

[2021] EWHC 78 (Ch)

Appeal Number: CH-2020-000142

IN THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND & WALES
CHANCERY APPEALS

Royal Courts of Justice, Rolls Building
Fetter Lane, London, EC4A 1NL
22 January 2021

Before
MR DANIEL ALEXANDER QC
(Sitting as a Deputy Judge of the Chancery Division)

B E T W E E N:
MR COREY KAIZEN REAUX-SAVONTE

Appellant

- and -

COMPTROLLER-GENERAL OF PATENTS, DESIGNS AND TRADE MARKS

Respondent

The appellant appeared in person
Dr Stuart Baran instructed by the Treasury Solicitor appeared for the Respondent

Hearing date 2 December 2020

JUDGMENT

Covid-19 Protocol: This judgment was handed down by the judge remotely by circulation to the parties' representatives by email and release to BAILII. The date and time for hand-down is deemed to be 10:30 on 22 January 2021.

DANIEL ALEXANDER QC

INTRODUCTION

1. This is an appeal from the Decision of Mr Huw Jones (Deputy Director UKIPO) acting for the Comptroller General, dated 19 May 2020 in which he held that patent application GB1520019.9 (“the application”) should be refused because the alleged invention consisted of subject matter excluded from patentability by s.1(2) of the Patents Act 1977 (“the Act”).
2. The application relates to a structured array of data that is said to enable the evolution of artificial intelligence (AI). It was filed on 13 November 2015 and a request for search was filed on 14 November 2016. The examiner was of the view at this early stage that the application provided very little specific technical detail upon which to base a search and invited the applicant to withdraw the application and to request a refund of the search fee. The applicant declined to do so and instead filed an amended set of claims that altered little as far as the examiner was concerned.
3. The examiner then issued a report under section 17(5)(b) stating that a search would not serve a useful purpose, citing a lack of technical detail in the application and the view, based on what could be gleaned from the description, that the invention was nothing more than data structured in a modular, hierarchical and self-contained manner, which fell to be excluded under section 1(2)(c) as a program for a computer. The applicant disagreed with the examiner’s objections and requested a hearing which took place via Skype conference on 30 April 2020 leading to the decision rejecting the application. The consequence is that there has been no search for prior art and this appeal must be evaluated with that in mind.
4. Although it has several aspects, the appellant applicant’s central contention on this appeal is that the hearing officer applied the law relating to the exclusion from patentability in an overly restrictive manner.

LAW

Substantive law relating to s.1(2) of the Act

5. On the appeal, there was no dispute as to the relevant law. It was recently summarised by Birss J in *Lenovo (Lenovo (Singapore) PTE Ltd v. Comptroller-General* [2020] EWHC 1706 (Pat)) as follows and was referred to by the hearing officer as follows:

“8...the leading cases governing the application of s1(2) are two decisions of the Court of Appeal. First *Aerotel Ltd v Telco Holdings Ltd & Ors Rev 1* [2007] RPC 7 and then *Symbian Ltd v Comptroller General of Patents* [2009] RPC 1. *Aerotel* sets out a four step test to be applied, which, as the Deputy Director put it in paragraph 9, *Symbian* explains was not intended to be a new departure in domestic law. The four steps are:

- (1) Properly construe the claim;
- (2) identify the actual 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.

9. *Symbian* also explained that although in methodological terms the approach in the UK and the approach in the EPO may look different, in practice they reach the same result, at least usually. I mention this because it has been a feature of some of these appeals in the past to argue that the UK approach was out of step with the approach in the EPO. Mr Wood made clear that he was not making that submission. The appellant's case takes the UK law as it stands. The submission is that the error was in the application of that UK law to the facts of this case.

10. Also relevant are the signposts identified by Lewison J in *AT&T Knowledge Ventures/CVON Innovations v Comptroller General of Patents* [2009] EWHC 343 (Pat) and reformulated in *HTC v Apple* [2013] EWCA 451 as follows:

- 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 merely being circumvented.”

6. As Lewison LJ made clear, these are not intended to be prescriptive (*HTC v Apple* at [149]). I also bear in mind the following observations of Kitchin LJ, as he then was, in *HTC*:

“45. How then is it to be determined whether an invention has made a technical contribution to the art? A number of points emerge from the decision in *Symbian* and the earlier authorities to which it refers. First, it is not possible to define a clear rule to determine whether or not a program is excluded, and each case must be determined on its own facts bearing in mind the guidance given by the Court of Appeal in *Merrill Lynch* and *Gale* and by the Boards of Appeal in Case T 0208/84 *Vicom Systems Inc* [1987] OJ EPO 14, [1987] 2 EPOR 74, Case T 06/83 *IBM Corporation/Data processing network* [1990] OJ EPO 5, [1990] EPOR 91 and Case T 115/85 *IBM Corporation/Computer-related invention* [1990] EPOR 107.

46. Second, the fact that improvements are made to the software programmed into the computer rather than hardware forming part of the computer does not make a difference. As I have said, the analysis must be carried out as a matter of substance not form.

47. Third, the exclusions operate cumulatively. So, for example, the invention in *Gale* related to a new way of calculating a square root of a number with the aid of a computer and Mr Gale sought to claim it as a ROM in which his

program was stored. This was not permissible. The incorporation of the program in a ROM did not alter its nature: it was still a computer program (excluded matter) incorporating a mathematical method (also excluded matter). So also the invention in *Macrossan* related to a way of making company formation documents and Mr Macrossan sought to claim it as a method using a data processing system. This was not permissible either: it was a computer program (excluded matter) for carrying out a method for doing business (also excluded matter).

48. Fourth, it follows that it is helpful to ask: what does the invention contribute to the art as a matter of practical reality over and above the fact that it relates to a program for a computer? If the only contribution lies in excluded matter then it is not patentable.

49. Fifth, and conversely, it is also helpful to consider whether the invention may be regarded as solving a problem which is essentially technical, and that is so whether that problem lies inside or outside the computer. An invention which solves a technical problem within the computer will have a relevant technical effect in that it will make the computer, as a computer, an improved device, for example by increasing its speed. An invention which solves a technical problem outside the computer will also have a relevant technical effect, for example by controlling an improved technical process. In either case it will not be excluded by Art 52 as relating to a computer program as such.”

7. The passage from the Court of Appeal in *HTC* reflects the importance of focussing on what the invention contributes to the art over and above the fact that it relates to a program for a computer and to do so on the basis of substance not form. That is further reinforced by the judgment of Jacob LJ in *Aerotel* at [42]-[46] where the court emphasised the need to identify the alleged contribution or what the inventor says that his or her contribution was:

“43. The second step—identify the contribution—is said to be more problematical. How do you assess the contribution? Mr Birss submits the test is workable—it is an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are. What has the inventor really added to human knowledge perhaps best sums up the exercise. The formulation involves looking at substance not form—which is surely what the legislator intended”.

44. Mr Birss added the words “or alleged contribution” in his formulation of the second step. That will do at the application stage—where the Office must generally perforce accept what the inventor says is his contribution. It cannot actually be conclusive, however. If an inventor claims a computer when programmed with his new program, it will not assist him if he alleges wrongly that he has invented the computer itself, even if he specifies all the detailed elements of a computer in his claim. In the end the test must be what contribution has actually been made, not what the inventor says he has made.”

Identification of alleged contribution

8. Evaluation of the alleged contribution is not always straightforward in cases under section 1(2). It can be made harder by the fact that the application and the claims submitted may not make it clear what that alleged contribution is said to be, let alone what any actual contribution is. In cases where it is not possible to be confident that the wording and structure of the claims adequately capture the substance of the invention for the purpose of determining whether it complies with the statutory requirements, it is justifiable for the analysis to focus to a greater extent on the specification as a whole. In cases where the text of the specification is itself obscure, the Comptroller submits, and the appellant does not disagree, that it may be appropriate in certain cases to take into account how the applicant/inventor itself characterises the key features of the invention, in so far as that is consistent with what is said in the document itself.
9. That may be more justifiable where, as in the present case, a patent application has been drafted without specialist professional assistance and is not a clear document. However, such an approach needs to be applied with caution and cannot be conclusive. The manner in which an applicant describes the invention separately from the application should not displace or distort what is stated in the application about the invention. In the case of evaluation of a section 1(2) objection before grant, the application, not what the applicant says about it, must remain the primary point of reference for application of the statutory test.
10. The decision rejected the application only on the basis that the invention relates to a computer program as such. As Birss J noted in *Re Halliburton Energy Services Inc* [2011] EWHC 2508 (Pat) at [34]: “The cases in which patents have been refused almost always involve the interplay between at least two exclusions. A notable exception is the outcome of *Fujitsu*. However, the Court of Appeal in *Symbian* drew attention to that case as having an arguably inconsistent result.” That does not mean that such kinds of objection are impermissible, as *Fujitsu* illustrates. The appellant has not argued that it does. However, I approach a case in which the sole objection to the application proceeding to further examination is that it is excluded by the computer program exception with appropriate care.

Approach to appeal

11. First, in *Lenovo*, Birss J recorded that the approach set out in *Actavis Group PTC EHF v. ICOS Corp* [2019] UKSC 15, [2020] All ER 213 at [79]-[81] was agreed to be applicable to the appeal in that case. In *Actavis*, Lord Hodge said (omitting citations):

“79. An experienced patent judge faced with a challenge to a patent on the ground of obviousness, and who has heard oral evidence including cross examination, carries out an evaluation of all the relevant factors, none of which alone is decisive but each of which must be weighed in the balance in reaching a conclusion. In *Biogen Inc v Medeva plc* [1997] RPC 1, 45, Lord Hoffmann emphasised the need for appellate caution in reversing the judge's evaluation of the facts where the application of a legal standard involved no question of principle but was simply a matter of degree. He held that it would be wrong to interfere with the judge's assessment if no question of principle were involved.

80. What is a question of principle in this context? An error of principle is not confined to an error as to the law but extends to certain types of error in the

application of a legal standard to the facts in an evaluation of those facts. What is the nature of such an evaluative error? In this case we are not concerned with any challenge to the trial judge's conclusions of primary fact but with the correctness of the judge's evaluation of the facts which he has found, in which he weighs a number of different factors against each other. This evaluative process is often a matter of degree upon which different judges can legitimately differ and an appellate court ought not to interfere unless it is satisfied that the judge's conclusion is outside the bounds within which reasonable disagreement is possible....

81. Thus, in the absence of a legal error by the trial judge, which might be asking the wrong question, failing to take account of relevant matters, or taking into account irrelevant matters, the Court of Appeal would be justified in differing from a trial judge's assessment of obviousness if the appellate court were to reach the view that the judge's conclusion was outside the bounds within which reasonable disagreement is possible. It must be satisfied that the trial judge was wrong..."

12. The Comptroller submitted that it is applicable here. The appellant did not suggest otherwise.
13. I also bear in mind the passages from the leading judgment in the Supreme Court in *Designers Guild* [2000] 1 WLR 2416, 2423-2424 ("...because the decision involves the application of a not altogether precise legal standard to a combination of features of varying importance, I think that this falls within the class of case in which an appellate court should not reverse a judge's decision unless he has erred in principle") and in *AH (Sudan) v Secretary of State for the Home Department* [2007] UKHL 49, [2008] 1 AC 678 at [30] (decisions of specialist tribunals merit respect unless "it is quite clear that they have misdirected themselves in law." and appellate courts "should not rush to find such misdirections simply because they might have reached a different conclusion on the facts or expressed themselves differently. ... ")
14. The hearing officer, not this court, is the primary evaluator of whether the statutory test has been fulfilled. This court cannot overturn such a determination unless there has been an error of law or the evaluation is sufficiently clearly erroneous. This court must ask, having analysed the points made on appeal, whether it is in a better position correctly to apply the statutory test to this application than the hearing officer was and only to interfere with the decision if it is sufficiently clear that it is.

THE DECISION

15. The substantive parts of the decision merit setting out in full since they are brief.

The invention and the claims

16. The hearing officer summarised the invention and identified the relevant claims for analysis as follows:

"4. The invention is described as follows. For the complexities of AI to evolve without human intervention, the structure of the AI must be designed in a way that allows the AI to pass on who it is and/or what it knows with as much ease as possible, using a "genome" that contains the genetic information of the AI.

For the AI genome to be used in machines, three components are required: the genome itself, structured similar in nature to the structure of a human genome; the "Artificial Intelligence Genome Organizer", containing information about the genome; and "Artificial Intelligence Genome Controller", a program used for the automation of genome activity. Much like the human genome, the AI genome (AIG) structure contains parts within parts, for as many levels as is necessary, required and/or wanted. The AI genome is structured in a similar manner to the human genome, with Raw Data being equivalent to DNA, Segments being equivalent to genes, Code Blocks being equivalent to chromosomes and the Core being equivalent to the complete genome.

5. The application has four independent claims (1, 9, 17 and 20) filed on 28 December 2016, which read as follows:

1. An Artificial Intelligence Genome (AIG), wherein a modular, hierarchical structure of self-contained data within a system and/or machine contains and is used to give the AI in which it inhabits traits and/or abilities, without having direct control over the actions or operations of the AI but while being able to influence, in part or in full, one or more of the traits, abilities and/or functions of the AI.

9. An Artificial Intelligence Genome Organiser (AIGO), wherein a list of data pertaining to the design and genetic information of an Artificial Intelligence Genome (AIG) contains at least one or more of the following, including but not limited to: structural information; identifying information; traits and/or abilities.

17. An Artificial Intelligence Genome Controller (AIGC), wherein a program comprising one or more of the following: abilities and permissions to create and/or handle an Artificial Intelligence Genome (AIG); and abilities and permissions to create and/or handle an Artificial Intelligence Genome Organiser (AIGO); controls the automation of functions and tasks of or involving an AIG.

20. A computer implemented method, wherein an AI is able to evolve without human intervention through the use of an Artificial Intelligence Genome (AIG), an Artificial Intelligence Genome Organizer (AIGO) and an Artificial Intelligence Genome Controller (AIGC), the method comprising: storing traits and/or abilities within an AIG; storing genetic information about the genome within an AIGO; and using an AIGC to control and manipulate an AIG based on the genetic information of an AIGO.”

17. Subject to the points discussed below, this summary of the invention and the key claims was not criticised on this appeal.

The hearing officer's evaluation

18. The hearing officer then set out the law and made his evaluation in a section entitled “*Arguments and Analysis*” as follows:

“11. The first two steps in assessing whether a computer-implemented invention such as the one described in the application is patentable involve

construing the claims and identifying the contribution made by the invention. The first step of construing the claims presented the examiner with some difficulty due to the lack of technical detail in the description. She eventually concluded that it was simply a particular way of structuring and organising data. Mr Reaux-Savonte assesses the contribution differently: he says that it is the creation of a functioning artificial genome, which allows for the production, reproduction, and evolution of artificial organisms, both digital and physical. It seems to me that there is very little difference in substance between these two positions, with Mr Reaux-Savonte's explanation of the contribution being set in the context of its eventual use and benefits, namely the production and evolution of future AI code. Having considered the application as a whole, I assess the contribution to be a particular way of structuring and organising data that may allow for the production and evolution of future AI code.

12 The next step is to determine whether the contribution is technical. The examiner has assessed the contribution with respect to each of the AT&T signposts and concluded that it is not technical. Mr Reaux-Savonte disagrees. I shall deal with each signpost in turn.

13 The first signpost suggests that a technical contribution can be found when the computer-implemented invention has an effect outside the computer. The examiner argues that the ordering and structuring of data does not have an external effect outside of the computer, while Mr Reaux-Savonte suggests that the invention enables the healing and reproduction of AI genomes in an analogous way to biological genes in nature, thereby allowing the creation of physical systems outside a computer. The application does not describe in any detail how the way of structuring and organising data leads directly to the creation of physical systems outside a computer, it merely suggests that replicating the structure of computer code in the same way that the building blocks of biological life are understood to be organised should lead to the same results in computer systems as observed in nature. It seems to me that the effect described by Mr Reaux-Savonte is purely theoretical and it is not the direct external effect envisaged by the first signpost.

14 The second signpost points to a technical effect when the contribution is made at the level of architecture of the computer or where the effect is produced irrespective of the data being processed or the applications being run. There was some discussion of this at the hearing, with Mr Reaux-Savonte rightly saying that this signpost relates to inventions in the operating system of a computer and also within the firmware of system components. Mr Reaux-Savonte says that the invention defines what type of system an artificial organism is, what it looks like, and what it is able to do; in other words, it can define the digital and physical architecture of an artificial organism. The examiner says that the invention is intrinsically related to the data being processed, i.e. the AI code. I agree with the examiner: the organisation and structuring of AI code does not operate at the architecture level, so no technical effect can be found here.

15 The third signpost suggests that a technical effect can be found when the invention results in the computer being made to operate in a new way. Mr Reaux-Savonte says that no computer has ever been defined, built, or operated based on an artificial genome before, nor has one ever reproduced or evolved. However, a computer system operating on new code does not imply that the

system works in any way differently to how it would with the old code. I have been unable to find anything in the application that suggests that a computer system is being made to operate in a new way.

16 Mr Reaux-Savonte accepts that the fourth signpost is not relevant to his invention. His argument in relation to the fifth signpost (where technical problems are solved by technical solutions as opposed to being circumvented by non-technical workarounds), is that the problem of the impossibility of evolutionary artificial organisms is overcome simply by making it possible. I agree with the examiner that it is not clear how this is achieved, and there is no evidence that this problem, or indeed any other technical problem for that matter, has actually been overcome using the system described in the application.”

GROUND OF APPEAL

19. The appellant advances three grounds of appeal of which the second ground was accepted by the appellant to be the most important. In particular, it is said that the test under section 1(2) was applied too restrictively, paying insufficient attention to certain features of the description. The first ground relates to characterisation of the alleged invention and is not really separate from the second. The substance of the argument in the second ground relies on the first and was summarised by the appellant in his skeleton argument as follows.

“i. **The invention in question is an Artificial Intelligence Genome.** It's composed of three distinct parts:

- The genome itself- a self contained, modular, and hierarchical code structure designed to resemble the composition of a biological genome.
- The organiser - a manifest file containing what would be considered the genetic information of the genome.
- The controller - a program that monitors and records activity involving the genome, as well as controls the functions and use of the genome.

Like a biological genome, this AI genome defines the entities it was designed to help create.

ii. **Subjective and Highly Restrictive Interpretation of Precedent-Defining Rules** Examiner and hearing officer interpreted the 5 signposts test for software patent eligibility in the most restrictive way possible, and used the allowed discretion of their opinion to define what does and does not constitute a technical effect, even ignoring vital parts and uses of the invention to do so, as well as the wording of the test questions as they are stated, and the interpretation and assessing rules of the MoPP for computer-implemented inventions.”

20. The third ground of appeal was only lightly touched on at the hearing. It alleges that the hearing officer had not correctly construed what the applicant had said at the hearing below which resulted in the invention being rejected under “false pretences”. Although the ground was not formally abandoned, the point was not developed in oral argument and I will address it in the course of the dealing with the other points on characterisation. In my view, it does not have independent force.

DISCUSSION

(i) *Characterisation of the invention*

21. The invention is not clearly described in the specification. Although the application has a formally conventional structure, the difficulty arises with respect to its content and the use of some of the terminology. In his skeleton argument for the appeal hearing, the appellant described the invention as follows:

“9. The invention is a modular, autonomously self-modifying AI genome used to create digital and physical entities.

10. Present in an entity, it monitors and records the use of functions it provides to the entity.

11. At a point of amalgamation, it creates a new genome by selecting which modules to implement into a new genome and which to discard, and then doing it.

12. The genome is able to upgrade, backup, and fix itself.”

22. One difficulty with this characterisation is that it uses language to describe what is, in substance (and as he asserts) a function implemented in software by using analogies from the field of biology which do not have a clear or unambiguous meaning in the context of computer science or artificial intelligence. An “AI genome” is not a term of art in this field. The appellant does not contend that this description is any more than using an analogy to describe characteristics of the functionality which is implemented in software. That is clear from the specification as a whole and the way in which the appellant has described this as a “self-contained, modular, and hierarchical code structure” with the organiser as a “manifest file” and the controller being a “program”. Each of these either are, or are characteristic features of, computer programs. The use of biological analogies therefore needs to be treated with caution to determine what the actual subject matter of the invention is.

23. The “genome” is also said to be used to create “digital and physical entities”. It is not specific as to whether software is to create new physical entities and potentially contemplates the production of purely digital entity. It is also unclear how it is said that the genome is to “create a new genome” or how that alleged functionality could be achieved. No working example is given of that being done whether for any digital or physical entity. It is also unclear from the specification how the alleged “genome” could be used to produce any “physical” entities, although the description refers to the possible use in robotics.

24. Against that background, it was legitimate for the hearing officer to ask the appellant to explain in his own words where he said his invention lay and to explain what, in substance, he said his contribution was and, as the Comptroller submits, to take that into account in evaluating whether the statutory test was satisfied. At the hearing below the appellant and the hearing officer had the following exchange:

“MR. REAUX-SAVONTE: Okay, so the way the actual system was designed, this was actually made, in the actual application I make a direct comparison between the art of machine (inaudible) arm and the biological one just in case there was any misunderstanding. So a genome, a biological genome is essentially the code for a living organism and even biological genomes are split

up into modular parts. So at the lowest level we just have DNA and a group of DNA create a gene, groups of genes make a chromosome, and use of chromosomes make a complete genome. The way I have done it in the invention is computers have raw code but then that code can also be made modular. It is in the same way as a biological genome makes it. So in the application, with the raw code we can make up segments which makes up a code and which makes up the genome core. I directly relate each one of those to the biological modular segments of an actual genome. So the computational genome is a modular hierarchy of computer code by designing a specific way to allow the easy extraction and recombination of segments to form new genomes because that has to be the way it is done. It cannot be code – it can but it is just much more complicated, but where things are modular it is easy just to split and then reassign, combined with something else. It follows the pattern of biological genomes, that is exactly how they work where any code section, whether it is a genome or a chromosome, can be combined in other related similar sections to form a new genome, which is what happens during a reproduction process.

THE HEARING OFFICER: Okay, so if I have understood that correctly, what you have said or what I have understood you to say is that your invention is computer code, a sort of hierarchical or a modular arrangement of computer code that facilitates evolution over time so that the computer code is able to modify, adapt, change and improve over time in the same way that biological code evolves through, I think you said, reproduction.

MR. REAUX-SAVONTE: Yes.

THE HEARING OFFICER: Okay. Is that a sort of fair characterisation of your invention?

MR. REAUX-SAVONTE: Yes.

THE HEARING OFFICER: So, I can take it that the contribution that you have made or that is provided by the invention is a hierarchical system of computer code that facilitates evolution over time.

MR. REAUX-SAVONTE: Yes.”

25. This exchange confirms that the term “genome” in the application is used purely by way of analogy to refer to characteristics of a particular kind of computer code. It is said that the purpose is to enable the computer code to change and evolve in the same way as biological code evolves. The substance of the invention is a hierarchical system of computer code that facilitates evolution over time, as a result of its arrangement. I have read the specification more than once to check that the characterisation was not unfair. In my view the appellant’s characterisation of the contribution in that exchange sufficiently summarises the invention as described in the application at the relevant level of generality to determine whether the section 1(2) objection applies to it.
26. Because the appellant was unrepresented, I also drew the Comptroller’s attention at the hearing to the fact that not all of the claims were in the same form and queried whether there was an argument that the method claims should be treated differently. The Comptroller submitted that they should not be. The appellant did not suggest otherwise. I am satisfied that, applying the test of the case law, which requires the tribunal to focus on the substance of the invention, not the form of the claims, meant that no meaningful distinction could be drawn on the basis of this difference of form of the claims.

27. The appellant draws attention to the fact that the computer code as described may be used in the context of robotics and refers to a number of pages of the application (see for example pp14/19) where robotic applications are mentioned, to which the hearing officer did not expressly refer. However, these do not assist the appellant's argument, for reasons elaborated below.
28. I therefore conclude that the hearing officer's approach to identification of the contribution of the application was not open to objection. It was, in any event, well within the range of reasonable evaluations of the contents of the application as a whole.

(ii) *The Signposts and the Manual of Patent Office Practice*

29. The heart of the appeal concerns the application of the signposts which the appellant submitted had been done incorrectly and in an overly restrictive manner, having regard to the guidance in the Manual of Patent Office Practice ("the Manual"). He contends that the hearing officer ignored vital parts of the disclosure and exercised his discretion wrongly to define what did and did not constitute a technical effect.
30. It is convenient to deal with the points made by the Appellant on the Manual under the various signposts rather than separately. However, it goes without saying, and the Comptroller emphasises, that the Manual does not have the force of law (with one exception, I do not reproduce extracts). There is limited value in detailed examination of its gloss on what is itself a gloss on the statutory test. The statutory exclusion must be evaluated by reference to the Act and relevant case law. I therefore deal with the points of alleged conflict with the Manual only in view of the appellant's submission that the Comptroller has applied section 1(2) in an unduly restrictive manner and inconsistently with the practice summarised in it.

First signpost

31. As to the first signpost, the appellant contends that "when being used in the creation of robots, for example, this invention directly affects how said robot is put together, and that putting together of a robot is an outside process." He therefore submits that the claimed technical effect has a technical effect on a process which is carried on outside the computer.
32. I am not persuaded by this argument. It is true that the specification refers to the possibility of the use of the software described in robotics but it is not confined to that. The invention is about the way in which the computer software is said to evolve, regardless of whether it is implemented in any given context. A hierarchical system of computer code that facilitates evolution over time does not inherently have a technical effect carried out outside of a computer in the sense required by this signpost.
33. However, more fundamentally, as noted above, the appellant suggested that the invention "enables the healing and reproduction of AI genomes in an analogous way to biological genes in nature, thereby allowing the creation of physical systems outside a computer". As the hearing officer said, the application does not describe in

any detail how the way of structuring and organising data leads directly to the creation of physical systems outside a computer. It does not describe any actual system which does this, or how that should be designed. The hearing officer took the view that the application suggested that replicating the structure of computer code in the same way that the building blocks of biological life are understood to be organised should lead to the same results in computer systems as observed in nature. But, as he said, this was “purely theoretical”. In my view it is not established that the disclosure of the invention in fact enables that to be done. The first signpost cannot be satisfied in this case by pointing to a potential purely theoretical impact which it is not shown has been contributed by the invention. I was not persuaded that the hearing officer’s language (“it seems to me”) to which the appellant referred was expressing any doubt about this issue.

34. Moreover, the statutory exclusion does not cease to apply merely because a particular structure of a computer program can be applied over a wider area than mere data manipulation and may be instantiated in the context of robotics especially where, as here, the application does not provide sufficient guidance to a skilled person as to how that should be done.
35. I do not consider that there is anything in the Manual (especially section 1.38.1) which suggests that a different result would be appropriate in this case.

Second signpost

36. As to the second signpost, the appellant submits that the “invention defines what components are used in the creation of any physical or digital system”. His skeleton says:

“All aspects of the design of a system are architectural level. Also, this invention being the thing which directly controls what a machine is able to do without the need of software at a level above or below it – in the case of robots, for example – axiomatically means it has to operate at an architectural level because it can only then be firmware.”

37. It was not clear to me what exactly was being said by the appellant in this respect and the discussion at the hearing did not make the substance of the point clearer. However, I am not in any event persuaded that the hearing officer was wrong in his conclusion that this signpost was not satisfied. This signpost requires the tribunal to consider whether the contribution is made at the level of architecture of the computer or where the effect is produced irrespective of the data being processed or the applications being run. It is not good enough to avoid such an objection to say that, because characteristics of software are described at such a high level of generality as may render it applicable over a wider field, such satisfies the requirement of operating at the level of architecture.
38. Moreover, in so far as the invention is describing the characteristics of the software, it is describing the architecture of the software albeit at a high level of generality, not the architecture of the computer. The core aspect of the invention as described is that it has a structure that enables the code to change in a manner which has some analogies with biological systems. The concept of an effect being produced at the

level of architecture, is not in my view, what is contemplated in this application. The approach taken by the hearing officer does not conflict with the guidance in the Manual (see especially 1.38.2).

Third signpost

39. As to the third signpost, the appellant contends that “current systems: are not initially designed and built based on a genome, they do not function based on a genome, their use of function modules aren't monitored and recorded, there isn't a genome function to autonomously choose which functions are to be kept and which are to be discarded when creating descendent genomes, there isn't a genome program to create the descendent genomes, and, circling back to the beginning, a new system isn't designed and built based on the new genome. No current systems operate like this – physical or digital.”
40. This point does not engage sufficiently with the requirements of the third signpost or the hearing officer’s reasoning. The hearing officer said of this point that a computer system operating on new code does not imply that the system works in any way differently to how it would with the old code. He concluded that he was unable to find anything in the application that suggests that a computer system is being made to operate in a new way.
41. The conclusion does not seem open to criticism and I am not persuaded that there is anything in the Manual (especially section 1.38.3) which is contrary to it. The appellant’s argument under this head also conflates the issue of whether the software in question is novel or inventive with whether it is nonetheless excluded from patentability under section 1(2). As the Court of Appeal said in *Lantana Ltd v The Comptroller General of Patents, Design and Trade Marks* [2014] EWCA Civ 1463 at [19], there is no mandate in section 1 of the Patents Act 1977 for holding that it was sufficient to avoid the exclusion that there was an inventive step. Rather, it is a “deliberate legislative policy to exclude certain matters from patentability even if they would otherwise be patentable.”

Other points on the signposts

42. It was not suggested by the appellant that the other signposts made a material difference to the evaluation and I was not able to detect an error in the hearing officer’s evaluation of the fifth signpost which he analysed briefly in the decision under appeal. The appellant did not press any free-standing argument under the fifth signpost, separate from the other points.
43. Nor am I persuaded that anything said in the Manual at 1.39.3 relating to Artificial Intelligence and to which the appellant specifically referred takes the case further. This states:

“Inventions involving artificial intelligence (“AI”) are generally computer-implemented, so their assessment in respect of excluded matter will therefore mirror that of any computer-implemented invention. For example, if the invention uses conventional hardware (see [1.21.1](#)) the assessment will focus on the process that the hardware is programmed to perform considering all the

guidance found above in [1.35-1.39.2](#). Inventions involving AI may also be viewed as involving a mathematical method or algorithm so the guidance under [1.29-1.29.5](#) should also be considered. If an AI invention is directed to a specific technical process outside of a computer or if it forms part of the internal workings of a computer, then it will likely not be excluded. However, where an AI invention is directed to an excluded process (e.g. a business method) and there is nothing more to it, it will likely be excluded. Likewise, if an AI invention is directed to a non-specific purpose it may also fail by way of encompassing excluded processes ([see 1.15 & 1.19](#)). AI inventions or algorithms that provide an improvement in programming will likely be excluded following *Gale* unless they make a technical contribution ([see e.g. 1.29.4](#)).”

44. As the Comptroller has emphasised, this is not (and does not purport to be) a statement of law. It does not contain prescriptive guidance. The passage, like other parts of the Manual relating to excluded subject matter, envisages that each case, including those in the field of AI, must be decided on its own facts. It is, however, consistent with the requirement in the case law to focus on the actual contribution made by the invention as disclosed. It does not suggest that if an application does not contribute a solution to a technical problem relating to a technical process outside the computer, it will automatically escape objection on the basis that it suggests that the subject matter might be used in such a context.
45. Analysis of the signposts has been repeatedly stated only to provide indicia, none of which is individually conclusive as to whether the statutory test is satisfied. In focussing on them, it is important not to lose sight of the statutory test or the invention as a whole. Having regard to the manner in which the alleged invention was characterised in the application and what was (and was not) disclosed, the hearing officer had sufficient basis for concluding that the statutory exclusion applied. This court can only overturn the decision if sufficiently convinced that the hearing officer’s evaluation was wrongly based. The appellant’s arguments have not satisfied me to the required standard that it was. Rather than being able to point to an error of law or approach in the hearing officer’s decision, the appeal is impermissibly inviting this court to re-evaluate the matter afresh, taking a more generous approach.

Other points

46. Finally, the appellant referred at the hearing to two technical articles published well after the application.
47. The first is Howard et al, *Evolving Embodied Intelligence From Materials To Machines* published in *NATURE MACHINE INTELLIGENCE* Vol 1 January 2019 at 12-19. This describes at a general level a method for creating “a holistic design process for a new type of robot, specialized all the way from material to machine” using certain artificial intelligence techniques to specific characteristics of the robot as a whole and certain of its constituent parts. I was not directed to any passages of special relevance and no particular reliance was placed on it at the hearing.
48. The second is an article by Matt Simon in the science section of *Wired* magazine online edition dated 03.26.19 “Robot ‘Natural Selection’ Recombines Into Something Totally New”. This was said by the appellant at the hearing to be the more important

reference. The article focuses on certain ideas computer scientists have had of (for example) evolving leg shape designs of robots by combining randomly generated shapes, testing them for performance in a simulation and then combining characteristics of the best performers to create a new generation of improved performers. This is then repeated to create leg shapes which are well-adapted for a particular environment. This process is described as one which also involves introducing random mutations. The precise way in which this is done is not described but it contemplates a process of iterative computer modelling. The article describes first simulating the relevant environment for robots to navigate, “choosing and breeding those that perform best, then design slightly varied physical machines based on that”. In the article, the concept of “breeding” is described by way of analogy to refer to the act of producing a new design based on combining characteristics of an earlier generation. This article does not explain how such is to be done or the software used for the simulations or the design process. It states:

“Scientists in a fascinating field known as evolutionary robotics are trying to get machines to adapt to the world, and eventually to reproduce on their own, just like biological organisms. As in, someday two robots that are particularly well-adapted to a certain environment could combine their genes (OK, code) to produce a 3D-printed baby robot combining the strengths of its two parents. If the approach works, it could lead to robots that design themselves building beautifully adapted morphologies and behaviours that a human engineer could never dream up”.

49. These articles were referred to by the appellant without objection from the Comptroller but I am not persuaded that they take the case further.
50. The appellant submitted that they showed that “at least 2 different collaborative groups of computer scientists from different universities and organisations around the world have used or theorised the use of this exact same invention for the same types of use described in the originally filed application”. I was not persuaded of this at the hearing and re-reading them has not changed this view.
51. The application in this case does not show how a person skilled in the art could make robots that will “reproduce on their own” using the “AI Genome”. If a patent application refers to the merely theoretical possibility of applying an alleged invention to which the statutory exclusion does apply to aspects of robotics but does not provide sufficient information about how that should be done, the mere possibility of that being implemented in a way that the patent has not enabled does not mean that the patent application will escape the excluded subject matter objection. The statutory exclusion focuses on the contribution made and disclosed in the patent application under consideration, not on the contribution which may be made (possibly by others) using the subject matter of the application to create products or system to which an excluded subject matter may not apply.
52. The Simon article suggests that the concept of self-replicating robots using their software to create a new generation of robots by 3D printing is a problem to be solved in the future. The appellant’s application does not disclose a solution to that problem by creating (or, more specifically, enabling others to create) such a system or at least not without undue burden of research and development. There was no suggestion that

even the appellant had made or was even himself able to make a working system of the kind described in the Simon article using the description he had provided in the patent. This is consistent with the hearing officer's determination that the references to this were purely theoretical and that the application does not contribute to solving the problem. Moreover, no patent or application was referred to by the appellant relating to the subject of those articles or any decision of a court of tribunal holding that any aspect of what was described in those articles had not faced an excluded subject matter objection of a kind similar to that made in this case.

53. I therefore do not think that they assist in resolving this appeal.

CONCLUSION

54. For these reasons, the appeal is dismissed.

Order

55. I said at the hearing that if the parties agreed, any further submissions, including as to costs, could be made in writing.

56. A draft interim order has been supplied by the Comptroller. It is of a standard form and provides for extensions of time for consequential submissions including for permission to appeal.

57. I have given reasons for this decision considerably more fully than might otherwise be appropriate partly because the appellant was unrepresented. No indication has been received from him that a further appeal is to be pursued despite having had a draft of this decision for some days. I make the order in the terms proposed by the Comptroller but without thereby intending to suggest that an application for permission to appeal would have a realistic prospect of success.