



BL O/085/06

24 March 2006

PATENTS ACT 1977

APPLICANT	Muchiu Chang
ISSUE	Whether patent application number GB 0307747.6 complies with Sections 1(1) and 1(2) of the Patents Act 1977
HEARING OFFICER	A C Howard

DECISION

Introduction

- 1 GB0307747.6 was filed on 3 April 2003 claiming priority from Taiwanese patent application TW91107122, which was filed on 9 April 2002. The Applicant is Dr Muchiu Chang. Initially, Dr Chang was represented by an agent, but since the issue of the first examination report, dated 11 March 2005, he has not had professional assistance.
- 2 In the first examination report the examiner objected that the invention was not patentable as a mathematical method, a mental act, a business method and a program for a computer. Furthermore an objection was raised under novelty in respect of the single document identified in the search report, namely a presentation given by S Azarm at the "Open Workshop on Decision-Based Design" in Pittsburgh, apparently on 9 September 2001, entitled "Two methods for product design selection"¹ (hereafter "*Azarm*").
- 3 In the rounds of correspondence that followed, three further examination reports were issued, but Dr Chang declined to amend his claims. This led to the offer of a hearing in the fourth examination report, dated 27 October 2005.
- 4 Dr Chang confirmed in his letter dated 2 December 2005 that he was content for the matter to be decided on the basis of the papers on file, and that is therefore what I shall proceed to do.

¹ A copy may be downloaded from http://dbd.eng.buffalo.edu/12th_meet/SAPanel.pdf

The Application

- 5 The application relates to a system and method for designing a generic product using market information as an input to the design process. The description discloses a single embodiment of modelling a computer network having client-server architecture, which network may be used for accessing multimedia data, or for on-line gaming. Claim 1 is the only independent claim and reads as follows:

An integrated virtual product or service validation and verification system and method, which comprising:

(a) a market module for acquiring market information;

(b) a product-design module for producing product design information according to said market information;

(c) a scenario module for building up at least one operational scenario according to said market information and said product design information;

(d) a modelling module for building up at least one mathematical model and computation algorithm according to said at least one operational scenario;

(e) a calculation module for performing calculation by using said at least one mathematical model and computation algorithm to obtain multiple samples of the characteristics of at least one design option;

(f) a decision-making module for making decision from said multiple samples.

- 6 The dependent claims relate to types of marketing information (claims 2-5), types of product design information (claims 6-13), a type of operational scenario (claim 14) and definitions of design option characteristics (claims 15-18). Claims 19 and 20 recite performing the decision making in a manual or computerized way respectively.

The Law

- 7 The examiner has reported that the invention claimed lacks novelty and/or inventive step and also relates to a mathematical method, a scheme, rule or method for performing a mental act, or doing business, and a program for a computer as such. These objections are based on section 1(1) and 1(2) of the Patents Act 1977 ("the Act"), the essential parts of which are shown in bold below:

Section 1(1)

A patent may be granted only for an invention in respect of which the following conditions are

satisfied, that is to say -

- (a) the invention is new;**
- (b) it involves an inventive step;**
- (c) it is capable of industrial application;**
- (d) the grant of a patent for it is not excluded by subsections (2) and (3) below;**

and references in this Act to a patentable invention shall be construed accordingly.

Section 1(2)

It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of -

- (a) a discovery, scientific theory or mathematical method;*
- (b) a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever;*
- (c) a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer;**
- (d) the presentation of information;*

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

- 8 The case law regarding the correct interpretation of s. 1(2) has developed substantially in the period since this application was filed. Two recent decisions which have been discussed with Dr Chang and which address this question are *CFPH*² and *Halliburton*³.

Discussion

- 9 For the avoidance of any doubt, I should confirm at this point that the date of publication of *Azarm* has not been called into question by the applicant. I am satisfied that the material in *Azarm* was made available to the public earlier than the priority date of the present application and is therefore validly citable as prior art against the present application.

² *CFPH LLC's Application* [2005] EWHC 1589 (Pat)

³ *Halliburton Energy Services, Inc. vs. Smith International (North Sea) Ltd. and others* [2005] EWHC 1623 (Pat)

- 10 Dr Chang's claim 1, which I have reproduced in full above, specifies a system and method comprising several *modules*, for doing the following (I paraphrase):
- (a) Acquiring the market
 - (b) Producing product design information according to the market information
 - (c) Building an operational scenario
 - (d) Building a model according to the scenario
 - (e) Calculating multiple samples using the model
 - (f) Making decisions from multiple samples
- 11 *Azarm* discloses a method of product design in which customer market information and product design attributes are used to determine the characteristics of a potential product (such as product life). In a section headed "selection with many customers", *Azarm* includes a list of seven steps comprising the following:
1. define the market
 2. sample customer preferences
 3. generate design alternatives
 4. assume a choice model and obtain demand
 5. estimate NPV [which I understand to mean "net present value"] and market share of each alternative
 6. construct designer's expected utility function
 7. select alternative with maximum designer flexibility
- 12 *Azarm* also includes a flowchart for design alternative generation and evaluation which sets out how a Monte Carlo simulation (a technique employing random sampling for simulating physical or mathematical processes) can be used to optimize a design on the basis of several variables including cost, customer preferences and market conditions.
- 13 Dr Chang has made the point that the prior art differs from the claimed invention in that the latter provides a solution for dynamic market competition. He also drew attention to the conclusion of the *Azarm* document which lists dynamic market competition under a heading of directions for further research. This latter fact was not disputed by the examiner, who however observed that "dynamic market competition" is not an essential feature of the claim language. To this, Dr Chang responded that "...this was taken for granted in this profession [*sic*] area and need not be stated explicitly". I have to say that in the absence of any independent support for this assertion, I find this line of argument difficult to accept. It is of course true that in any given field there may exist generally understood information and background knowledge that need not be recited every time. However here we are talking about the very features by which Dr Chang would have me believe the invention is distinguished over the prior art, and I would need a sound justification before being able to conclude that such matter is implicitly present as a limitation to the scope of his claim.
- 14 *Azarm* relates to steps in a method, while the claims presently under consideration comprise "modules". However I do not consider this a significant distinction. *Azarm* clearly envisages computation and this necessarily involves

provision of the means to carry out the various steps of the method.

- 15 There is an evident equivalence between steps 1-4 of *Azarm* and modules (a) to (c) in Dr Chang's claim 1. It is clear from *Azarm* that the method is to be performed by Monte Carlo simulation. Dr Chang has not tried to deny that this is a known technique in computational science. If the sample is large enough, and the underlying mathematical model is sufficiently detailed, the result of the simulation will be a good approximation to the real physical system. Accordingly I am satisfied that modules (d) to (f) are also anticipated by the method of *Azarm*, and that claim 1 is therefore anticipated by *Azarm*.
- 16 Claim 2 is anticipated by the flowchart on page 10 of *Azarm* headed "Overall Flowchart", with particular reference to the input "preferences of sample customers". Similarly claims 3-5 relate to different types of information, all of which are disclosed explicitly or implicitly in *Azarm*.
- 17 I should note here that claim 2 and subsequent claims are characterised by specifying that certain information "can" fall into specified categories. This is not an ideal way of defining claimed integers, but I have in all cases interpreted "can" to mean "is".
- 18 Claims 6-13 specify the type of product design information that may be involved. Claim 14 recites that the operational scenario "can include multiple characteristic changes of said product or service", while claims 15,17 and 18 state that the characteristics of a design option may be the function of the product or service, the life cycle overall characteristics of the product or service and the merit of the product or service respectively. These aspects are not clearly disclosed in *Azarm*, and for this reason I conclude that these claims are novel at least having regard to the cited prior art.
- 19 The examiner commented in paragraph 12 of the Official letter dated 11 March 2005 that even if the features of certain dependent claims did impart novelty, they related to no more than alternatives that the skilled person would consider. Dr Chang's response did not address this objection specifically. Having considered the differences between the subject-matter of claims 6-13 and *Azarm*, and taking into account the general nature of what is claimed, I have come to the conclusion that the types of information specified in claims 6-13 are indeed those that would be considered by a skilled person in the course of designing a product or service, and these claims are therefore lacking in inventive step.
- 20 Claims 19 and 20 specify performing the decision making step in a manual way and by computer respectively. These are totally trivial limitations. They have no bearing on the above conclusions and do not impart novelty or inventive step.
- 21 I have concluded above that the claims are bad for want of novelty and inventive step. There is however also considerable discussion on the file concerning the subject of excluded matter, and it is convenient for me now to consider this question, which is of relevance to the possibility of any amendment aimed at salvaging the application.
- 22 In *CFPH*, Deputy Judge Peter Prescott QC considered that the correct approach

to determining whether an alleged invention is excluded under section 1(2) is to apply a two step test as follows:

(1) identify what is the advance in the art that is said to be new and not obvious (and susceptible of industrial application); and

(2) determine whether it is both new and not obvious (and susceptible of industrial application) under the description of an "invention" in the sense of Article 52 of the European Patent Convention - which section 1(2) of the Act reflects.

- 23 The question of whether a claim to a method of designing an article (actually a drill bit) was excluded under s. 1(2) was considered by Pumfrey J in *Halliburton*. To quote from paragraph 215:

"I am very reluctant to examine a large number of decided cases on this question, since for my purposes I think the law is, as I have indicated, clear, albeit difficult to apply: the contribution the inventor makes must lie in a technical effect, and not merely in excluded subject matter."

- 24 He went on to apply this to the question before him in the following terms (paragraph 217):

"In the present case, claims 1 and 3 are directed purely to the intellectual content of a design process, and the criteria according to which decisions on the way to a design are made. They are not limited in terms to a computer program, although no doubt are so limited as a matter of reality. They are thus firmly within the forbidden region as schemes for performing a mental act."

- 25 I am aware that *Halliburton* is currently under appeal, but I believe it is clear from both these cases that what needs to be done is to identify the "advance" or "contribution" (I regard the terms as equivalent) and then determine whether or not it lies in an excluded field. There is further authority for this approach in the decisions of Pumfrey J in *Shopalotto*⁴ and *RIM*⁵, and Kitchin J in *Crawford*⁶. These further cases were not brought to the attention of Dr Chang by the examiner, but they do not affect my conclusions as set out below.

- 26 Dr Chang has argued that the claimed invention is "...a physical infrastructure which integrates knowledge in science and engineering with [a] computer along to provide a *a priori* assessment for the dynamical relationship between the product specification and the risks incurred from the design". There is no question that the invention uses a computer to simulate a product. However it seems to me that the emphasis is very much on commercial considerations, such as the capability of producing and servicing the product based on the specification, the risk incurred from a customer complaint, and revenue considerations. In his letter dated 7 June 2005 Dr Chang referred to the possibility of referring to physical characteristics

⁴ *Shopalotto.com Ltd's Application* [2005] EWHC 2416 (Pat)

⁵ *Research In Motion UK Ltd vs. Inpro Licensing* [2006] EWHC 70 (Pat)

⁶ *Cecil Lloyd Crawford's Application* [2005] EWHC 2417 (Pat)

such as “thermal”, “vibration” and “humidity”, but there is no support in the description for this.

- 27 Although he did not say so explicitly, I believe Dr Chang considered that the invention is patentable because it is implemented using technical means such as a computer to execute the Monte Carlo simulation. However, in accordance with both *CFPH* and *Halliburton*, something more than this is required: there must be an advance in a non-excluded field. I have already noted above that the use of computers to execute Monte Carlo simulations is known and this cannot therefore constitute an advance of any description.
- 28 Dr Chang has also argued that the invention is a generally applicable validation and verification system for a product specification. The comments of Pumfrey J in *Halliburton* are pertinent to this point. This was put to Dr Chang by the examiner in the official letter dated 27 October 2005, in which there is a lengthy quotation from Patent Office decision O/230/05, in which the Hearing Officer (Mr M Wilson) had considered these points in some detail. I shall not repeat those words, except to say that I agree with the conclusion that while a claim to a new and inventive product, or a claim to a method of manufacturing such a product, would be acceptable, a claim that stops short of this and goes no further than the method of design is not allowed.
- 29 In reality, the presently described system and method does not result in a novel product, but rather information about design options which are likely to be successful in the market place. This is the only “contribution” I can see which could be made by any claim that could feasibly be drafted on the basis of the description. Even if the claims were to be limited to the single described embodiment, it is not apparent that such a product would necessarily be improved or even novel with respect to the prior art.
- 30 It is clear to me that the described invention is intended to be implemented on a computer. This is evident from the way it employs Monte Carlo techniques, which, realistically, require the use of a computer. Dr Chang argued that “there is no single statement which may indicate that the object which I intended to be patented is related to any program for [a] computer.” However, in the light of the analysis in *Halliburton* (quoted from paragraph 217 and referenced above), I conclude that any novel or inventive claim that could be drafted, and which found support in the description, would fall foul of the exclusion by virtue of being a program for a computer and a mental act. To the extent that such a hypothetical claim might encompass a method of modelling commercial and logistical aspects of a business process, it would also be excluded as a method of doing business.

Conclusion

- 31 I have decided that the invention as claimed in claims 1-6 and 19-20 are lacking in novelty; and that the remaining claims are obvious. I have also concluded that no amendment could be offered that could overcome these deficiencies while resulting in a claim that is not excluded under section 1(2). Consequently I refuse this application under section 18(3) of the Act.

Appeal

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

A C Howard
Deputy Director acting for the Comptroller