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Computer-Implemented Inventions

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Dr Parminder Lally, CPA, EPA

Innovation │ Branding │ Strategy │ Solutions

Why do you need to know about CIIs?

Because you want to be a patent attorney!

You need to know this for the exams, but also in real life so you can advise your clients thoroughly

- Syllabus for FC1 states that you need to know:

PEB Foundation Certificate
UK Patent Law FC1 (P1)

	Content (IPReg Patent topics)	Learning Outcomes	Patents Act 1977	Patents Rules 2007
1	The law relating to patentable inventions in the UK (Requirements for patentability, novelty, inventive step, subject matter)	a) Define the requirements for a patent to be granted on an invention, including: • novelty • inventive step • industrial applicability • exclusions to patentability b) Describe the available patent protection for methods of treatment or diagnosis and biotechnological inventions c) Explain whether a document is prior art d) Apply (a) to (c) to a scenario	PA 1 – Patentable inventions	
			PA 2 – Novelty	PR 5
			PA 3 – Inventive step	
			PA 4 – Industrial application	
			PA 4A – Methods of treatment or diagnosis	
			PA 76A and PA Schedule A2 – Biotechnological inventions	

& UK case law and how to describe the facts of and legal principles established by the leading cases. (Currently, no cases on excluded matter are on this list.)

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Because you want to be a patent attorney!

You need to know this for the exams, but also in real life so you can advise your clients thoroughly

- If you are going to be working on software/CII cases, you'll need to know the law, including the leading cases.

- If you aren't, you *still* need to have knowledge of this area, so you can call in help from experts for the benefit of your clients.

  - Many inventions are multi-disciplinary now, so it may pop-up in your area.

  - E.g. AI-powered drug design, autonomous control of manufacturing processes and vehicles, energy system and usage management, banking, healthcare and diagnosis methods, etc.
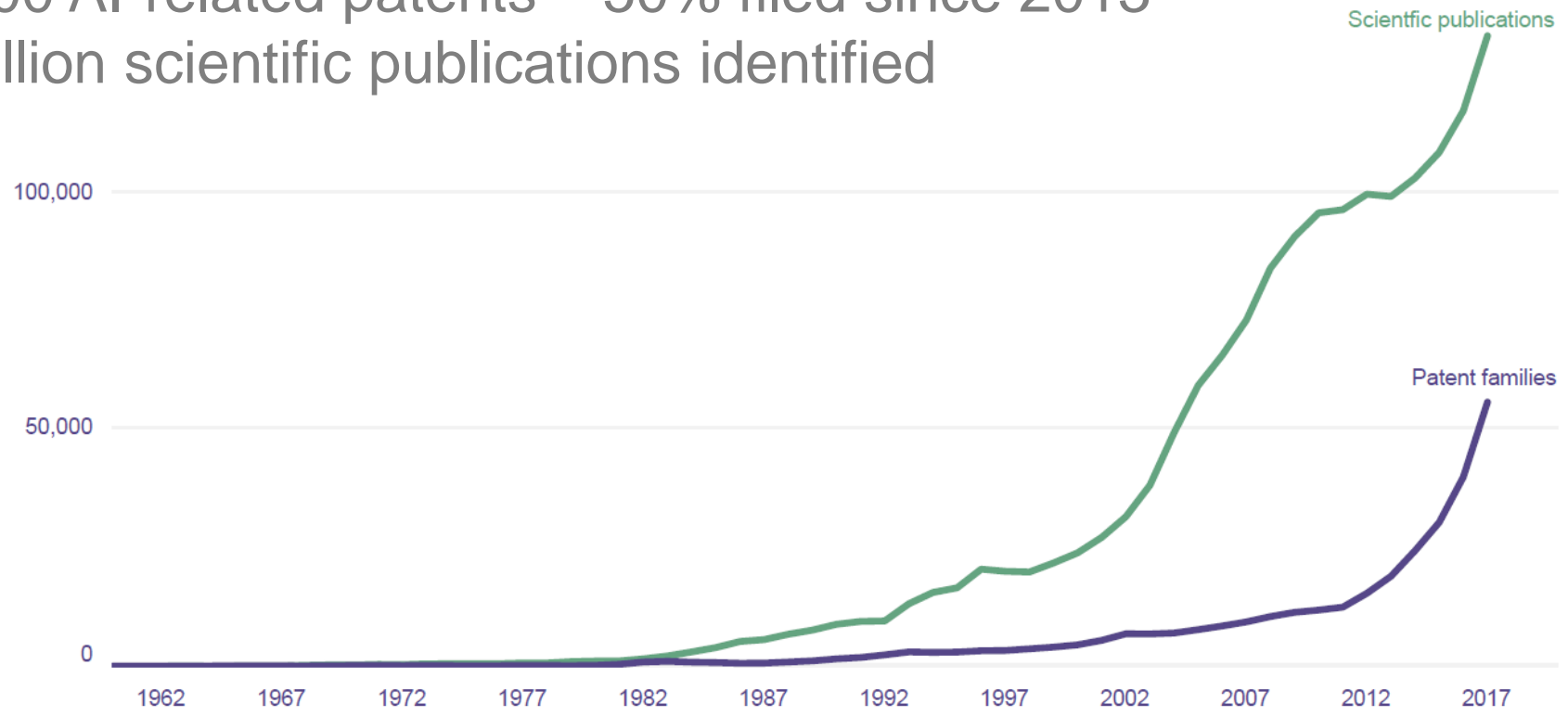
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Do companies patent software?

SECTION 1

Trends and reasons

Yes, they do!

Covers patents & scientific publications – 1950s to 2016

- 340,000 AI-related patents – 50% filed since 2013
- 1.6 million scientific publications identified

https://www.wipo.int/edocs/pubdocs/en/wipo_pub_1055.pdf

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Criteria for patents: UK

Exclusions from patentability

Section 1(1) UK Patents Act 1977

▪ *A patent may be granted* **only for an invention** *in respect of which the following conditions are satisfied, that is to say*

  a) *the invention is new;*
  b) *it involves an inventive step;*
  c) *it is capable of industrial application;*
  d) **the grant of a patent for it is not excluded by subsections (2)** *and (3) or section 4A; and references in this Act to a patentable invention shall be construed accordingly.*

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Exclusions from patentability

Section 1(2) UK Patents Act 1977

▪ *It is hereby declared that the following (among other things) are **not inventions** for the purposes of this Act, that is to say, anything which consists of -*
  a) *a discovery, scientific theory or **mathematical method**;*
  b) *a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever;*
  c) *a scheme, rule or **method for performing a mental act**, playing a game or **doing business**, or a **program for a computer**;*
  d) *the presentation of information;*

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

"Among other things"

Sec. 1(2) UKPA - not an exhaustive list

- The phrase "among other things" suggests other things may also be excluded from patentability.

- The Manual of Patent Practice outlines a couple of things which have also been considered excluded, even though they do not map onto the specific listed categories.

    - E.g. a method of developing a golf swing without a club

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"As such"

Sec. 1(2) UKPA – prevents you from protecting the excluded thing in that form

- These two words are quite important! They tell us that the excluded things are those things in a *literal* sense.

- For example, "computer programs" are not patentable, if you consider programs to be the *literal* code. But the <u>functions</u> performed by a computer program may be patentable.

  - The literal code is protectable using other IP rights, e.g. copyright.
  - Just because a claim involves the use of a computer program or a computer does not automatically mean it is excluded from patentability.

- Similarly, a new equation or mathematical technique is not patentable on their own. E.g. you couldn't patent Newton's second law, but you could protect a use of that law.

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Examples

- Mathematical methods and scientific theories
  - ✖ Models and algorithms
  - ✔ Use of models/algorithms for specific purposes e.g. audio analysis, controlling robots, image processing…

- Aesthetic creations
  - ✖ Artwork produced by AI
  - ✔ AI method to check authenticity of an artwork

- Mental acts, methods of playing games or doing business, programs for computers
  - ✖ AI for financial predictions or pricing models
  - ✔ Programs for implementing security in financial transactions, or for controlling memory allocation

- Presentations of information
  - ✖ AI to determine how to layout information on website to get user to buy products
  - ✔ Image analysis techniques

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Important cases in the UK

The law is quite settled, but there are several key cases

- Merrill Lynch – Merrill Lynch's Application [1989] RPC 561

- Gale's Application – Gale's Application [1991] RPC 305

- **Aerotel/Macrossan** – Aerotel Ltd v Telco Holdings Ltd & Ors Rev1 [2007] RPC 7

- Symbian – Symbian Ltd's Application [2009] RPC 1

- **AT&T** – AT&T Knowledge Ventures/Cvon Innovations v Comptroller General of Patents [2009] EWHC 343 (Pat)

- Halliburton – Halliburton Energy Services Inc's Applications [2012] RPC 129

- HTC v Apple – HTC Europe Co Ltd v Apple Inc [2013] EWCA Civ 451

- **BUT** this *could* change some things! – Emotional Perception AI Ltd v Comptroller [2023] EWHC 2948 (Ch)

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Aerotel/Macrossan

Defines a test often referred to as the "Aerotel test"

- The test provides a framework to assess the issue of excluded matter – it is used by:

  - the UK IPO,
  - by the Courts, and
  - by us patent attorneys to advise our clients as to whether they could protect their invention using patents.

- Important to note that this test applies to **all** the excluded things! Not just for computer-implemented inventions.

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Aerotel/Macrossan

Defines a test often referred to as the "Aerotel test"

- The test has four steps:

    1) *Properly construe the claim;*

    2) *Identify the actual contribution;*

    3) *Ask whether it falls solely within the excluded subject matter; and*

    4) *Check whether the actual or alleged contribution is actually **technical** in nature.*

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Aerotel/Macrossan – Applied to CII

How do you work out the technical contribution?

- The judgment in Aerotel/Macrossan does not provide guidance on how to determine whether the contribution of the invention is technical (i.e. step 4).

- There are now five signposts, often referred to as the **AT&T signposts**, to help with step 4.

- The five signposts are not exhaustive and are merely guidelines.

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AT&T Signposts

The decisions that each signpost derives from are in brackets.

*(i). whether the claimed technical effect has a technical effect on a process which is **carried on outside the computer** (from Vicom)*

*(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 (from IBM T 0006/83, IBM T 0115/85, Merrill Lynch, Symbian)*

*(iii). whether the claimed technical effect **results in the computer being made to operate in a new way** (from Gale)*

*(iv). whether the program **makes the computer a better computer** in the sense of running more efficiently and effectively as a computer (from Vicom, Symbian; as reworded in HTC v Apple)*

(v). whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented (from Hitachi T 0258/03)

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Some examples of how it appears

Example 1 – claims searched and examined, but the UK IPO flagged the issue

Excluded subject matter – Section 1(2)

18.   Given that the current invention concerns machine learning, it can relate to excluded subject matter (see updated section in the Manual of Patent Practice, 1.29.5, 1.39.3). The corresponding assessment would require identifying the actual contribution compared to the prior art. This could be more appropriately done when the claims are new and inventive over cited prior art given that at this stage identifying what the contribution is would be rather speculative. I have therefore deferred full assessment of compliance with section 1(2) until the claims are new and inventive.

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Some examples of how it appears

Example 2 – claims not searched at all

Excluded subject matter – Sections 1(2)(c) and (d)

1.	Your proposed invention relates to a program for a computer as such and the presentation of information as such. Your proposed invention is therefore excluded from patentability under Sections 1(2)(c) and (d) of the Patents Act 1977.

2.	In *Aerotel*[1] the Court of Appeal set out the following four-step test for determining whether a proposed invention is excluded under Section 1(2):

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

3.	In *Symbian*[2] the Court made it clear that when determining whether a proposed invention is excluded, the question "is the contribution technical?" must be asked, but that it does not matter whether it is asked at step 3 or 4. I will consider steps 3 and 4 together.

Step 1 – Properly construe the claims

Emotional Perception case

Worth keeping an eye on if you work in the AI space!

- https://www.bailii.org/ew/cases/EWHC/Ch/2023/2948.html

- UK IPO considered an invention that involved an artificial neural network (ANN) to fall solely with the computer program exclusion.

- The Applicant appealed the UK IPO's decision, which lead to the High Court reviewing the case. The HC Judge said that since the application mentioned that the ANN could be hardware or software, then the exclusion could not apply.

- Also said that a claim directed to training an ANN has a technical contribution, i.e. a trained ANN is output. This could be hugely significant for the AI field, as up until this judgment, methods to train AI were usually excluded.

- Watch this space! The HC decision is being appealed, so the situation is in flux.

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Criteria for patents: EPO

Exclusions from patentability

Art. 52 EPC

1) European patents shall be ==**granted for any inventions**==, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.

2) The following in particular ==**shall not be regarded as inventions**== within the meaning of paragraph 1:
    a) discoveries, scientific theories and ==**mathematical methods**==;
    b) aesthetic creations;
    c) schemes, rules and ==**methods for performing mental acts**==, playing games or ==**doing business, and programs for computers**==;
    d) presentations of information.

3) Paragraph 2 shall exclude the patentability of the subject-matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities ==**as such**==.

How is Art. 52(2) EPC applied?

In practice, it isn't! Instead, the EPO uses Art. 56 EPC to object to claims

- The exclusion does not apply to computer programs having a technical character.

- To have a technical character, a computer program must produce a "**further technical effect**" when run on a computer, which goes beyond the normal physical interactions between a program (software) and the computer (hardware) on which it is run.

- Because the EPO is considering what the technical effect is of the computer program, the EPO rarely objects to a claim falling foul of Art. 52(2) EPC, but instead makes an assessment under Art. 56 EPC (i.e. inventive step).

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Example of how it appears

2.1.4 The above notwithstanding, these distinguishing features are of a non-technical (mathematical) nature and they can only be seen as contributing to the solution of a non-technical (mathematical) problem, the one of training a machine learning model using labelled and unlabelled data. The mathematical method to which they belong does not serve a technical purpose because it is neither applied to a field of technology, nor adapted to a specific technical implementation. They cannot, therefore, contribute to producing a technical effect that would serve a technical purpose. Hence, these distinguishing features do not make a technical contribution over D1 and cannot support the presence of an inventive step (Art. 56 EPC).

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Is there an equivalent to the Aerotel test?

No, but the EPO Guidelines for Examination provide lots of examples to help

▪ Guidelines G-II, 3.6.1 – Examples of further technical effects

▪ The examples are very similar to the five AT&T signposts:

  ▪ E.g. if the program controls an external system like a braking system in a car – c.f. signpost (i)

  ▪ E.g. if the program controls the internal functioning or operation of a computer – c.f. signposts (ii) to (iv)

▪ See also the index in the Guidelines for CIIs: https://www.epo.org/law-practice/legal-texts/html/guidelines/e/j.htm

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Criteria for patents: US

Exclusions from patentability

35 U.S. Code 101

*Whoever invents or discovers any new and useful **process, machine, manufacture, or composition of matter**, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.*

- This is inclusive rather than exclusive (c.f. UK and EPO).

- It is very broad, and so for a long time, it used to be that you could patent "anything under the sun" in the US!

- Until 2014…

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Alice Corp. v. CLS Bank International

US Supreme Court decision in 2014 on patent eligibility

- Alice Corp. owned patents on electronic methods and computer programs for financial-trading systems.

- Alice alleged CLS Bank infringed the patents; CLS Bank said the claims at issue were invalid.

- There had already been a Supreme Court decision on patenting business methods (Bilski v. Kappos, 2010). The claims in this case were considered patent ineligible because they were directed to the **abstract idea** of hedging against risk.

- The Federal Circuit court wanted to know what test should be used to determine whether a computer-implemented invention is a patent-ineligible abstract idea, and whether the presence of a computer in a claim could turn something patent-ineligible patent eligible.

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Alice Corp. v. CLS Bank International

Exclusions or exceptions to patent eligibility now exist

- The Supreme Court looked at another SC decision – Mayo v. Prometheus – a biotech/pharma case in which it was held that an abstract idea could not be patented merely because it is implemented using a computer.

- 35 USC 101 states what categories of invention are patent eligible.

- The courts have interpreted this to mean the following are excluded:

  - laws of nature, natural phenomena, and **abstract ideas**.

- These are known as the "judicial exceptions".

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Alice/Mayo ~~three~~ two-step test

Used by the USPTO and the US courts

- *Step 1: Is the claim to a process, machine, manufacture or composition of matter?*

- *Step 2A: Is the claim directed to a law of nature, a natural phenomenon, or an abstract idea?*

- *Step 2B: Does the claim recite additional elements that amount to **significantly more** than the judicial exceptions?*

  - If answer to Step 1 or 2B is no, then claim is directed to patent **ineligible** matter.

  - If answer to Step 2A is no, or to Step 2B is yes, then claim is directed to patent eligible matter.

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USPTO produced guidance to help

Law is more settled now, and UK/EP approach helps in the US

- There are examples and guidance here: https://www.uspto.gov/patents/laws/examination-policy/subject-matter-eligibility

- In 2019, the patent subject matter eligibility guidance was revised and updated, and now the "two-step" test has even more steps! https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf

- Step 2A in particular now includes a sub-question (prong two) on whether the claim recites **additional elements that integrate the judicial exception into a practical application**.

- Essentially, a technical effect type analysis, such as the one we use at the EPO, can help

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CII drafting

Key considerations – claims

Don't forget infringement!

- Claims for CIIs may be:

  - A method for… comprising:
  - A computer-implemented method for… comprising:
  - A system…
  - An apparatus…
  - A computer-readable storage medium …

- Think about whether any steps of a method are being performed by different devices. E.g. server or client devices, receiver or transmitter, encoder or decoder.

- Cover the steps performed by different devices in separate claims, in view of who might infringe.

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Key considerations – description

Remember all the other bits of law when drafting too!

- Avoid using words that may accidentally cause a Patent Office Examiner to think the invention relates to excluded subject matter, e.g. "this reduces costs…

- Sufficiency of disclosure is important for CIIs, and is not just a biotech/pharma/chem issue!

  - Need to sufficiently describe the CII, particularly AI/ML inventions.

    - How is the model trained, what datasets are used for training, what is the model architecture, what happens at inference time, etc.

- Link method to hardware, or to clearly patentable types of innovation, where possible.

- Include supporting data.

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Questions?

Parminder Lally
parminder.lally@appleyardlees.com