EMOTIONS RUNNING HIGH:
ANALYSIS OF THE UK SUPREME COURT JUDGEMENT IN
EMOTIONAL PERCEPTION *vs* COMPTROLLER GENERAL [2026] UKSC 3

The fiction of Frankenstein, the death of Mr Aerotel and the Inventive Contribution of Cluedo's Professor Plum

Introduction

On 11 February 2026, the UK Supreme Court "UKSC" handed down its judgement in ***Emotional Perception vs Comptroller General of Patents [2026] UKSC 3***. According to the judgment, at stake were "issues of fundamental importance for the UK's application of the EPC to computer-implemented claims, particularly in the rapidly expanding field of AI."

This landmark decision will form the cornerstone of practice for both the interpretation of the statutory exclusions to patentability and the objective assessment of inventive step/obviousness. The decision has implications beyond AI and computing, influencing the ability to acquire patent rights in other technologies.

The decision's implications are more than just legal, extending to strategic considerations and touching on the UK's underlying competitiveness and macro-economic performance.

Several tenets of national and, indeed, international patent law were raised over the course of these proceedings, including:

1. What is excluded from patentability and, particularly, what do the words "*as such*" mean in terms of statutory exclusion? The decision touches on the meaning behind the phrase "*in all fields of technology*," as required by **Art.27(1) TRIPS**. This corresponds to **section 1(2) UK Patents Act** "UKPA".
2. What amounts to *invention*? This is essentially **section 1(1) UKPA**, section 130(7) UKPA and **Art.52(1) EPC**.
3. How is *inventive step/obviousness* objectively assessed? This corresponds to the tests exercised under **section 3 UKPA** and to what extent, if any, alignment could be achieved with ***G1/19-Bentley Systems (UK) Ltd/Pedestrian Simulation*** of the European Patent Office's "EPOs" Enlarged Board of Appeal "EBA".
4. What is a computer and a program for a computer?
5. What is an artificial neural network "ANN", particularly in the context of a computer and a program for a computer?

Executive Summary of the Decision

As the instructing attorney for Emotional Perception AI "EPAI", my summary of - and observation on - this decision are, hopefully, timely and insightful:

1. The long-standing *Aerotel* technical contribution with rider approach is rejected. The Supreme Court described the reasoning in *Aerotel* to be "unsound" and so "should not be followed." The EPO's "*any hardware*" approach is now adopted as the correct interpretation of UK legal statute, with the presence of any piece of hardware defeating the statutory section 1(2) exclusions to patentability. Any hardware was recognised as realising a very low threshold, with the real work to be shouldered under inventive step.
2. Once the statutory exclusion is overcome, the approach by the UK to assessing invention should follow [100]-[111] of the decision the principles of the "two-hurdle approach" and the "*intermediate step*" of *G1/19* and ***T0154/04-Duns***

Licensing Application, i.e., whether the "subject matter of the claim qualifies as an invention, by applying article 52 of the EPC."

3. Feature interaction is key. The intermediate step exists between the "any hardware" and inventive step assessments. This intermediate step is a "necessary part of the process of applying articles 52 to 56 (at least) of the EPC." The intermediate step serves as a filter for features contributing to a technical solution of a technical problem in view of the closest prior art, with only those distinguishing features contributing to inventive step. It is particularly relevant for "mixed" inventions because it qualifies that patentable invention requires consideration of features which contribute to the technical character as assessed in the context of the invention "as a whole."
4. There are many ways to assess inventive step. A later referral to the UKSC may see these fully explored, including problem-solution.
5. The UK ***Pozzoli*** inventive step test remains sound as a base, with the court's guidance placing a slight English lilt on obviousness assessment relative to ***T641/00-Comvik*** and the EPO's preferred use of ***problem-solution***.
6. An ANN is a computer program.
7. A "claim directed to a computer-implemented invention avoids exclusion under Art 52 EPC merely by referring to the use of a computer, a computer-readable storage medium or other technical means."
8. There remain some potentially significant and vexing implications for the definitions of computer and a program for a computer. Taken from the judgment:
    a. a *computer* is now considered to be 'a machine which processes information through performing computations,' and
    b. a *program for a computer* is "a set of instructions capable of being followed by a computer (of any kind) to produce desired manipulations of data."
9. On at least some of these decided matters, the UKSC decision is likely to carry influence in other jurisdictions, such as Commonwealth countries and possibly also at the EPO.

A Brief Recap of the Technology

At the heart of the claimed invention was whether artificial neural networks (ANNs), a core component of AI systems, can be considered patentable inventions under UK law.

All ANNs are approximation machines. Their strength lies in their ability to interpret data. ANNs self-learn, based on a training data set, and are capable of addressing intractable problems, i.e., those problems which have indeterminate variables, and which therefore cannot be addressed by coding within a conventional computer programming environment.

The objective of the EPAI invention was to "close the semantic gap" between the output of an ANN and how people interpret information for the sake of reason. The application of EPAI technology provides an improved recommendation or search engine within a better and simpler system.

It has implications for internet searching and fast identification of relevant content, e.g., a song, film or effective medical treatment regime.

The invention is not a "classifier," so it does not rely on the limitations associated with taxonomy. Rather, the inventors appreciated that semantic information has a higher value, so if it were possible to map highly variable semantic information to physically extractable information then the resulting neural network could be trained more closely to reflect human perception. The technology developed the principles of "Embedded Vector" search now prevalent in commercial products.

Technically, measured separation distances between pairs of files in different semantic and property embedding spaces held the key to being able to generate the "map." For example, during training, Pink Floyd's "Wish You Were Here" might be assessed relative to Mozart's Horn Concerto. After training, only extracted physical properties from a query file need to be applied to the "frozen" ANN – a new product within a new system - to identify previously unknown but relevant and semantically close files stored within a database. Adapting a metaphorical explanation provided by the UKIPO at the UKSC hearing, Colonel Mustard or Professor Plum [of Cluedo® fame] might input a seed track, Elgar's "Nimrod", into the ANN, which ANN then extracts physical data to produce a unique vector output imbued with semantic qualities. The system then uses this vector to identify and then retrieve a contextually similar piece from, perhaps, a little-known contemporary artist. In the music industry, this addresses the issue of "cold start."

Dissection of the Judgement

Before deep diving into the significant points of practice that arise from this decision, it is useful to appreciate the *modus operandi* of the UKSC with respect to precedent and, particularly, how decisions from the EPO Technical Board of Appeal "TBA" or EBA are treated by UK courts.

In ***Conor Medsystems Inc v Angiotech Pharmaceuticals Inc*** **[2008] UKHL 49; [2008] RPC 28**, para 3, Lord Hoffmann confirmed that the UK courts are not strictly bound by any decision, including those of the EBA. However, the courts "should respect and follow the Enlarged Board's decisions and any uniform jurisprudence of the Boards of Appeal unless convinced that they are wrong or beyond the ambit of reasonable difference of opinion." This sentiment is perhaps more memorably encapsulated by Jacob LJ in ***Actavis UK Ltd v Merck &Co Inc*** **[2008] EWCA Civ 444; [2009] 1 WLR 1186, para 48**:

> "In saying our courts would and should normally follow the settled jurisprudence of the European Patent Office it should be understood, of course, that they are not bound to do so. In the unlikely event that we are convinced that the commodore is steering the convoy towards the rocks we can steer our ship away."

The commodore – and not the 1980's computer – certainly steered a clear course in this judgment, dispatching the UKIPO's concerns about the potential for a "Frankenstein monster" test (see [53] to [55]) allegedly born from ***Pozzoli SpA v BDMO SA*** **[2007] EWCA Civ 588; [2007] FSR 37** being adapted by ***T641/00-Comvik***. From the outset, this seemed unlikely, but also that .

Statutory Exclusion

To provide a context for the gravity of just overturning *Aerotel*, it is worth recapping on this now defunct test for statutory exclusion [***Aerotel Ltd v Telco Holdings Ltd* [2006] EWCA Civ 1371; [2007] Bus LR 634; [2007] RPC 7**] and the reasoning in today's UKSC decision.

It is fair to say that *Aerotel* was not wildly appreciated by the profession because it supported the wholesale rejection of patent applications and seemed arbitrarily applied, but it was of its time. For those unaware, both CIPA and the IP Federation filed intervention briefs at the UKSC, not least because of an observed divergence in results for patentable invention between the UK and EPO but, anecdotally, most probably because *Aerotel* was, when applied, highly restrictive.

The *Aerotel* four-steps were:

(1) properly construe the claim;
(2) identify the actual contribution, with this aspect "asking what, as a matter of substance rather than form, the inventor has really added to human knowledge;"
(3) ask whether it falls solely within the excluded subject matter [qualified as "merely an expression of the 'as such' qualification of Art.52(3)"];
(4) check whether the actual or alleged contribution is actually technical in nature.

Prior to this suite of litigation by EPAI, a settled position at the EPO on "any hardware" had not been reached; this changed with *G1/19*. Earlier cases considered by the UK courts had, consequently, not effectively argued harmonization required by section 130(7) UKPA. As the court acknowledged, the time for reconsideration *Aerotel* was ripe. The nature of the EPAI invention, furthermore, relates to burgeoning 21st century AI technology and therefore is highly pertinent to the economy in general.

Consigning *Aerotel* to the annuls of history, the court at [20] stated:

> "the *Aerotel* approach [i.e., the "technical effect approach with rider" in which that novel or inventive purely excluded matter does not count as a technical contribution] should not be followed, in the light of *G1/19*, and that the UK should adopt the same interpretation of article 52 as the Enlarged Board… we will explain, this does not in our view require UK courts to change their approach to the analysis of what amounts to an inventive step although it may require some modification."

As to the guidance on qualifying invention (see [110+]) and then inventive step/obviousness [65], these are discussed below in other sections.

The full justification for the rejection of *Aerotel* spans multiple paragraphs, predominantly at [56] to [64]. Extracting and paraphrasing the most salient parts, the assessment used in *Aerotel* - about what the technical contribution of the invention has added to human knowledge - mixes apples with pears. This contrasts with the " uncluttered" EPO "any hardware" approach that is not linked to any preconception or prejudice arising from mixing together the four independent requirements of a patentable invention. The court expressly said, "It is fair comment that the "any hardware" test imposes only a low hurdle, but this is justified by the EPO as stemming from the addition of "*as such*" to each of the excluded items by article 52(3)." This ties back into the "all fields of technology" requirement of both Art.52(1) and Art.27(1) TRIPS. And to

qualify the justice's desire for requiring change, in contrast with the implicit order of attack in settled *G1/19*, the 4-steps of *Aerotel* both put the cart before the horse [34] and misunderstood the true nature of the term "invention." At [63]:

> "The *Aerotel* approach at best jumbles up the test of an invention with the other requirements for patentability (if indeed it mentions that first question at all) and reverses the logical order of analysis by starting with contribution to the known art (step 2), then addressing the article 52(2) exclusions (step 3), and then finally going back at step 4 to the "technical in nature" question, which is really an aspect of article 52(1)." [64] "Of course, there is nothing wrong with step 1 in the *Aerotel* approach (construe the claim), nor has the EPO suggested that there is. But steps 2 to 4 cannot be maintained."

Revision of the Manual of Patent Practice "MOPP" can therefore be expected in its next update, supplemented by an earlier and imminent notification that any hardware is now to be applied as the test for exclusions on an invention. This is a material and long-term change for practice. Moving to "any hardware" has implications for other technologies, such as business methods.

Qualifying Invention: The Two Hurdle, Three Step Approach

The decision (at [42] and [100] onwards) explains that understanding the nature of invention and the nature of claim feature interaction is essential and is set out in *G1/19* at its [32] [33]:

> "Whether such [non-technical] features contribute to the technical character of the invention has to be assessed in the context of the invention as a whole."

> "An invention may have (i) technical features which contribute, (ii) technical features which do not contribute, (iii) non-technical features which contribute and (iv) non-technical features which do not contribute to the technical solution of a technical problem and thereby potentially to the presence or not of an inventive step… , features according to (iii) have been established by the case law described above (Dun's principle (F): non-technical features interacting with the technical subject matter of the claim for solving a technical problem). Case (ii) occurs if features that *per se* qualify as technical cannot contribute to inventive activity because they have no technical function within the context of the claimed invention."

In *G1/19*, in adopting "any hardware" to clear the invention requirement, the inventive step hurdle has been increased, so an *intermediate step* is required (recited in this decision at [43]):

> "[39] The two-hurdle approach for computer-implemented inventions actually entails three steps. Establishing whether a feature contributes to the technical character of the invention constitutes an intermediate step between assessing (i) the invention's eligibility under Art.52(1) EPC, and (ii) whether the invention is based on an inventive step *vis-à-vis* the closest prior art. This additional intermediate step serves as a filter for features contributing to a technical solution of a technical problem in view of the closest prior art. Only those distinguishing features can contribute to inventive step."

In summary (see [101] and [107]).

> "features of the claim which are to be included and those which are to be excluded at step (2) depends upon "interaction", as described….
>
> the intermediate step is, in terms of its function, concerned entirely with excluding features of the invention from subsequent consideration rather than with determining the patentability of the invention as a whole. Its object is to filter out features which do not contribute to the technical character of the invention viewed as a whole, so as to exclude those features from consideration at step (2) (inventive step). Or, put in positive terms, it is to allow consideration to be given at step (2) only to those features which do so contribute. It calls for a dissection of the subject matter of the invention into its component features and a review of the contributory role of each feature, by reference to the contribution made by that feature to, or interaction with, the technical character of invention viewed as a whole."

Claims can qualify as an invention even if they contain predominantly non-technical features [101]. This is principle (F) of the Duns principles. In fact, a claim may legitimately consist of a mix of technical and non-technical features, in which the non-technical features may even predominate. Non-technical features "as such" do not provide a contribution to the prior art and are therefore to be ignored in assessing novelty and inventive step at the subsequent stage (2) assessment. But the phrase "non-technical features as such" means (and means only) "non-technical features which do not interact with the technical subject matter of the claim.

Qualifying what is meant by "invention" through feature interaction is an independent and important aspect of this decision.

Inventive Step

By rejecting *Aerotel* and applying "any hardware", the EPAI claim was to an invention for which a patent could be granted, and importantly it was not excluded for reasons of it only relating to excluded subject-matter "*as such*." The EBA's interpretation of Art.52 prevails (see [24]).

The real test is identifying the technical parts of a mixed invention as part of - or more particularly as an intermediate step before - undertaking the analysis of novelty and inventive step.

So how does one now go about assessing inventive step in an objective fashion?

Adoption of "any hardware" does not inevitably create the "Frankenstein monster" arising from any hardware + problem-solution. This would abandon the Supreme Court's earlier guidance (see ***Actavis Group PTC EHF v ICOS Corpn*** **[2019] UKSC 150**) that *Pozzoli* remains generally appropriate for assessing obviousness for all technologies under UK law. Moreover, full-scale adoption of problem-solution (a) was not argued by the parties, and (b) would require a panel of seven justices (see [53] and [54]).

Problem-solution, although preferred by the EPO, is not the only way to assess inventive step and it is not mandated by the EPC. There are other mechanisms, including the recent proposition of 'concrete elaboration.' At [65]:

> "all that the EPC tells you about how to decide whether the claim involves an inventive step is (in article 56) that a step is inventive if it is not obvious to a person skilled in the art. We see no reason to doubt that, as confirmed by this court in *Actavis v ICOS,* the approach to inventive step laid out in *Pozzoli* remains a legitimate approach."

I apologise now for stating – and therefore teaching my grandmother to suck eggs - that problem-solution involves identifying, by reference to the closest prior art in the technical field of the invention, a technical problem which the invention claims to solve, and then assessing whether the technical feature(s) which form the claimed solution could be derived by the skilled person in that field in an obvious manner from the state of the art. And that the problem can be framed as 'an aim to be achieved in a non-technical field and in which,' per Headnote 2 of *Comvik*. The context of this holding is that the Board of Appeal recognised that the general principles reflected in the EPC require patents to be available for inventions "*in all fields of technology*" and that "technical character is a *sine qua non* for an invention in the sense of the EPC."

Personal observations on the practical application of *Comvik* at the EPO, however, suggest that the relevant interactions - in the context of the invention as a whole - are sometimes unreasonably treated with a dismissive broadbrush. Others may hold a different perspective. In this respect, I am minded to recall an informal statement made to me during an EPO appeal hearing that I argued a decade or more ago, "It is too easy to throw too many things out of the basket when considering the issues of inventive step."

As it stood and as it stands still, *Pozzoli* (adapting the earlier *Windsurfing* test) sets out the approach to determining inventive step/obviousness as:

> (1)(a) Identify the notional "person skilled in the art".
> (1)(b) Identify the relevant common general knowledge of that person.
> (2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it.
> (3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed.
> (4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

At the hearing, EPAI asserted that the assessment requires an understanding of what amounts to "invention," with this introduced above in the discussion concerning the intermediate step, before being able to assess inventive step. The issues are distinct but closely related. EPAI argued that objectivity *might* be served by the inclusion of a further "rider" as a new guidance step 2A. The proposed rider reflected a high degree of correspondence with the language in *G1/19*, and was expressed thus:

> 2A. When considering a mixed invention, the assessment of inventive step must take into account of all those features which contribute to the technical character

> of the invention and exclude all those features which do not contribute to the technical character of the invention. Whether non-technical features contribute to the technical character of the invention has to be assessed in the context of the invention as a whole.

The Supreme Court did not feel the need expressly to include the proposed 2A rider, but it endorsed the need to assess all interactions between all appropriate claim features when taking the invention as a whole. In this regard, the court emphasized the directions provided in *T0154/04-Duns,* which regardless appears substantially to equate to the 2A rider.

Turning to *Duns Licensing* and its role within the EBA's *G1/19* decision, the reasoning in *Duns* was approved by the Enlarged Board's adoption, word for word, of seven principles set out in that decision ("the *Duns* principles") (see [37] to [39]). With some clarifying remarks and/or some truncation for this article, Duns makes several salient points.

- Firstly (A), it established that there must be an invention and that such an invention must satisfy the four requirements of patentability set out in Art.52(1) EPC - invention, novelty, inventive step and susceptibility to industrial application.
- Secondly (B), an implicit requisite of an invention is that it should have technical character or "technicality", and the requirement of technical character in an invention is an absolute requirement that does not imply any novel and inventive contribution relative to the prior art.
- Thirdly (C), Art.52(2) EPC does not exclude any subject matter having technical character even if it is related to any of the (non-technical) items specified in Art.52(2) EPC, since these items are only excluded "*as such*" by Art.52(3) EPC. In the decision at [36], the Supreme Court emphasised this point by referencing the EBA, "In fact, a purely excluded (non-technical) matter can count as a contribution to the technical character of an invention. It is only to the extent that non-technical features do not interact with technical features to produce a technical effect that they cannot establish novelty or inventive step."
- Fourthly (D), the four requirements - invention, novelty, inventive step, and susceptibility of industrial application - are essentially separate and independent criteria of patentability.
- Fifthly (E), for examining patentability of a claimed invention, the claim must be construed to determine the features which contribute to the technical character of the invention.
- Sixthly (F), in a mixed invention of technical and non-technical features, it was recognised that non-technical features may form a dominating part of the claimed subject-matter. Non-technical features, to the extent that they do not interact with the technical subject matter of the claim for solving a technical problem – however formulated - do not provide a technical contribution.

The final seventh point (G) of Duns was dismissed (see [66]) because it is not relevant to the UK *Pozzoli* test, Principle (G) relates to the EPO problem-and-solution approach, namely that the problem must be a technical one, although such a technical problem may be formulated using an aim to be achieved in a non-technical field, e.g., by defining a constraint that has to be met.

So, what is the form of the guidance to be applied to *Pozzoli*?

The salient point on inventive step assessment is expressed by the UKSC at [65] and [66] and relates to the need that features must contribute to the technical character of the invention. It is significant and produced *verbatim* below (with emphasis added):

> The question remains: what method, approach or guidance should this court provide by way of replacement? We have already made it clear that this should not be what the Comptroller General has labelled "any hardware" + *Comvik*, if by that is meant everything in *Comvik*, including its guidance on how to carry out the problem and solution method when assessing inventive step. It was perfectly understandable that the Board in *Comvik* should have given that guidance, and that the Enlarged Board approved it in *G1/19*, because the problem and solution method of assessing inventive step was already well-established in the practice the EPO. But it is a matter of practice rather than something dictated by the EPC on its true interpretation. Subject to an irrelevant exception relating to certain documents, all that the EPC tells you about how to decide whether the claim involves an inventive step is (in article 56) that a step is inventive if it is not obvious to a person skilled in the art. **We see no reason to doubt that, as confirmed by this court in *Actavis v ICOS,* the approach to inventive step laid out in *Pozzoli* remains a legitimate approach**.
>
> In our view, **the approach which should be adopted by courts in the UK is that contained in the *Duns* principles other than principle G (and the second paragraph of the *Comvik* headnote), as explained by the further reasoning in *G1/19,* in particular about the need for an intermediate step between "any hardware" and inventive step to determine which features in a "mixed" invention contribute to its technical character: see again para 39 of the Board's reasons**. This is for the purpose of excluding non-technical features (ie features which do not contribute to the technical character of the invention) when assessing at the next stage whether the invention involves an inventive step in relation to the prior art.

This is significant for inventive step and will result in revision of the MOPP as supplemented by earlier notification that any hardware is now to be applied.

A claim to any interaction contributing to a technical solution in the context of the invention when viewed "as a whole" is the gold standard, and it is likely to persist for a considerable period. This requires objective thinking on the part of both the practitioner and the examiner, so hopefully context will now prevail, and fewer refusals will be issued by UKIPO examiners based on superficial invention assessment.

What is a Computer and a Program for a Computer?

We now have revised definitions for both a computer and program for a computer. The judgement is a mixed bag of news; mostly very good but some potentially not so good. In the latter respect, referring to my current favourite word, it may however be possible for a commodore – or at least a captain of industry - to steer a path through some choppy waters.

The court acknowledged that the definition of a computer provided by the Court of Appeal in ***[2024] EWCA Civ 825*** was "overly broad" (see [76] and [96]) since it overlapped the term "computer" with older technologies that were always patentable. In this respect, it decided that:

> a ***computer*** is 'a machine which processes information through performing computations',…
>
> "what characterises a computer as a physical machine is its functionality, not the specific technology used to achieve that functionality."

I use single inverted commas for this definition because this is what I derive from reading [76], and no contiguous run-of-words definition is given anywhere. The court merely says:

> "What differentiates them from a "computer", as that term is ordinarily used and understood, is - as it seems to us - that they are not used to perform computations."

In contrast, the statutory language for a ***program for a computer*** is provided at [79], explicitly:

> "the description of a "program" must be correspondingly broadened to include a set of instructions capable of being followed by a computer (of any kind) - which may or may not have a CPU - to produce desired manipulations of data."

The court [77] justified its position about what amounts to a computer, whether with a CPU function or not, saying that the language of the Act should not be restrictive and interpreted in such a way as to apply a definition that prejudices evolving technologies, such as quantum computers, or to reject analog computers. Does this make a nonsense of what amounts to a program in the context of ubiquitous computers and computing and the interpretation of these terms from a technical perspective? And what now amounts to "performing computations?"

The entirety of a deck of computer punch cards and tapes - of the 1960s and 1970s - defined any program. It should also be appreciated that, at the point of drafting the '77 Act – and even today - analog computers had no CPUs and were/are simply circuits. Justification for generalisation of the term "computer" may possibly reflect a misunderstanding of difficult technology and/or legal abstraction potentially disconnected from practical technological reality and the impact of the revised definition, but one unfortunately must presume not. For example, a quantum computer has some form of CPU; yes, albeit referred to as a QPU. Digital and quantum computers consistently make use of register entries for bit storage in their delivery of a functional output that follows a program, whereas analog computers do not. And where is the program in an analog computer and what components process information through performing computations in such an analog computer? It seems that these components and functions can only be physical electronic components and their characteristic parameters, i.e., physical properties with ascribed values.

It is fully understandable for a computer program to translate from one language to another or to construct code to fulfil a function by selecting known modules from a library. However, if the underlying function is itself unknown and that function delivers a new technical advantage (as in the case with the concept of embedding space convergence and the ability of the final system to operate on "objectively measurable physical properties of the files" [12]), then where does the prior computer and its program even start to find a solution? It cannot because there are no defined constraints, there is no understanding and there is no guidance (even for an

ANN)! Quoting the decision, it is not even necessary for the programmer "to understand the significance of its individual parameters" for the weighting factors of neuron in the ANN. Yes, but this appears to miss the point about how a neural network is conceptually developed and then assembled! And to say, "We agree with the Court of Appeal that there is no justification for drawing a distinction in law between instructions created by a computer and those created by a human being. Once this is recognised, it cannot make a difference what particular method is used to program a computer to generate instructions which themselves constitute a computer program," is to a degree right, but it is also seemingly misguided if not wrong because it misses the spark of invention from an inventor and their conceptual input to a technical solution.

What is an ANN?

At [75], the decision reports/states that an "ANN is generally regarded in the computing field as akin to a function." This may have pointed the justices to pursue a line of thought that was unnecessary and compromising. The EPO guidelines do, however, describe an ANN as a "computational model" in the context of applying the EPC's mathematical exclusion, but this does not necessarily hold true for supervised learning and contextual learning objectives when considered "as such." The EPO's prevailing classification of neural networks, at its TBA level, is by no means fully tested and explored, with the ***T702/20-Mitsubishi/Sparsely connected neural network*** decision turning on specific facts dictated by the way in which its invention was claimed.

The judgment says that an ANN is "not itself a computer (which is a physical object) and the Court of Appeal was [84] "mistaken in describing it as such."

The justices did not accept the argument that "there is no series of instructions stored or executed anywhere in the system, and no coded command instructing any part of the computer (let alone a CPU specifically) to execute any particular logical function." The fact that an emulated ANN is realised in software and run on a conventional computer seems to be at reasoned odds with the conclusion reached that "since the only way in which a conventional computer can operate is by utilising a CPU to read and execute a series of coded instructions, the very fact that an ANN can be implemented on a conventional computer shows that the assertion must be wrong." Does this not fail to reflect the functional result achieved by the code and its real-world effect, and that the underlying technical methodology and resultant function - rather than the form of implementation - is important? This observation is clearly in conflict with the decision, but then nagging concerns may exist that, upon returning to technical first principles, a different legal conclusion might be reached. At the end of the day, the Patents Act is concerned with technology and technical invention "in all fields of technology," so has justice truly been served by this finding?

The court said, in the context of an ANN (see [86]) that "data presented as an input is processed in a particular way by computations performed on the data as it is propagated through the network until it produces an output," but does that not also apply to numerous other electronic devices, including analog computers? What is information? An analog signal contains information albeit not in a digital form of logical 1s and 0s. Any circuit, and particularly the components within that circuit forming an analog computer, would seemingly therefore constitute [87] "in essence, a set of instructions to manipulate data in a particular way so as to produce a desired result." This is potentially concerning. Analog computers can be/are

computational units, but the bottom line appears to be that analog computers do not really *execute* instructions of a program. Rather, they are static constructs through which electrical signals flow. They do "process" information as a consequence of the physical attributes, e.g., resistance or capacitance, of components, including within operational amplifiers.

An ANN was found [23] to be a program for a computer, according to the judgement, because "conceptually, they are a set of instructions to a computer to carry out computations," but what differs from a circuit which processes data and what amounts to a computation? Again, this appears to be just an arbitrary distinction potentially based, with respect, on generalised thinking that did not consider wider implications for the definition.

A rhetorical statement and answer from the court appears at [86]:

> "What then is the relationship of an ANN to a computer? We think it apt to describe the machine on which an ANN is implemented as a computer."

The court concluded [80] that an ANN is an abstract entity, ignoring that irrespective of a hardware or emulated realisation that the neurons have fixed values and are a network of components and a network that is "an abstract entity or model" [81]. In fact, in the general sense of a computer, the manipulation of data by a program may not result in any predictability in the output, albeit that such data manipulations are determined by instructions. The decision further found that the network "is not a physical object" and, because it was not itself a computer, it was not helpful that the CoA described it as "a hardware ANN as a physical box with electronics in it." The court suggest that the Hearing Officer was therefore correct to describe an ANN as:

> "an abstract model which takes a numerical input, applies a series of mathematical operations (applying weights, biases and an activation function) and outputs a numerical result at successive layers," and
>
> "a set of instructions to manipulate data in a particular way so as to produce a desired result."

This seems questionable because, without any supporting hardware structure, an emulated ANN is not realisable. So, does the judgment miss the issue and generalise, potentially cause problems? It seems that the definition of what amounts to a computer in the context of the Act – and the ramification of the definition – potentially may not have been extrapolated, but we must presume that it was appreciated in the justice's deliberations. Regardless, 'it is what it is' and we will collectively need to work with these issues and the definitions. The point is made here that, in January 2025 and after the Court of Appeal decision, the UKIPO felt it necessary to amend the MOPP to reflect that the definition of the term "computer" has implications for existing technologies, including application-specific integrated circuits "ASICs":

> **1.35.2** Whether the program for a given computer is fixed in a permanent form or not is also not relevant (Emotional Perception, at [67]). Therefore, 'hard-wired' computers such as application-specific integrated circuits (ASICs) are considered to be computers and the computer programs stored thereon are to be assessed for exclusion in the same way as any other computer program.

> **1.35.3** It follows that other types of computer (e.g. neural networks, analogue computers, quantum computers, etc.) are to be considered as computers for the purposes of the exclusion, and their programs are to be assessed for exclusion in the same way as any other computer program.

Technically, considering the equivalence of hardware and an emulated ANN solution, a neural network is a "network" of fixed components - as the final "N" of the acronym demands - and is a product implemented on a CPU, GPU, ASIC or the like. But then again, so is a digital filter. The interventions, as reflected in the decision, helpfully did assert that an ANN was not itself a computer, nor could the weighting factors associated with frozen neurons be considered to be a program, but this seems generally to have fallen on deaf ears. For sure, the technology in EPAI's application, relating to ANNs and an application within AI, is conceptually difficult and requires a deep understanding.

EPAI argued that a computer should reasonably be understood to require some form of central processing unit "CPU" and an interaction of data into and out of registers; this corresponds to both the Harvard and von Neumann computer architectures of the 1940s and later. Both are taught to children in A-level/pre-university computer science courses. A quantum computer also has a processor, but it operates and moves QUBITS (rather than logical 0 and 1 bits), shifting from deterministic, sequential processing to probabilistic, parallel computation. Consequently, a definition to reflect this – ignoring a spurious statement about whether processing is carried out serial/stepwise or in parallel – would have been seen to be consistent with technology from the 1970s (when the Act was drafted) as well as in the past and future. This statement steers away from what amounts to an analog computer. EPAI submissions did not significantly reference the [scant detail in the] preparatory papers for the UKPA or EPC, but rather is/was based on logic, reason and functional technical understanding.

Some final points on the program issues, at [92] and [93], the UKSC said that serial or parallel processing is irrelevant. That has been true for decades, but the point that it related to was concerned with interactions within a CPU and how a computer goes about executing a program.

As a final observation on neural networks and their applications in AI systems, the conceptual issues on which they are built - for example "the learning objectives" in supervised learning – are not machine generated but reflect human ingenuity at their core. At this point, AI is far from being a fully cognitive and free-thinking machines, with this presently evident from the generation of hallucinations by such systems. To provide context in the claim before the court, how did the alleged "program" arrive at the concept of separation distance convergence between semantic and physical embedding spaces? The ANN implemented the conceptual idea but did not self-generate the concept and did not foresee the related advantages. An applied mathematical process in so-called backpropagation, implemented in a computer environment, ultimately determines the weighting factors for the neurons. But this is a subordinate and applied role required to implement higher level human thought processes within an ANN.

Observations and Food for Thought

Some of the next statements are pure conjecture and some observational, but they may assist in future lines of argument.

The finding (see [22] and [23]) that an ANN is a program and not a mathematic method follows from the Court of Appeal and the neuron weight aggregation argument. It may also be necessitated by a need for some level of alignment with the EPO, not least because the UKIPO failed at first instance to argue that the mathematical method "as such" exclusion applied. This perhaps followed from the UKIPO Hearing Officer's finding, at [78] of BL O/542/22, that it did not:

> "it is only the application of the computer program exclusion which has thus far been held to prevent the grant of the sought-after patent….
>
> ANNs of the kind with which this appeal is concerned (including therefore the ANN which is the subject of the claims) are "programs for computers" within the meaning of article 52(2)(c)…"

Consequently, with commentary from the CoA only *obiter dictum*, the mathematical method rejection was not fully developed at any time as a ground for potential rejection. The decision to refer to an ANN as a computer program and a "computational model" (see [81]) and "abstract entity" might therefore represent attempts at general alignment with the EPO's position on the treatment both of ANNs [as a standalone entity] and their training. Clearly, the second statement is conjecture. Technical implementation of an ANN is arbitrary as to the choice between hardware and software [per ***T208/84-Vicom*** and at [6]], but the boundary appears to have been blurred in order to find some form of alignment with the EPO's present assertion that an ANN is a mathematical method Certainly, an ANN makes use of some applied mathematical processes and an emulated ANN makes use of some applied program for assessment of the "cost function" to quantify residual error in its prediction, but that does not necessarily mean that there is not patentable innovation at a different level of generality. Regardless, the assessment of the nature of an ANN by the UKSC now differs from the assessment by the EPO.

With AI/ANN technologies, patentability generally turns on whether there is an appropriate application that supports a fundamental technical process to achieve a technical effect. It should also turn on assessment of the claimed invention at the correct level of generality. What really amounts to an ANN, its training and its effects in the real world are all questions that the EPO has not addressed.

Only at the Court of Appeal did the UKIPO introduce the argument that computers, under the Act, could also be analog. That was the UKIPO's prerogative. However, analog computers are simply circuits without a processor (as discussed above), and where is the program that would engage the statutory exclusion? Analog computers have always been protected as circuits, so why does the Act and EPC expressly recite a "program for a computer" as being excluded "as such", whilst not mentioning a need to consider or preclude functionally equivalent analog circuits? Perhaps the reason is that the legislator appreciated that analog computer have no program. Consequently, it seems that a more appropriate and tighter definition could have been provided for the term "computer," as was argued by rejected by the court.

The definition of a computer and its dependent program still has potential problems, for example, for a digital filter and other functional – dare I say analog or other - circuits. As an example, a digital filter appears directly analogous to an ANN, namely it processes and

manipulates data, based on computations and program steps, to provide a functional output. As validation for this statement, I suggest that the reader reformulate this statement as a question into an LLM or technical expert to see what they say, but I fear it will not be good.

Why should the acronym ANN – a network of interacting components in an easily understandable hardware sense – be treated differently to a digital filter. The terms "ANN" and "filter" are merely labels applied to a piece of technology. The label does not look at what it functionally achieves or how it is technically realised. So, does arbitrary distinction remain simply because ANNs are associated with a slightly different contextual environment and are usually part of a larger machine? If the underlying technology for a digital filter and an ANN is a computer, is there a difference? Is this form over substance, or is it that ANNs are receiving prejudice and arbitrary treatment? And would *Vicom* now still hold true under the same definition and the updated guidance on inventive step?

One perhaps also should consider the reasons why ***Gale's Application*** **[1991] RPC 305** was rejected and cited by the UKSC. Was Gale's claim language sufficient, was the reasoning entirely sound (see [90]) and would its final legal outcome be decided differently under any hardware and the updated guidance requiring consideration of appropriate interactions between contributing features? That I can leave for argument on another day.

With the rejection of *Aerotel*, do the *Signposts*, derived from ***AT&T Knowledge Ventures/CVON v Comptroller General*** **[2009] EWHC 343** and as used by the UKIPO to determine whether a computer-implemented invention or software makes a technical contribution in the context of *Aerotel*, still have any role to play? For reference, the five signpost are:

1. Does the technical effect occur outside the computer?
2. Is there an architectural improvement to the computer?
3. Does the computer operate in a new way due to the technical effect?
4. Does the program make the computer function better or more efficiently?
5. Does the invention solve a perceived problem, rather than merely circumventing it?

Given the decision, I propose the question is whether or not an ANN function – claimed as a piece of hardware - can embody the concept of a "better computer" and be patentable for these reasons?

Additional questions that arise naturally from this section are these:

1. Does the aggregation of neuron weighting factors – the weights and biases – actually amount to a set of instructions required in the updated definition of a program?
2. Whilst unimpeachable, was the decision to find that they do right?

Finally, if the statute has always meant that the term "computer" includes analog computers, have the courts and patent office been misapplying the definition for decades and favourably granting patents when they should not? This thought is perhaps the most concerning point.

Practical Considerations and a Possible Escape Plan

My commentary above on the potential problems may, returning to a nautical theme, 'be a storm in a teacup.' The Supreme Court said [38], albeit in the context of statutory exclusion, citing *G1/19*,

> "a claim directed to a computer-implemented invention avoids exclusion under Art 52 EPC merely by referring to the use of a computer, a computer-readable storage medium or other technical means".

The escape from this patentability trap appears to be the application of "any hardware" and a subsequent consideration of the function and interactions of the invention considered as a whole. It is then a question of understanding the true nature of the invention. Considered claim drafting and wordsmithing is required. Development of precise feature interactions are also required in describing the invention and its impact in the real world.

Opportunities

With the sea-change in practice, my final observations relate to client filing strategies.

Certain technologies have a more limited commercial shelf-life. This reflects the "creative destruction" paradigm of the 2025 Nobel Prize in Economic Sciences. As an example, in the telecommunications and electronics spheres, unless the technology is disruptive and/or incorporated into a technical standard, one might venture to suggest that, historically, patented technology is replaced, on average, every 5-7 years (give or take). AI innovation is reducing that timeline.

The prior negative impact and application of *Aerotel* has not gone unnoticed and, I reasonably suggest, has encouraged a regional filing strategy via the EPO rather than direct filing at the UKIPO. This comes at a cost of time and money. The EPO official fees, including renewal costs, are not cheap. Indeed, they are relatively expensive when compared to those of the UK and include mounting annual renewal fees. Furthermore, ignoring PACE and centralised opposition, the time to acquire an assertable national patent right via the EPO is, again on average, considerably longer than the UK's statutory section 20 UKPA compliance period and the operation of Rule 30 Patents Rules, essentially 4½ years without taking into consideration extensions and other triggers.

Would an optimised filing strategy not therefore suggest filing patents in parallel at the UKIPO and the EPO, or otherwise targeting specific national countries with developed and workable legal systems to reduce costs? For relatively short-life patented technology that is or is likely to be infringed, recourse to the UK courts could represent a fast and commercially favourable result. Any subsequently issued EP patent might be structured to mop up either broader protection or other national pieces. Having a standalone UK patent would, in any event, complement a unitary patent given that the UK is not covered by such a unity "UP" patent.

Earlier UK grant would also substantiate patent values to businesses, whilst further aiding SMEs and individuals in their pursuit of venture capital funding or asset disposal, including company acquisition.

Conclusions

One of the major hurdles of acquiring national UK rights – *Aerotel* – has now been removed through the move to "any hardware." Two other tenets of patentability have been qualified with express guidance. The guidance stipulating consideration of the invention "as a whole," and the requirement to consider feature interactions in obviousness assessment are both of major significance.

The reach of the decision is not restricted to AI, computing and electronics, but extends to other technology areas. The influence of this decision from the UK Supreme Court, given its international standing, is likely multi-national, especially in Commonwealth countries in which "as such" is a condition for exclusion.

Whilst the decision is highly positive for the professional and UK plc, there are aspects that may still require some thought and careful navigation.

Biography

Bruce C. Dearling acted as instructing attorney before the UK courts, representing Emotional Perception AI. He is a shareholder at Hepworth Browne and responsible for CIIs, AI, communications, and business technologies. He has over 35-years of private practice and industrial practice experience both in the UK and internationally and is multi-nationally qualified. His previous work has secured leading decisions in litigation in Germany and other European countries, including for trade secret and database theft and cross-border evidence seizures at and before multiple Courts of Appeal and Supreme Court instances.

