WILLIAMS POWELL
PATENT ATTORNEYS • TRADE MARK ATTORNEYS • LITIGATORS
WWW.WILLIAMSPOWELL.COM • TEL: +44 20 7242 7005 • FAX: +44 20 7242 7115 • MAIL@WILLIAMSPOWELL.COM
11 STAPLE INN, LONDON, WC1V 7QH

UK Intellectual Property Office
Concept House
Cardiff Road
Newport
South Wales NP10 8QQ
United Kingdom

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Artificial Intelligence and Intellectual Property
Call for Views: Patents

Dear Sir/Madam,

Williams Powell has been involved in the prosecution of the Dr Stephen Thaler patent applications for the two inventions created by DABUS, an artificial intelligence system, referred to in your Open Consultation on Patents.

The Status of the DABUS UK Patent Applications

Since the publication of your Open Consultation on 7 September 2020, HHJ Smith has handed down his judgment in Dr Thaler's appeal (CH-2019-000339) against the decision of the Comptroller-General of the UKIPO (BL O/741/19) to refuse the naming of DABUS as the inventor of the two British patent applications GB-1816909.4 and GB-1818161.0, and which also held that Dr Thaler was not entitled to the rights in the inventions.

Dr Thaler has applied for permission to appeal the judgment of HHJ Smith and that application is currently pending review by the Court of Appeal. The grounds upon which Dr Thaler is seeking permission to appeal are not discussed here.

Should permission to appeal be refused or should any further appeal confirm the judgment of HHJ Smith as setting out the current state of UK patent law, the consequences of the judgment on the patenting of AI inventions will need to be considered. Some of the implications are reviewed below.

[redacted]

The Current State of the Law in Accordance with CH-2019-000339

Should CH-2019-000339 be confirmed, this will in our view highlight a number of fundamental shortcomings with current patent law in the United Kingdom with regard to the protection of AI inventions. These difficulties are likely also to apply in other jurisdictions, to the extent that their laws are deemed to be consistent with the position in the United Kingdom.

Many but not all of these shortcomings are highlighted in the Open Consultation of 7 September 2020. They put into question whether patent law remains fit for purpose having regard to the increasing likelihood of AI in the invention process.

The Substantive Consequences of the Judgment

The judgment in CH-2019-000339 has inevitable consequences not only on the patentability of inventions made by AI systems but also on the entitlement to the rights in those inventions.

There are three primary points arising out of CH-2019-000339 we would like to raise, namely:

1) The Act requires the inventor to be a person;
2) Entitlement to the rights in an invention made by an AI system;
3) Whether there is a mechanism in law to correct this.

An Inventor Must be a Person

The judgment of HHJ Smith held that the Patents Act 1977 requires the inventor to be a person [para. 46]:

> "I should stress that nothing in this analysis should be taken to suggest that DABUS is not itself capable of an inventive concept. As I have noted, I am proceeding on the basis that DABUS has "invented" the inventions the subject of the Applications. Nevertheless, I conclude that DABUS is not, and cannot be, an inventor within the meaning of the 1977 Act, simply because DABUS is not a person."

Paragraph 45(1)(c) states that a consequence of Dr Thaler's submissions, that DABUS (a "thing" in the learned Judge's words) is the only inventor, is that:

> "there is a class of invention – inventions where the inventor is not a person but a thing lacking personality, a machine – that is unpatentable

> not because the invention is not a patentable one, but because of the nature of the inventor".

This finding sets a requirement to patentability based upon the nature of the inventor. That is, an invention is not patentable if the inventor fails to meet a predefined "nature of the inventor", a human presumably, although not necessarily so as the judgment leaves the door open for inventors of another nature to be recognised [para. 23(2)]:

> "were an alien from outside the galaxy to present itself before the courts of England and Wales, I would like to think that it would not be denied legal personality simply on the grounds of unforeseen extraterritoriality."

This requirement based on the nature of the inventor constitutes neither one of the explicit requirements for patentability in the Act (consistent with, for example TRIPS, the EPC etc.) nor one of the explicit exclusions from patentability. It is based upon a presumption as to the nature of the inventor at the time of drafting the Act.

Notwithstanding this, the consequence of this finding in CH-2019-000339 is that an invention made by an AI system is not patentable. This leaves the AI industries (those that develop AI and those that work with AI) sorely deprived of patent protection for the investments and technical advances they are making.

HHJ Smith identified the problem with the finding that an AI system cannot be an inventor under the Act in footnote 26:

> "I heard no argument on the converse question of whether the owner of the machine that has "invented" an invention can him- or herself be regarded as the "inventor". Dr Thaler, as has been seen, denied that he was the inventor and the IPO – entirely rightly – therefore did not address the point. I raise this question, but without resolving it, in paragraph 52(2) below. It is entirely possible, for different reasons, that in the case of machine-created inventions, **there is no "inventor", and that the outcome I am seeking to avoid – an invention without an inventor – is reached because the person owning the machine is not the "actual deviser" of the invention**. As I explain in paragraph 52(2) below, this is not a question on which I can reach a view, as the point was not before me. However, it is important that I make clear that I consider the point an open one and that nothing in this judgment is to be taken as determining it." *[Emphasis added]*

In other words, if no natural person can claim to have contributed to the making of the invention (that is can claim to be an "actual deviser of the invention" in accordance with Section 7(3) of the Act), as in the case of the DABUS inventions, there results a patentable invention with no inventor. The Act does not in any way contemplate a patentable

invention with no inventor, and HHJ Smith was of course right to highlight this. We address below the question whether current patent law might permit the owner of the AI system to be deemed the inventor by way of ownership of the invention.

Entitlement to the Rights to an Invention Made by an AI System

The second principal point of CH-2019-000339 related to Dr Thaler's rights to the DABUS inventions.

Dr Thaler argued that he was entitled to rely on the general rule of law that the owner of a machine is entitled to the output of that machine. In fact, Dr Thaler not only owns DABUS but designed DABUS and operates it. The learned Judge accepted this contention [para. 49(3)(a)]:

> "Although the IPO rightly warned against over-generalisation, I am quite prepared to accept that there is a general rule that the owner of a thing is owner of the fruits of that thing. Thus, the owner of a fruit tree will generally own the fruit produced by that tree."

Dr Thaler also argued that he was entitled to the rights in the DABUS inventions under the principle of accession, but that was not addressed in the judgement. Dr Thaler did not refer to copyright law in his submissions, because patent law currently does not comprise any provision analogous to that of copyright law, specifically Section 9(3) of the Copyright, Designs and Patents Act 1988.

HHJ Smith held, however, that this general rule of law cannot apply [para. 49(3)(c)]:

> "Moreover, in the context of patents, there are particular difficulties. That is because – unlike in the case of the hypothetical fruit tree or, indeed, copyright – merely inventing something does not result in a patent being granted to the inventor. As has been seen, in order to be granted, a patent must be applied for – and that must be done by a person. It is therefore quite impossible to say that simply because (i) DABUS has invented something and (ii) Dr Thaler owns DABUS, Dr Thaler is entitled to the grant of a patent. There must either be an application by the inventor within section 7(2)(a) (which cannot be made because DABUS is not an inventor nor a person) or the inventor must have transferred the right to apply enabling Dr Thaler to apply under one of section 7(2)(b) or (c) (which again cannot be in this case)."

The effect of this finding in CH-2019-000339 is that the owner of an AI machine will own the output of that machine *as long as* that output is not inventive in accordance with the Patents Act 1977, in which case Section 7 will apply. In other words, if the AI system has autonomously made an invention that meets the requirements for patentability set out in

the Act (Sections 1to 4), the owner of the machine has ***no*** rights to invention, that is loses any rights they might otherwise have had.

As a consequence, not only is the invention not patentable but the owner of the machine has no rights in the invention.

The consequences of this finding leaves a huge void in protection for our AI industries and risks that they might migrate to the first country that provides them the support they need and deserve.

Is There an Avenue in Law to Correct This?

Paragraph 49(3)(d) of CH-2019-000339 states:

> "It would be far easier to contend that Dr Thaler was entitled to the grant of a patent pursuant to section 7(2)(a) of the Patents Act 1977, on the ground that he (Dr Thaler) owned the machine that did the inventing. That would actually be a much closer analogy to the general proposition advanced by Dr Thaler that "if you own the machine, you own the output of that machine". However, as I have noted, this was not a contention advanced by Dr Thaler: indeed, it was positively not advanced."

Similarly, paragraph 52(2) states:

> "As I have noted, the question of whether the owner/controller of an artificially intelligent machine that "invents" something can be said, him- or herself, to be the inventor was not a matter that was argued before me. Dr Thaler expressly declined to advance that submission not merely because he considered it bad in law, but more importantly because (in moral terms) he considered that he would illegitimately be taking credit for an invention that was not his. Clearly, what arguments are or are not framed in relation to patent applications are matters for the applicant. However, I would wish to make clear that I in no way regard the argument that the owner/controller of an artificially intelligent machine is the "actual deviser of the invention" as an improper one. Whether the argument succeeds or not is a different question and not one for this appeal: but it would be wrong to regard this judgment as discouraging an applicant from at least advancing the contention, if so advised."

This contention was positively not advanced for Dr Thaler for the reason that in our view current patent law does not and cannot accept it.

Copyright law does, of course, include the well-known provision [CDPA 1988 Section 9(3)]:

> "In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken."

Leaving aside the question whether this provision remains fit for purpose given the huge advances in AI over the 32 years since the writing of the CDPA 1988, the Patents Act 1977 does not include an analogous provision. The Patents Act does not define or provide in any way for a "legal inventor" to replace the actual creator (deviser) of the invention.

In contrast with copyright law, the Patents Act provides no mechanism by which a non-inventor could deem themselves to be an inventor and to derive rights from that deemed inventorship. Section 7(3) of the Act is absolutely clear in stating that the inventor is (and only is) "the actual deviser of the invention". It does not leave room for anyone else to claim inventorship.

Dr Thaler is not an "actual deviser" of the DABUS inventions (and the same would apply to any other invention created autonomously by an artificial intelligence). As a consequence, Dr Thaler cannot under the provisions of the Patents Act name himself as an or the inventor as he is not the "actual deviser of the invention".

Were Dr Thaler to do so, he would, in the words of Lord Hoffmann in *Yeda Research and Development Company Limited v Rhone Poulenc Rorer International Holdings Inc and Others* ([2007] UKHL 43), be a "deemed or pretend" deviser of the invention, which is not permissible.

Specifically, Lord Hoffmann stated [para. 20]:

> "The inventor is defined in section 7(3) as "the actual deviser of the invention". The word "actual" denotes a contrast with a deemed or pretended deviser of the invention;"

While Lord Hoffman continued to explain that the actual deviser of the invention is the natural person "who came up with the inventive concept", that does not provide a basis for a deemed or pretended deviser of the invention to be considered the "actual deviser of the invention" solely for the reason that the invention was created by someone else or by something else, in this case an AI system, and that they own the entity that actually devised the invention.

Additionally, in Dr Thaler's case, Dr Thaler is a natural person, but what if the owner of the AI system were a corporate entity? In such circumstances, the premise that the owner of the AI system could be deemed the inventor by virtue of ownership of the AI system would result in a corporate entity being named as the inventor. That surely cannot be a desirable outcome.

Not only does Section 7(3) provide an exclusive determination of inventorship but it also sets out the basis upon which entitlement to the patent ensues.

Unless patent law were to be amended to allow a deemed or pretended deviser of the invention to designate themselves as the actual inventor, a person cannot deem themselves an inventor for the sole reason that the invention was made by an AI system they owned.

There is therefore no provision in the Patents Act or in the case law that would give that non-inventor the right to be granted a patent for that invention. Moreover, following the finding in CH-2019-000339, none of the provisions of Section 7(2) of the Act entitles a non-inventor (that is a non-deviser of the invention) the rights to the invention for the reason that the rights to be granted a patent derive solely and exclusively from the actual inventor and on one else. Inventorship is a matter of fact and the law does not provide a "right" to inventorship.

Summary

The judgment in CH-2019-000339 seems therefore to establish a legal impasse with significant commercial implications in relation to inventions created by an artificial intelligence.

This is likely to create a disincentive to the AI industry, failing to address the point made by the UKIPO in its Open Consultation, that is:

> "Patents incentivise invention in two main ways. They encourage investment in research and development because, as exclusive rights, they give the owner the opportunity to secure a return. The publication of the patent allows others to learn of technical advances, so an invention can be further developed or worked around.
>
> The government wants to make the UK a global centre for AI and data-driven innovation. It aims to make sure that the UK has a best environment for developing and using AI."

It should be pointed out that even a human inventor may never own the rights to their invention, for instance an employee, and it is therefore not necessarily the inventor who needs the incentive but the entity that makes the investment leading to the invention and which will ultimately benefit from that investment.

The Need to Accommodate in Patent Law Inventions created by AI

The UKIPO is quite right in raising in its Open Consultation the issue that the nature of AI systems themselves and their potential to innovate independently may present challenges

to the current patent system. If AI cannot be credited as being the inventor in patent law, and if their inventions are deemed unpatentable, not only will this discourage future AI inventions from being protected by patents (fundamentally because they cannot be), but this will also act as a disincentive to the AI industry in this country and also to the dissemination of inventions and inventive technology created by AI systems.

There is no denying that the DABUS cases present a challenge to the construction of the Patents Act. However, in the words of HHJ Smith in CH-2019-000339:

> [para.23(2)] "It may very well be that the common law or a scheme laid down in statute does – when appropriately construed or understood – cater for future developments, including developments that were – until they surfaced in litigation – unforeseen. To take a somewhat extreme example, were an alien from outside the galaxy to present itself before the courts of England and Wales, I would like to think that it would not be denied legal personality simply on the grounds of unforeseen extraterritoriality."

The whole purpose of patent law is to deal with the unforeseen and to provide protection to those that create it (as long as it satisfies the provisions of Sections 1-4 of the Act and is properly applied for).

As the UKIPO rightly points out in its Open Consultation:

> "Britain may have the longest continuous patent tradition in the world. Its origins can be traced back to the 15th century."
>
> "At the time, this [the Patents Act 1977] was the most radical piece of patents legislation to be passed for nearly 100 years."
>
> "The government wants to make the UK a global centre for AI and data-driven innovation. It aims to make sure that the UK has the best environment for developing and using AI."

The current state of the law, following CH-2019-000339, falls far short of this and our country's long tradition of being at the forefront of protecting patentable inventions.

What Other Options Are There Within the Framework of Current Patent Law?

Does Section 13 require the applicant to name a natural person as the inventor or can it permit no person/inventor to be named?

One argument put forward for Dr Thaler was that Section 13(2)(a) could be read on a normal interpretation as permitting no inventor to be designated if there is no human

inventor. While Dr Thaler had named DABUS as the inventor, Dr Thaler contended that he did not need to do so.

The 2020 AIPPI World Congress of 9 October, 2020, reached a similar conclusion. Specifically, its resolutions included:

> "2) An invention should not be excluded from patent protection merely because an AI contributed to the invention.
>
> 5) An AI should not be considered an inventor or a co-inventor of an invention, nor be permitted to be named as such, even if no contribution to the invention by a natural person is identifiable."

In other words, an invention created by an AI system should not be excluded from patentability but the AI system should not be named as the inventor, and this applies even in cases where no natural person can be named as an inventor.

This solution may address the issue with the designation of the inventor, but it must go hand-in-hand with the right to the invention being deemed to vest in the owner/creator/operator of the AI, as appropriate.

The Questions Raised in the Open Consultation

1) **What role can/does the patent system play in encouraging the development and use of AI technologies?**

We refer to the submissions made above. The development and use of AI technologies already plays a very important part in our lives and is making an increasing contribution to the GDP of the United Kingdom. It is important to provide an environment in the UK that fosters innovation in AI and investment in AI. The patent system is a very important tool in achieving this.

2) **Can current AI systems devise inventions? Particularly:**
a) to what extent is AI a tool for human inventors to use?
b) could the AI developer, the user of the AI, or the person who constructs the datasets on which AI is trained, claim inventorship?
c) are there situations when a human inventor cannot be identified?

The answers to these questions are dependent upon the facts of a particular case. The position is no different, and should be no different, from any collaboration between various people in the traditional sense. Ultimately, the determination of inventorship must be based upon the particular invention and the contribution(s) to that invention, in other words who or what as a matter of fact is the or an "actual deviser of the invention". We submit

these are considerations that are well within the ambit of our Courts to determine and that the same principles as have been applied in the past are equally applicable when a contribution from an AI is to be assessed.

3) **Should patent law allow AI to be identified as the sole or joint inventor?**

There is a potential distinction underlying this question. In the DABUS cases it was accepted that DABUS created the inventions. However, it was decided that since DABUS is not a "person", DABUS could not be designated as the inventor in accordance with the Act. If a distinction is to be made between the actual "creator" of the invention and a "legal inventor" then, as suggested by the AIPPI, perhaps no inventor should be designated on the patent application.

In our view, it is important at least to acknowledge the fact that an AI created the invention, in order to warn the public. This is relevant, of course, in connection with any potential challenge to inventorship or ownership, as the publication of a patent application must contain the information necessary for a third party to be able to establish the derivation of the invention and rights in the patent in order to be able to mount any challenge thereto, specifically under Sections 8, 12, 37 and 72 of the Act.

4) **If AI cannot be credited as inventor, will this discourage future inventions being protected by patents? Would this impact on innovation developed using AI? Would there be an impact if inventions were kept confidential rather than made public through the patent system?**

The current position is that AI created inventions are not only excluded from patentability (unless a person names themselves as a "deemed or pretend" inventor), with all the potential consequences that entails, but also that *no person* will be entitled to a patent for that invention. This is a serious disadvantage that will adversely impact the industry, investment and progress in the manner envisaged by the question.

5) **Is there a moral case for recognising AI as an inventor in a patent?**

DABUS, as any other AI system, is an AI system owned as personal property and it does not have legal or moral rights. Moreover, it does not deserve moral rights and does not have moral interests. However, we believe it is important to designate the AI system as an inventor because the public has a right to know the identity of the actual deviser of an invention, and also because so doing will protect the moral rights of human inventors. This will prevent people from taking undeserved acknowledgment for the work of machines and from equating human inventive activity with someone merely asking a machine to do work.

It was an accepted principle at the time of drafting the EPC that a natural person who is an inventor has a moral right to be named in a patent application filed by another person or entity. Discussions on this point during the writing of current patent laws, for instance in the *Travaux Préparatoires* leading to the EPC at IV/4860-61-F, were indisputably focused on natural persons as inventors.

An AI machine's lack of rights does not impact on the obligation on the applicant to name the actual deviser of the invention. In any event, the issue of inventorship must be determined before one can claim to have any moral right to be named as an inventor as no one has a moral right to be named unless and until it is established that they are in fact an inventor.

The principle of a moral right has to be considered to its fullest extent and not just limited to consideration of a person who is an inventor. The public has a moral right to know who is/are the actual inventor(s) of an invention disclosed in a patent application or patent. This becomes ever more relevant as AI systems generate ever more sophisticated technologies and often technologies that are beyond human capacity to develop (such as those derived from the processing and analysing of vast amounts of data).

It would be morally wrong, as well as legally wrong, for an applicant to fail to identify the inventive contribution of an AI system as this would lead to a misrepresentation as to the origin of the inventive concept(s) disclosed in the patent application.

Moreover, inaccurately listing a natural person for an invention devised by an AI system would dilute the very principle of naming the inventor and would be unfair. While it would not be unfair to the AI system, which has no legal rights or interest in UK law, it would be unfair to other human inventors because it would equate the work of legitimate human inventors with those who were merely associated with an AI system that actually made the invention.

6) **If AI was named as sole or joint inventor of a patented invention, who or what should be entitled to own the patent?**

We refer to our observations above.

7) **Does current law or practice cause problems for the grant of patents for AI inventions in the UK?**

Yes, it does. We refer to our observations above.

8) **Could there be patentability issues in the future as AI technology develops?**

There may very well be considerations in terms of inventive step and the skilled person. However, these considerations are likely to be inevitable the more prevalent the use of AI is in the making of inventions, whether autonomously or as a team with natural persons.

9) **How difficult is it to secure patent protection for AI inventions because of the list of excluded categories in UK law? Where should the line be drawn here to best stimulate AI innovation?**

The current list of excluded categories of inventions need not necessarily be revisited solely because they may be devised by an artificial intelligence. They ought to be revisited in any event over the course of time to ensure that they do not necessarily stifle innovation and investment, irrespective of whether that is of natural persons, AI systems or, increasingly commonly, a combination of the two.

10) **Do restrictions on the availability of patent rights cause problems for ethical oversight of AI inventions?**

They may very well do if a consequence is that AI inventions are kept secret as a result of patent law failing to give protection for them.

11 and 12) **Does the requirement for a patent to provide enough detail to allow a skilled person to perform an invention pose problems for AI inventions? In the future could there be reasons for the law to provide sufficient detail of an AI invention for societal reasons that go beyond the current purposes of patent law?**

There is, we suggest, a recent parallel in the biochemical field, where special provision had to be made to safeguard "disclosure" of the inventions. It may very well be that similar provisions may be necessary for AI inventions. These could be addressed pre-emptively or allowed to develop over time as and when the issues are considered by our Courts.

13 and 14) **Does or will AI challenge the level of inventive step required to obtain a patent? If yes, can this challenge be accommodated by current patent law? Should we extend the concept of "the person skilled in the art" to "the machine trained in the art"?**

It will be necessary to address this whether or not patent law makes explicit provision therefor. As and when cases are brought before our Courts raising these issues, it will be necessary to address the points, in dependence on the facts of the case. That said, if AI is to be encompassed within the definition of obviousness (as a tool for example) or of the

skilled person, it seems this would have to apply irrespective of whether an AI is involved in the invention under consideration. Otherwise, there is the risk of the development of two different standards for patentability, which are also likely to overlap in a manner that will be very difficult to separate.

15) **Who is liable when AI infringes a patent, particularly when this action could not have been predicted by a human?**

Ultimately, unless AI is given legal personality, it cannot be held liable and we suggest that the liability should rest with the owner and/or user of the AI. There has been, of course, an attempt by the European Parliament to suggest a legal personality for AI systems, in 2015, but this was rejected. Similarly, the Estonian consideration of a Krat law resulted, we believe, in a conclusion that liability should rest with the entity responsible for the AI system. In the case of patent infringement, this might/ought to be the entity that benefits from the infringement.

[redacted]
Williams Powell