



PATENTS ACT 1977

APPLICANT	Geodesixs Inc.
ISSUE	Whether patent application GB 1213723.8 complies with Section 1(2)(c) of the Act
HEARING OFFICER	Dr C L Davies

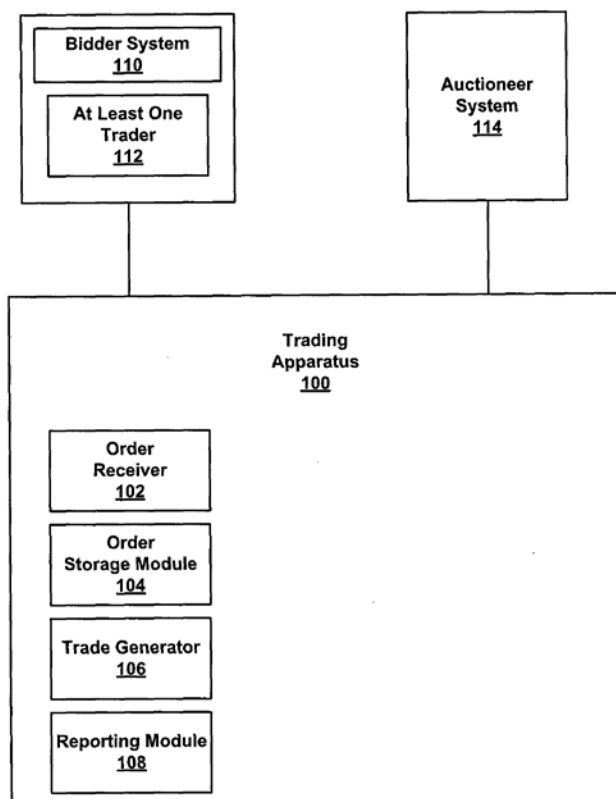
DECISION

- 1 This decision concerns whether the invention set out in patent application GB1213723.8 relates to excluded matter. The examiner has maintained throughout the examination of this application that the claimed invention is excluded from patentability under section 1(2) of the Patents Act 1977 as a method of doing business and/or a program for a computer.
- 2 Despite several rounds of argument and amendment, the applicant has not been able to overcome the objection, and a hearing was offered in order to resolve the matter. A pre-hearing report was issued by the examiner on 10th May 2017 indicating that unless a hearing was requested the issue would be decided on the basis of the papers on file. In their response of 30th May 2017 the applicant made no request for a hearing.
- 3 The matter therefore came before me for a decision on the papers.

The Application

- 4 The application is titled "A trading apparatus and method" and relates to an interactive networked computer system which enables buyers and sellers to trade assets. In general terms the trades involved may be any that involve bids or offers, such as auctions (either standard or reverse auctions), in particular forms of sealed bid or blind auctions, or by way of matching bids and offers submitted by the trading parties, e.g. as commonly practised for electronic trading of equities or financial instruments. The system is limited to trades involving multi-unit or multi-item orders rather than individual units/items.
- 5 It should be noted that *auction* and *trading* language are used interchangeably throughout the specification such that bidder/trader, bid/offer/order, auction/trade, etc., should all be interpreted similarly, and unless the context demands otherwise should be broadly construed.

- 6 Such systems are of course generally well known, especially in relation to systems for electronic trading of equities, and the main difference between this application and the prior art is the ability to submit complex orders. Such complex orders are defined in the application and relate generally to the ability to attach conditions to a bid which only become verifiable once all bids have been made. An example given is the ability to submit a bid in an auction for a house which includes the condition that the bid is conditional on a friend winning the auction for the house next door. (Note that an auction for a single house alone would not meet the multi-unit requirement.) A more routine example would be the ability to bid a certain price for a share conditional upon receiving at least a minimum number of such shares.
- 7 Figure 1A of the application provides an overview of the system in its simplest form:



- 8 Although the illustration specifies at least one trader, the invention requires multiple traders to be connected via multiple trader systems. Additionally, although shown as a separate system, the trading apparatus may be part of the auctioneer's system.

Issues to be decided

- 9 The single issue to be decided in this decision is whether or not the application is excluded from patentability by virtue of Section 1(2)(c) of the Act.
- 10 However, it is noted that the examiner has deferred full examination of the application pending the outcome of this decision. Should I find in the applicant's favour the application will need to be remitted to the examiner for completion of the examination.

The Law

- 11 The examiner's objection was based upon Section 1(2) of the Act, stating that the application is not patentable as it relates to one or more categories of excluded matter. The most relevant provisions of this section of the Act are shown in bold below:

1(2) It is hereby declared that the following (amongst other things) are not inventions for the purposes of the 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 provisions shall prevent anything from being treated as an invention for the purposes of the Act only to the extent that a patent or application for a patent relates to that thing as such.

- 12 In order to decide whether an invention relates to subject matter excluded by section 1(2), the Court of Appeal has said that the issue must be decided by answering the question of whether the invention reveals a technical contribution to the state of the art. In *Aerotel/Macrossan*¹ the Court of Appeal reviewed the case law on the interpretation of section 1(2) and approved the following four-step approach to help decide the issue:

- 1) *properly construe the claim;*
- 2) *identify the actual (or alleged) contribution;*
- 3) *ask whether it falls solely within the excluded subject matter;*
- 4) *check whether the actual or alleged contribution is actually technical in nature.*

- 13 The operation of this approach is explained at paragraphs 40-48 of the judgment. Paragraph 43 confirms that identification of the contribution is essentially a matter of determining what it is the inventor has really added to human knowledge, and involves looking at substance, not form. Paragraph 47 adds that a contribution which consists solely of excluded matter will not count as a technical contribution.
- 14 The case law in this area has been further elaborated in *Symbian*², *AT&T/CVON*³ and *HTC v Apple*⁴. In particular, *AT&T/CVON* provided five helpful signposts to apply when considering whether a computer program makes a relevant technical contribution. In *HTC v Apple*, Lewison LJ reconsidered the fourth of these signposts

¹ *Aerotel Ltd v Telco Holdings Ltd (and others) and Macrossan's Application* [2006] EWCA Civ 1371

² *Symbian Limited's Application* [2008] EWCA Civ 1066

³ *AT&T Knowledge Ventures LP and CVON Innovations Limited* [2009] EWHC 343

⁴ *HTC Europe Co Ltd v Apple Inc* [2013] EWCA Civ 451

and felt that it had been expressed too restrictively. The signposts, as modified in *HTC v Apple*, are:

i) whether the claimed technical effect has a technical effect on a process which is carried on outside the computer;

ii) whether the claimed technical effect operates at the level of the architecture of the computer; that is to say whether the effect is produced irrespective of the data being processed or the applications being run;

iii) whether the claimed technical effect results in the computer being made to operate in a new way;

iv) whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer;

v) whether the perceived problem is overcome by the claimed invention as opposed to being merely circumvented.

- 15 These signposts also come with the following caveat in the subsequent paragraph of the *AT&T/CVON* decision:

41. If there is a technical effect in this sense, it is still necessary to consider whether the claimed technical effect lies solely in excluded matter.

The claims

- 16 There are three independent claims 1, 26 and 39, which are directed respectively to a trading network, a computer readable storage medium comprising instructions for performing a method and a computer implemented method for trading, but otherwise share the same detailed requirements. As I understand it, the applicant agrees with the examiner that if claim 1 is excluded then so too are claims 26 and 39 and I only need to consider claim 1 in detail.
- 17 The applicant submitted amended claims for consideration with their response of 30th May 2017, and these are the claims being considered in this decision. The amendments made are considered minor comprising the insertion of the phrase “that is connected to said trading apparatus” after the references to the first and second trader systems respectively in the independent claims (see underlined text in Appendix 1). Although this makes this connection explicit, it was nevertheless considered to be implicit in the previous claims when properly construed. As such the scope of the claims is considered to remain unchanged from those considered previously by the examiner.
- 18 Claim 1 is reproduced in full as Appendix 1. I consider it can be summarised as follows (omitting certain of the specific generally functional detail of the components):

Claim 1. A trading network supporting orders from either multi-unit/multi-item orders, ...

the network comprising multiple trader systems and a trading apparatus;

the trading apparatus having a trading mechanism comprising a clearing method capable of matching multiple traders in one clearing and comprising a message space that defines admissible orders:

a first trader system of said multiple trader systems, that is connected to said trading apparatus and that receives admissible orders ... said admissible orders comprising at least one admissible submitted complex order ...

...

wherein a given order is complex if it comprises at least one complex condition defined on at least one of at least two possible states of the world at a clearing;

a second trader system of said multiple trader systems, that is connected to said trading apparatus and that receives admissible orders ...

said trading apparatus comprising:

a) an order receiver, that receives admissible orders from said multiple trader systems;

b) an order storage module at said trading apparatus that stores said admissible submitted orders;

c) a trade generator at said trading apparatus that generates trades based on said admissible submitted orders and said trading mechanism,

d) a reporting module at said trading apparatus that reports said trades.

New arrangement of hardware

19 Before considering claim 1 and the *Aerotel/Macrossan* test any further, I consider it appropriate at this stage to look at the applicant's main argument.

20 The applicant seeks to rely simply on the fact that their invention results in a new arrangement of hardware. This was the basis on which the Court of Appeal found *Aerotel's* patent to be allowable. At paragraph 53 of the decision Jacob LJ said:

"53. The important point to note is that the system as a whole is new. And it is new in itself, not merely because it is to be used for the business of selling phone calls. So, moving on to step two, the contribution is a new system. It is true that it could be implemented using conventional computers, but the key to it is a new physical combination of hardware. It seems to us clear that there is here more than just a method of doing business as such. That answers the third step. Finally the system is clearly technical in nature. We see no Art. 52(2) objection to the claim."

21 That paragraph is considered to define the legal principle that should be followed. In particular it indicates that the system must be new in itself and not just on the basis of the business it is used for.

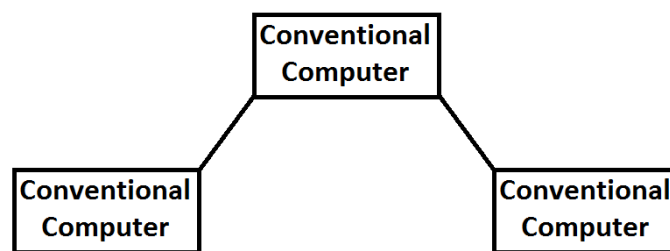
- 22 However, in their arguments, the agent has sought to compare their invention with the invention of Aerotel based on the corresponding facts.
- 23 Such comparisons must be treated with caution, as Birss J stated in *Lantana v Comptroller*⁵:

“simply because it is possible to construct a generalised category which includes both the claimed invention [...] and a previous decision in which a claim was held to be patentable, does not help. It shows that such things can be patentable in some cases but does not show that the invention in this case is patentable”

- 24 Similarly in *RIM UK Ltd v Inpro*⁶, although this predates the Aerotel test, when considering the S.1(2) exclusions Pumfrey J said:

“The test is a case-by-case test, and little or no benefit is to be gained by drawing analogies with other cases decided on different facts in relation to different inventions.”

- 25 Furthermore, the *Aerotel* patent was subsequently revoked following the High Court decision in *Aerotel v Wavecrest*⁷ and it must be emphasised that these cases were decided on different facts, new evidence being available in the later case regarding the prior art.
- 26 In his examination report of 13th April 2017, in response to the applicant’s argument that their invention provided a new arrangement of hardware, the examiner illustrates the applicant’s invention as being implemented by three conventional computers connected together (reproduced below) and observes that such an arrangement of hardware is not new and therefore does not provide a technical contribution.



- 27 In their response of 25th April 2017 the applicant responded by saying that this similarly illustrates the Aerotel system, and applying this approach would have led the examiner to find the Aerotel patent excluded, contrary to the decision of the Court of Appeal in *Aerotel*. Nevertheless, that the patent was excluded is exactly what the High Court found in relation to the Aerotel patent in *Wavecrest*.
- 28 If nothing else, this highlights the dangers of trying to compare an application with decisions based on the facts. They must be assessed on a case by case basis. It

⁵ *Lantana v Comptroller-General of Patents* [2013] EWHC 2673 (Pat)

⁶ *Research In Motion UK Ltd v Inpro Licensing SARL* [2006] EWHC 70 (Pat)

⁷ *Aerotel Ltd v Wavecrest Group Enterprises Ltd & Ors* [2008] EWHC 1180 (Pat)

shows that applications, indeed even the same application, can be patentable based on one set of facts but unpatentable based on a different set of facts.

- 29 Furthermore, trying to distinguish from the facts of *Wavecrest* seems particular unhelpful given that the patent in issue in that case dated from 1985, when interactive systems based on networked computers were far less well known than they are now. Additionally, the applicant's argument seems to be based in part on comments the judge made in parentheses "*(and consisting of conventional computers programmed to carry out some (but not all) of the tasks required of a Special Exchange)*" which I do not consider should attract the kind of weight the applicant would wish me to place on them. In any event, just because the applicant is able to find some difference between the system of their application and the facts upon which *Wavecrest* was decided does not mean their application is allowable.
- 30 The examiner also referred in his pre-hearing report to the findings of the hearing officer in *Validsoft*⁸, in which the hearing officer compared the decisions in *Aerotel* and *Wavecrest*. It seems appropriate to quote the following warning from the hearing officer (paragraph 19):

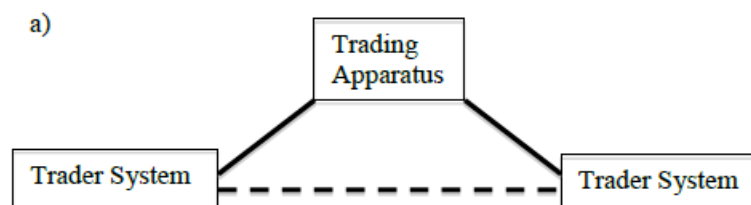
"Hence I think great care is needed in looking to draw too much from what the Court of Appeal found in Aerotel in relation to the facts of that case and based on information they had at the time".

- 31 The hearing officer went on to say:

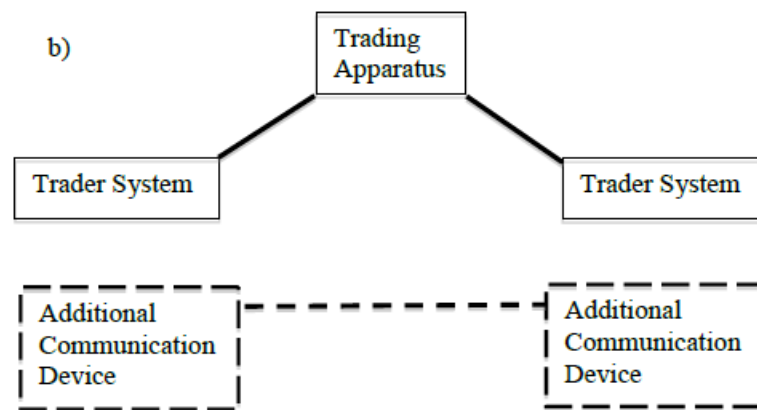
"Where an inventor believes he has invented a new arrangement of hardware, particularly where that hardware involves one or more networked computers then he should make clear what he considers to be that new arrangement."

- 32 This brings me on to the next strand of the applicant's arguments regarding how the hardware of their system differs from known arrangements.

- 33 In their 30th May response, the applicant suggests that prior art systems all required an additional direct link between the systems of the separate traders as illustrated below (the dashed line showing the additional direct links provided either through a connection between the trader's systems (a) or by means of an additional communication device (b)):



⁸ *Validsoft UK Limited's Application* BL O/291/16



- 34 They go on to say that in contrast to these arrangements, the architecture of the claimed network does not require the extra/additional communication lines.
- 35 This seems to give rise to a number of questions. Firstly, it is not clear that the arrangements illustrated above would not work, or that there is anything in claim 1 which restricts the arrangement to one in which there is no additional communication line. I.e. there is nothing to suggest that the invention could not be implemented using one of the known arrangements. Secondly, it is not clear that the arrangement without the additional communication lines is a new arrangement of hardware.
- 36 In relation to the first point, and having in mind the comments of the hearing officer in *Validsoft*, there does not appear to be anything in the application description which identifies that the lack of additional communication lines is important, or even that this is how the arrangement illustrated differs from prior arrangements. Furthermore, there is no disclaimer to suggest arrangements having the additional communication line are outside the scope of protection.
- 37 As for the second point, arrangements lacking the additional communication line are considered to be known. In particular, it is commonplace for interactive communications between participants in an online setting to be handled by the server rather than on a peer to peer basis. Even more so in relation to financial trading and/or auction sites where the timing and order that bids are received by the server may be of paramount importance. Furthermore, the evidence of the documents identified in the international search report (published as WO 2011/094235 A3 on 29 December 2011) would indicate that arrangements lacking the additional communication lines are known, and particular attention is drawn to the system of figure 1 of US 2009/292637 A1.
- 38 In summary, I do not consider it helpful to compare the system of the current application with the system considered in *Aerotel* or *Wavecrest*. I also do not agree that the architecture of the claimed network differs from known arrangements in the manner suggested by the applicant. For at least these reasons I do not agree with the arguments put forward by the applicant that the invention comprises a new arrangement of hardware, and it is not removed from the exclusions on this basis.

39 I shall instead consider whether or not the invention is excluded on the basis of the four point test set out in *Aerotel*.

Application of *Aerotel/Macrossan* test

40 It is noted that in all their most recent responses (7th April, 25th April & 30th May) the applicant has not sought to rely on the *Aerotel/Macrossan* test beyond suggesting that claim 1 when properly construed defines a new arrangement of hardware and that it is allowable on that basis.

41 The applicant has not therefore in any of their recent correspondence made any suggestions regarding how the test should be applied, and in particular the nature of the contribution (beyond it being a new arrangement of hardware).

42 Nevertheless, in order to decide the issue I must apply the test. In doing so I have taken account of the applicants arguments presented in their earlier responses (27th June 2016 & 12th December 2016).

Step 1 - Properly construe the claim

43 In order to properly construe claim 1 it is first worth noting how some of the terms used in the claims are defined in the description, but the claim may otherwise be construed as read. The following definitions are therefore noted:

Admissible orders - the kind of valid orders/bids that users may submit in the auction.

Clearing method - Clearing refers to the process of matching bids with items being traded at the close of the auction/trading period. It comprises an algorithm used to establish the results of trades, and includes a trading format, tie-breaking rules and other rules, e.g. reserve prices, that may be necessary.

Message space - constitutes a number of limitations that defines admissible orders.

Objective function - an over-riding objective to be achieved as set by the auctioneer for determining which trades are executed. For example, the objective may be to maximise revenue or it may be to maximise trade volume.

State of the world - one of a set of potential outcomes of an event/situation. For example someone who is looking into the future may think there are two possible states of the world tomorrow: that it rains, and that it does not rain.

Trading mechanism - a mechanism employed to generate trades based on a set of orders and includes a clearing method as well as other trading rules.

44 In terms of hardware, the trading network of claim 1 requires only multiple trader systems connected to a trading apparatus. It additionally specifies that the trading apparatus comprises a trading mechanism, an order receiver, an order storage module, a trade generator and a reporting module. The trading mechanism comprises a clearing method and a message space that defines admissible orders.

- 45 The majority of the remaining detail of the claim relates to features of the admissible orders and the trade generator. Admissible orders include complex orders comprising a complex condition as further defined in the claim. The trade generator determines which trades are completed by, in particular, analysing the complex orders which are valid for each potential state of the world and selecting for completion those complex orders (and other non-complex valid orders) which result in a state of the world which satisfies some objective function.
- 46 In general the complex conditions relate to information that is not known to a bidder until the auction is complete. A condition is defined as complex in the claim if it cannot be determined based on information in one specified group (which would generally be information either known to the trader/bidder at the time of bidding, such as the traders own bidding history, or otherwise public information, such as an overview of trade history) but can be determined based on the complete information available at clearing. For the purpose of construing the claim for determining the contribution I do not consider it necessary to consider in detail the definition of a complex order/condition.

Step 2 - Identify the actual (or alleged) contribution

- 47 As I understand it the important parts of the application which distinguish it from the prior art are the provision of complex orders and the method of clearing those orders by analysing the effects of potential states of the world at completion upon those orders and selecting which orders to complete based on a corresponding objective function. These aspects are considered to form the basis of the contribution.
- 48 The contribution is considered to be:

A computer system for receiving admissible orders from multiple traders via a network, the admissible orders including complex orders having a complex condition based on information which is unknown to the trader but is determined upon completion of trades, and wherein the trade generator analyses potential trades based on orders which are valid for different potential states of the world according to the clearing method and selects for completion those orders which result in a state of the world that satisfies an objective function.

Step 3 – Ask whether the actual or alleged contribution falls solely within the excluded subject matter

- 49 Having identified the contribution I must consider whether or not it falls solely within excluded subject matter.
- 50 The contribution is considered to define a computer implemented business method that comprises a computer program which carries out the administrative task of receiving, managing, recording, and completing trades using an algorithm and predefined rules. In particular, the computer program provides additional functionality by providing the capability to accept, process and complete complex orders. Such functionality is that of a business method as it relates to the buying and/or selling of assets. The fact that traders may place new types of order and the consequential benefits in terms of price achieved and/or market liquidity, and/or the possibility for

traders to adopt new trading strategies all relate to trading activity. The fact that *technical* economic terminology can be used to describe such benefits does not confer the necessary technical effect to take the contribution outside the scope of the exclusions. Similarly, the ability for traders to coordinate trades or to adapt trades to different possible future states of the world are considered to be nothing more than financial business decisions that confer no relevant technical effect to the contribution.

- 51 The fact that a computer program is used to implement a business method does not necessarily confer patentability as noted by Birss HHJ in *Halliburton*⁹:

“35. The business method cases can be tricky to analyse by just asking whether the invention has a technical effect or makes a technical contribution. The reason is that computers are self evidently technical in nature. Thus when a business method is implemented on a computer, the patentee has a rich vein of arguments to deploy in seeking to contend that his invention gives rise to a technical effect or makes a technical contribution. For example the computer is said to be a faster, more efficient computerized book keeper than before and surely, says the patentee, that is a technical effect or technical advance. And so it is, in a way, but the law has resolutely sought to hold the line at excluding such things from patents. That means that some apparently technical effects do not always count. So a computer programmed to be a better computer is patentable (Symbian) but as Fox LJ pointed out in relation to the business method exclusion in Merrill Lynch, the fact that the method of doing business may be an improvement on previous methods is immaterial because the business method exclusion is generic.”

- 52 So in this case, the fact that it is implemented on a computer does not necessarily save it from the exclusions.
- 53 The fact that the invention is effected in software does not mean that it should be immediately excluded as a computer program as such. What matters is whether or not the program provides a *technical contribution* which takes it outside the scope of the exclusions.
- 54 In deciding whether or not the program provides such a technical contribution it is appropriate to consider the *AT&T/CVON* signposts (as updated in *HTC v Apple*).
- 55 In relation to signpost (i) although there is an effect outside the computer in terms of the execution of trades, this effect also lies in an excluded field and does not comprise the required technical effect.
- 56 There is nothing in the specification to suggest that the computers involved are running in a different or new way, or that there is an effect at the level of the architecture of the computer. The program defined in the application is clearly restricted in its operation to dealing with trade data and does not have any wider applicability. I therefore see nothing to suggest that signposts (ii) or (iii) are satisfied.

⁹ *Halliburton Energy Services Inc's Applications* [2011] EWHC 2508 (Pat)

- 57 The applicant has previously argued that a computer running the program operates more efficiently and effectively as a computer. As I understand it the argument is that unless the system is implemented according to the invention it can be too burdensome and time consuming for the computer to complete the trades in the timescales required. However, I do not consider that the computer itself functions any more efficiently or effectively. The invention does not seek to address the operation of the computer at a technical level, i.e. how the computer works as a computer. Instead the proposed invention seeks to provide an improved method for processing trades. I consider it clear that any improvements to the efficiency of the computer when processing the trades is a result only of the specific steps of the business method, rather than the solving of any technical problem with how the computer works as a computer. As such I see no technical effect in how the computer works on any technical level. Accordingly signpost (iv) is also answered in the negative.
- 58 In relation to the fifth signpost, whilst the application is clearly directed towards solving a problem regarding the ability to make complex orders, this problem lies entirely in the excluded business method field. If the problem is a technical one, the alleged invention may be considered to have a technical nature if it solves the problem. However I do not consider the problem to be technical problem and as such the fifth signpost does not assist.
- 59 In any event, it seems that whatever improvements the computer program provides, they lie in the business method field and are thus excluded.
- 60 I therefore consider that the contribution falls entirely within excluded subject matter as both a computer program and a method for doing business.

Step 4 – Check whether the actual or alleged contribution is actually technical in nature

- 61 Having considered this in detail at step three I do not need to reconsider it here. Nevertheless, it is clear to me that the contribution is not technical.

Decision

- 62 The invention defined in claim 1 is therefore excluded from patentability as it relates to a method of doing business and a computer program, as such. As stated above the same reasoning can be used to demonstrate that the proposed invention defined in claims 26 and 39 are similarly excluded from patentability.
- 63 I have not been able to find anything in the dependent claims or the description as a whole which would provide a contribution beyond a method of doing business and/or a computer program as such. I therefore refuse this application under section 18(3).

Appeal

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

C L DAVIES
Deputy Director, acting for the Comptroller

Appendix 1

Note: Underlining represents amendments made to claim 1 in the applicant's 30th May response.

Claim 1. A trading network supporting orders from either multi-unit order, multi-item orders, or a combination of multi-unit orders and multi-item orders, the network comprising multiple trader systems and a trading apparatus; the trading apparatus having a trading mechanism comprising a clearing method capable of matching multiple traders in one clearing and comprising a message space that defines admissible orders:

a first trader system of said multiple trader systems, that is connected to said trading apparatus and that receives admissible orders from at least one trader *i*, said admissible orders comprising at least one admissible submitted complex order submitted by said trader *i*,

- 1) said admissible submitted complex order involving at least one nonzero price and belonging to the group of either multi-unit orders, multi-item orders, or a combination of multi-unit orders and multi-item orders;
- 2) wherein a given order is complex if it comprises at least one complex condition defined on at least one of at least two possible states of the world at a clearing;

wherein, given said trading mechanism, a condition is complex if:

- 3) for at least one set of orders in the set of admissible orders from traders other than trader *i*, whether said condition, comprised in an order submitted by said trader *i*, is met cannot be determined given only the information contained in the group of

trader *i*'s allocation and transfers in said clearing,
trader *i*'s own order history up until the time of said clearing,
the history of trades up until the time of said clearing excluding information about the trade allocation and transfers in said clearing,
the history of intra-trade information available to said at least one trader *i* in said trading mechanism up until the time of said clearing excluding information about the trade allocation and transfers in said clearing,
the time of said clearing, and
the history of exogenous variables to the trading mechanism up until the time of said clearing,

but can be determined given the information contained in the group of the trade allocation and transfers in said clearing, and the entirety of trading mechanism information up until the time of said clearing;

a second trader system of said multiple trader systems, that is connected to said trading apparatus and that receives admissible orders from at least one trader other than trader i

and said trading apparatus comprising:

a) an order receiver, that receives admissible orders from said multiple trader systems;

b) an order storage module at said trading apparatus that stores said admissible submitted orders;

c) a trade generator at said trading apparatus that generates trades based on said admissible submitted orders and a said trading mechanism,

wherein a price or prices corresponding to a generated trade allocation and transfers, for item or items on which said at least one admissible submitted complex order was submitted, are determined endogenously;

wherein the trade generation involves using said clearing method to select a trade that is associated with at least one of said at least two possible states of the world at the clearing;

wherein the trade selection involves using an objective function that is part of the clearing method;

wherein a trade that is associated with a possible state of the world at the clearing is solved-for based on the set of orders that are valid conditional on that associated possible state of the world,

wherein the set of valid orders conditional on a state of the world is a subset of the set of valid orders, wherein any complex orders within said set of valid orders is valid for only the at least one possible states of the world on which it is defined, and any orders without conditions within the set of valid orders are valid for any state of the world; and

d) a reporting module at said trading apparatus that reports said trades.