claim 1 without any exploration necessarily being undertaken.

14 In fact exploration is only specifically addressed in claim 9 which is concerned with the feature of forcing the system to undertake a degree of exploration by causing each candidate action to be chosen a minimum number of times or at a minimum rate.

15 As a consequence I have serious doubts as to whether the invention defined in claims 1 and 15 is actually distinguished from the prior art. I certainly do not think they define the invention for which protection is sought. Those issues are however a matter of drafting and are potentially resolvable. My primary concern is in deciding whether in substance the invention is excluded.

16 Whilst it may not be clear from claims 1 and 15, it is clear from the description that determining the appropriate degree of exploration is central to the invention: it has to be

sufficient to ensure that an optimal solution is not ruled out by relying too heavily on previously tried options whilst at the same time not being excessive such that sub-optimal options are selected too often. It is by getting the optimum balance between experience and exploration that "minimizing the rate of growth of regret" in the claims is achieved. Irrespective of what the claim actually says on this point, I will consider that exploration aspect to form a crucial aspect of the invention in my determination of whether the invention is patentable. I will return to the issue of the potential for amendment of the claims to better define the invention later.

17 At this stage I think it appropriate to say something about the content of the application. The specification contains some 54 pages of description. The vast majority of that description (and the drawings) is concerned with what the Applicants call "customer relationship management "(CRM) which is said to relate to "the hardware, software and business practices designed to facilitate all aspects of the acquisition, servicing and retention of customers by a business". In short, much of the description relates to embodiments which are concerned with issues like maximizing monetary returns from a website, maximizing insurance policy renewal rates via a call centre or minimizing the rate of attrition of customers from websites. As an example of this, the description includes an embodiment for buying greetings cards from a website where the customer is presented with cards (s)he is likely to want to purchase based on previous choices, a degree of exploration and characteristics like gender, age and the like (the idea being that the likelihood of a sale is maximized by presenting the cards most likely to be purchased to the user first).

18 The specification is not solely limited to this sort of application however. The opening paragraph of the description states that "in particular, the present invention relates to controllers for systems presenting marketing propositions on the internet, **but is not limited thereto**." What is more, the embodiment described in the final page and a half of the description concerns a controller for a robot vacuum cleaner. Thus the invention is envisaged as being used in a range of fields at least some of which may fall within the excluded subject matter areas. However, as Mr Ablett correctly argued, just because an invention can be used in an excluded activity such as a business activity does not mean it is necessarily excluded. If it makes an advance in a non-excluded field it is patentable.

19 The specification also includes an 8 page appendix entitled "Formal expression of the Optimisation" which sets out the detailed mathematical theory through which the minimal growth of regret (experience/exploration balance) is achieved.

20 During the hearing I questioned Mr Ablett and Mr Phillips in detail about the contents of the application. When questioned about the choice of embodiments, Mr Ablett and Mr Phillips said that this was purely a matter of convenience – they had selected embodiments which the reader would be readily able to visualise. They said that the fact that they could be seen as business uses of the control system was irrelevant - they could equally well have described embodiments where their control system was used to control a wood turning machine or the rudder of a sailing boat. However, they said, the operation of such systems would have been far less familiar to most readers and that would not have aided understanding of the invention. The key point in their

argument was that what the control system was being used to control was irrelevant; the invention resided in the way the control system operated. They said the control system had a very broad range of potential fields of use and hence the Applicants were entitled to the breadth of protection sought in claims 1 and 15. They added that I should read nothing into the fact that there was no claim to the use of the control system to control a customer relationship management system.

21 When I put it to them that the contents of the appendix was basically a mathematical method they argued that that was simply the most convenient way to explain the concept of regret: it could equally well have been expressed in purely descriptive terms. They said that the fact that they had chosen the mathematical formulation for explaining regret did not alter the underlying patentable nature of the invention.

22 I will need to consider all these issues in applying the *CFPH* test.

The *CFPH* test.

23 Before I go on to apply the two specific elements of the *CFPH* test I think I need say something on the issue of substance vs form. It is a long established principle of UK patent law[8] that it is the substance of the invention that is to be considered when deciding whether an invention relates to excluded matter. In essence this means that you cannot take an inherently unpatentable invention and make it patentable by specifying for instance that it is implemented by some conventional apparatus. Thus the computer program exclusion is not avoided by claiming a system comprising entirely conventional hardware running the program. I am mindful however that that does not mean it is right to ignore the claims altogether in favour of what the description says. Given the imperfect claim formulation in the present case I have found it necessary to look to the description more than usual to identify the substance of the invention. I stress however that I have not discarded the claims altogether.

24 Mr Ablett put it to me at the hearing that the claims specified a host of technical elements which were not (either individually or in combination) excluded. Consequently he said, the claims could not be said to relate to excluded matter as such. In particular he pointed to the monitoring means, the storage means, the assessing means, the actuating means and updating means specified in claim 1. I am not persuaded by this argument. The actuating means are not specified. The storage, assessing and updating mean are all it seems to me standard elements of a computer system. And as the application acknowledges at page 30, it was well known in the CRM field at the filing date of the application to use off and online analysis of the effectiveness of presentation campaigns. It seems to me to be inevitable that any such system would have to include monitoring means as required in the claims.

25 What is more, in clear contrast to the way the EPO assess excluded matter, the UK courts have made it abundantly clear that the presence of conventional hardware elements in the claim does not mean the exclusions are avoided. Indeed, Peter Prescott QC made it clear in the *CFPH* judgment that this was a significant shortcoming

8 See Merrill Lynch, quoted by Aldous LJ in Fujitsu at page 614

of the *Hitachi*[9] approach (even if through the subsequent approach to considering inventive step it did not in practice affect what was patentable). Thus the presence of hardware in the claims is not of itself sufficient to overcome the exclusions under UK law. The claims must make an advance in a non-excluded field to be patentable.

26 The first specific step in the *CFPH* test is to identify the alleged advance made by the invention. The introductory section of the description sets out at some length how "customer relationship management" has been carried out in the past and on page 7 recognizes the shortcomings of approaches relying solely on historic experience. In doing so it refers to the greetings card sales example and describes a sub-optimal system whereby a number of cards which might well have been attractive to a customer are not presented to them because they have not been presented in the past and thus have a low or zero success rate. That perpetuates the low success rate and the card is never presented. Thus according to the description, prior art systems may have presented a temporary optimal solution but that would not necessarily have been a sustainable one.

27 At page 10 the Applicants acknowledge that it is known to address this strict reliance on past experience by forcing the system to adopt a random, low level of exploratory activity. It states however that it is difficult to set this level of exploratory activity at the right level such that the system is confident that it is tracking the optimum solution whilst minimizing the cost of the sub-optimal exploratory activity. It is this problem that the invention seeks to overcome and thus I consider the advance made by the invention to be the way that the optimum balance is achieved between experience and exploration in selecting the next option to be proposed in a control system.

28 Having identified what I consider to be the alleged advance, what I must now do is decide whether that is new and not obvious (and susceptible of industrial application) under the description "an invention" in the sense of Article 52 of the EPC.

29 The Applicants have admitted that they have chosen to describe the optimization process as a mathematical process. At the hearing Mr Phillips said that was done as a matter of convenience and that it could have been expressed in other ways. The invention was not, he said, a mathematical method.

30 I am not convinced by that argument. There is I think no escaping the fact the Applicants did choose to describe the experience/exploration optimization process as a mathematical method. Moreover, (and I think this is particularly compelling) it is stated on page 31 of the description that the "subject of this application is a system which uses recently developed and specialized quantitative methods which offer significant efficiency gains. These are defined as cost-gain approaches and are described in Appendix I". That passage leaves me in no doubt that at the heart of the invention is an algorithm for deciding which option to present to a controller. That may be an advance over what has been done before, but having considered the specification and all the arguments put forward, it is my view that that advance is a mathematical method and is thus not an advance in a non-excluded field.

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9 Hitachi/Auction Method T258/03

31 Furthermore, I don't think there is any doubt that this method is implemented as a program for a computer. All the embodiments disclosed are implemented using computer systems and there is no suggestion that any of the hardware employed is anything other than entirely conventional. Mr Ablett stressed at the hearing that just because an invention uses a computer program does not mean that an invention is not patentable. Whilst I agree with him entirely on that point, I do not think it is decisive in the present case.

32 In support of his argument that the present invention was not excluded as a program for a computer as such, Mr Ablett drew upon Deputy Judge Prescott's "little man" test from the *CFPH* judgment. The essence of the little man test is that if the computer program can be replaced by a little man sitting at a console issuing decisions, then the program is merely a tool for implementing the invention rather than the invention being a computer program as such. He then illustrates the test with reference to the manufacture of canned soup or control of an autopilot.

33 Applying this to the present case, Mr Ablett said that whilst the present optimization calculation would be very onerous to perform manually, there was no reason why, given enough time, a human operator could not carry out the calculation and present the optimum option to the operating system. This, said Mr Ablett, showed that the program was simply a tool for implementing the invention and that the invention was not about programming at all.

34 I do not find that argument persuasive. At paragraph 105 of his judgment, Peter Prescott QC went on to say:

> "Of course if it (the invention) were about better rules for running a business the idea would not be patentable."

35 This I think provides a crucial qualification of the "little man" test – a computer implemented invention does not become patentable merely because the commands could be issued by a human operator; there must still be a patentable advance which can be provided by what the computer program is used to control. That the optimization process in the present invention could be carried out by a little man is not in my view sufficient for the computer program exclusion to be avoided in the present instance.

36 Having carefully considered all the arguments put forward, I consider the optimization process at the heart of the invention to be a mathematical method and/or a program for a computer, both of which are *potentially* excluded.

37 However, that is not the end of the matter. In *Vicom*, the EPO Board of Appeal made it clear that whilst a mathematical method was not of itself patentable, a practical application of such a method could be. That approach was endorsed by the Court of Appeal in *Fujitsu* and (more recently) in *Halliburton*[10]. The issue I need to address in the present case is, it seems to me, whether the abstract concept I have identified above as being at the heart of the invention is sufficiently tied to any practical, technical

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10 Halliburton Energy Services Inc vs Smith International (North Sea) Ltd [2006] RPC 2 & 3 para 216.

application to render it patentable ie so that it does not relate to those items *as such*.

38 Mr Philips and Mr Ablett went to great lengths in arguing that it was. They put it to me that even in claims 1 and 15 (which of course include no limitation as to the type of system being controlled) the invention could not be viewed as an abstract mathematical method as such. Rather, they argued, the claims defined the use of that mathematical method for controlling an operating system. That they said was patentable. What is more it was, they said defined in terms of actual hardware such that it could not be described as relating to those abstract concepts as such.

39 I have already found above that the presence of conventional technical means in claims 1 and 15 does not mean an invention avoids the exclusions but in further support of their argument, Mr Ablett identified various advantages provided by the invention as illustrating the patentable advance it made. Those advantages are best summarized in his letter dated 15 November where it was stated:

> "Applying the analysis described in paragraph 10 of the *Shopalotto* decision to the present invention, the inventor has contributed a control system which has the technical contribution or effect of being able to learn about an interaction environment without previously stored data, being able to learn about the interaction environment more quickly than prior art control systems, being able by the learning process to zero in on the best course of action quickly, and by virtue of the aforementioned balancing being able to conduct a degree of experimentation so as to maintain more accurate knowledge of the interaction environment in a real time manner, and being able to learn new functions that an operating system may have. These are not aspects of an economic nature or aesthetics or presentation of information. On the contrary, they are effects which enable the control system or "brain" to function better than the known control systems."

40 On the face of it that might appear to be an attractive argument. However I do not consider that it stands up to closer scrutiny. Those effects are achieved as a direct consequence of the specific optimization technique employed which I have found to be excluded. Following *Vicom* and *Halliburton*, that optimization technique will only provide an advance in a non-excluded field if it is tied to a non-excluded application.

41 The specification discloses a range of fields of application for the control system. One of these is the control of a robot, and more specifically a robot vacuum cleaner. I will come back to this embodiment later but I think it fair to say that incorporating the control system into a robot vacuum cleaner would constitute a practical application of the sort that *Vicom* tells us is capable of making an otherwise excluded item patentable. However, the description also discloses (indeed majors on) the use of the system in a customer relationship management context. In particular much of the description is concerned with the way that products that an online shopper is likely to want to buy are promoted to him or her, the ultimate goal being to maximise the amount of money that the customer spends. To my mind that is a business activity and cannot be said to be the sort of use that could make an otherwise excluded item patentable. Thus at least some of the fields of use of the unpatentable optimization process are themselves

excluded.

42 The comments of Pumfrey J in *Halliburton* which I put to Mr Ablett at the hearing are I think of direct relevance to this point. *Halliburton* was concerned with a method of designing drill bits for use in the oil exploration industry and Pumfrey J said at para 216 of his judgment:

> "216….An untethered method claim may well cover activities which have nothing to do with any industrial activity, but, if the claim is tied down to the industrial activity it becomes a valuable invention restricted to its proper sphere. What cannot be plausibly suggested is that the method is not freighted with the technical effect that is needed for patentability: but the scope of the claim should be restricted to its technical field.
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> 217 In the present case, claims 1 and 3 are directed to purely to the intellectual content of a design process, and the criteria according to which decisions on the way to a design are made…..Thus they are firmly within the forbidden region as schemes for performing a mental act. So I think that these claims are bad because they are too broad, but an amendment of the type described in T0453/91 should dispose of the problem.
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> 218 It might be supposed that such amendment does not affect the position 'as a matter of substance', but I think this is quite wrong. The objection, in my view, is to width of claim alone when the method has potential industrial utility, that is, a potential technical effect. The objection to the claims in this case are to the form of the claim, not to the substance of the invention."

43 I think this is on all fours with the present application: The method of selecting options so as to minimize the growth of regret is not of itself patentable but it could form the basis of a patentable claim if suitably tied to a technical application. However, claims 1 and 15 contain no such limitation. What is more, at least some of the uses described and covered by claims 1 and 15 are in an excluded field. Indeed, I have no doubt that a claim for controlling customer relationship management utilizing the optimization process would have been excluded had one been included. There is of course no such claim. That however does not alter the position that the claim encompasses subject matter that does not provide an advance in a non-excluded field. And a claim seeking protection for excluded matter is a bad claim. I therefore find claims 1 and 15 to be unpatentable notwithstanding the way they seek to define the invention.

44 With the exception of claims 13 and 14, the claims dependent upon claims 1 and 15 specify various details of the method by which the experience/exploration balance is optimized, of the way data is stored so that it can be shared with another control system and the hierarchy of control functions. I can see nothing in the detail of any of these techniques that could provide a patentable advance and since they share the same shortcoming as claims 1 and 15 in being for an unspecified use, I find that they encompass excluded subject matter and are unpatentable.

45 Claims 13 and 14 require some further consideration. They read:

"13. A control system according to any preceding claim to actuate a robot" and;

"14. A control system according to any preceding claim to actuate an interface"

46 Now I have indicated above that constraining the control system to a practical application such as the control of a robot could form the basis of a patentable claim. Independent claims 20 and 32 are in my view adequately constrained in this respect and thus not excluded. It seems to me that the amendment required to turn claim 13 into a properly constrained independent claim would duplicate claim 20. Thus whilst not excluded, it would not seem appropriate to amend the application to include a claim based on claim 13 if a claim based on claim 20 is included.

47 As for claim 14, Mr Ablett and Mr Philips put it to me at the hearing that controlling an interface was a technical field and hence that claim 14 was patentable. They certainly felt it would be patentable under the "technical contribution" approach. Whilst I agree that controlling certain aspects of an interface might be patentable, I do not think the way the interface is controlled in the present application can be said to provide a technical contribution. In the greetings card embodiment, the interface is controlled to present the options most likely to be favourable to a potential customer. The interface does not solve any technical problem – the system is purely concerned with the content that is being presented, not with any technical issues such as image resolution or quality which was what made *Vicom* patentable. I can see no technical contribution or advance in a non-excluded field made by the interface in this case.

Conclusion

48 I have found that in substance claims 1 and 15 are unpatentable as they encompass excluded matter within their scope ie they seek protection for arrangements which do not make an advance in a non-excluded field. Thus the application as presently on file does not meet the requirements of section 18(3).

Amendment

49 The section 20 period as extended under rule 110(3) and (4) expired on 7 December. Under normal circumstances that would mean that any opportunity for amendment had passed. Consequently my findings above that the application on file at that date did not meet the requirements of the Act would be the end of the matter – it would be refused as not meeting the requirements of section 20.

50 At the hearing Mr Ablett made it clear that the Applicants wanted to retain the option to amend the specification to reflect the findings of my decision. Indeed, that was why they requested two extensions to the section 20 period under rule 110. However it is clear from the correspondence on file that the Applicants have been advised by the examiner that it was not necessary for them to seek further extensions to the section 20 period. This advice seems to be based upon a misconception that the section 20 period is effectively suspended once the hearing has taken place. That is incorrect and the fact that the Applicants were told this constitutes an irregularity in Office procedure. Taking into account all the information available to me I consider it right for the Comptroller's discretion to be exercised to extend the s20 period under rule 100. I

therefore extend the section 20 period by 2 months from the date of this decision to allow the Applicants the opportunity to amend the application to reflect my findings. Since this is a period specified in relation to proceedings before the Comptroller, by virtue of section 117B(5) of the Act this period cannot be extended as of right under section 117B(2).

51 In making such amendments, the Applicants will need to delete claims 1-19, to ensure that the remaining claims clearly define the invention and that it is clear from the description that the embodiments that do not relate to control of a robot do not form part of the invention. If no satisfactory amendment is filed within that period I will refuse the application under section 20(1).

Appeal

52 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

Annex A – The Independent Claims.

1. A control system to actuate an operating system to cause the operating system to perform any one of a plurality of possible actions, the method comprising:-

monitoring means for monitoring the response performance of said action as that action is performed by the operating system;

store means to contain representations of the response performance of said plurality of possible actions that have been performed by the operating system, the representations being stored according to the action performed;

assessing means for selecting a next one of the plurality of possible actions which is to be performed by the operating system by using the probability distribution of all the response performances now stored in the store means and choosing the next action on the basis that it is likely to result in the lowest expected growth in regret after that next action is performed by the operating system,

where regret is a term used for the shortfall in response performance between always performing the true best candidate action and actually performing the candidate action chosen to be next performed;

means to cause the operating system to next perform the selected next action; and

updating means to update the store means with the representation of the monitored response performance of the selected next action once the action is completed.

15. A method of providing control signals to an operating system to cause the operating system to perform any one of a plurality of possible actions, the method comprising:-

monitoring the response performance of said action as that action is performed by the operating system;

providing a store means to contain representations of the response performance of said plurality of possible actions that have been performed by the operating system, the representations being stored according to the action performed;

selecting a next one of the plurality of possible actions which is to be performed by the operating system by using the probability distribution of all the response performances now stored in the store means and choosing the next action on the basis that it is likely to result in the lowest expected growth in regret after that next action is performed by the operating system, where regret is a term used for the shortfall in response performance between always performing the true best candidate action and actually performing the candidate action chosen to be next performed;

providing a control signal to the operating system to cause the operating system to next perform the selected next action; and

updating the store means with the representation of the monitored response performance of the selected next action once the action is completed.

20. A control system to actuate an robotic operating system to cause the robotic operating system to perform any one of a plurality of possible actions, the method comprising:-

monitoring means for monitoring the response performance of said action as that action is performed by the robotic operating system;

store means to contain representations of the response performance of said plurality of possible actions that have been performed by the robotic operating system, the representations being stored according to the action performed;

assessing means for selecting a next one of the plurality of possible actions which is to be performed by the robotic operating system by using the probability distribution of all the response performances now stored in the store means and choosing the next action on the basis that it is likely to result in the lowest expected growth in regret after that next action is performed by the robotic operating system, where regret is a term used for the shortfall in response performance between always performing the true best candidate action and actually performing the candidate action chosen to be next performed;

means to cause the robotic operating system to next perform the selected next action; and

updating means to update the store means with the representation of the monitored response performance of the selected next action once the action is completed.

32. A method of providing control signals to an robotic operating system to cause the robotic operating system to perform any one of a plurality of possible actions, the method comprising:-

monitoring the response performance of said action as that action is performed by the robotic operating system;

providing a store means to contain representations of the response performance of said plurality of possible actions that have been performed by the robotic operating system, the representations being stored according to the action performed;

selecting a next one of the plurality of possible actions which is to be performed by the robotic operating system by using the probability distribution of all the response performances now stored in the store means and choosing the next action on the basis that it is likely to result in the lowest expected growth in regret after that next action is performed by the robotic operating system, where regret is a term used for the shortfall in response performance between always performing the true best candidate action and actually performing the candidate action chosen to be next performed;

providing a control signal to the robotic operating system to cause the robotic operating system to next perform the selected next action; and

updating the store means with the representation of the monitored response performance of the selected next action once the action is completed.