

Study Note. The study of Module 3 will likely take 24 hours at a minimum. For convenience, self-assessment questions (SAQs) and claim drafting exercises for Module 3 are set out separately in Module 5 and should be done as indicated in the body of Module 3. Please send your answers to the claim drafting exercises to your tutor. You are encouraged to seek the guidance of your tutor on any of the issues raised in Module 3.

Module 3: Drafting a Patent Application

Learning outcomes

On successful completion of this module, students will be able:

to describe:

- the purpose and key role of claims
- the common legal requirements for claims around the world
- the different categories of claims, and the importance of claiming an invention from different aspects
- how to word claims and use different claim formats
- how to overcome prior art by amending the claims; and the need to provide support for such amendments
- technical fields that might be excluded or partly excluded from being patentable in some jurisdictions
- the concept of unity of invention

to draft claims for a patent application by:

- reading a description of an invention and drafting a claim covering the essential technical features of that invention.
- carefully analysing the draft claim to ensure that non-essential features are removed and that the terminology chosen is sufficiently general
- being aware when drafting the claim of ways in which potential infringers might attempt to avoid infringement
- if required, drafting more than one independent claim (e.g. one to a product and another to a process) to protect different aspects of the invention
- drafting a number of dependent claims
- considering alternative technical features (e.g. alternative materials to use, alternative uses of the invention) to be covered by the claims and included in the description

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3.1 What are claims for?

As we saw in Module 2, there are two main parts to a patent application:

- the descriptive part, which includes technical background etc., but most importantly includes a detailed description of one or more ways of carrying out the invention
- and the claims

The description is the scientific or technical part of the application. It explains how the invention works in sufficient detail for it to be carried out by a person familiar with the particular technology, the so-called '*person skilled in the art*'.

Since the description tells us all we need to know about the how the invention works, why do we need anything else? Why do we need claims?

Well, consider for example a patent which describes a newly developed bicycle, and goes into full detail about every part. What would I, as a manufacturer, have to do to be accused of infringing the patent? Would the patent separately protect each part of the bicycle described: the wheels, the frame, the handlebars, the brakes, the saddle etc., so that if I made any of these individual items I would infringe the patent? Or would I have to make a bicycle with all of the individual items in order to infringe the patent; or just some of them?

The answer is not obvious.

In days gone by, if a patent owner sued for infringement, the court would read through the patent, examine any drawings or formulae, perhaps consider any prior art to hand - and then the judge would decide

- (a) what the invention was, and
- (b) whether it had been infringed

Inevitably this created uncertainty, nobody knew where they stood until the matter came to court.

Hence the concept of claims was born. It became the responsibility of the applicant to make it clear in the patent what the invention was, and this was done in a separate section of the patent document – the claims. **So it is up to the applicant to state clearly exactly what the invention is that's being protected; and this is done in the claims.**

Some examples of claims:

Claim 1. The bicycle frame I've invented is lighter and stronger than any on the market

or

Claim 1. I claim an award of 10,000 USD for developing this outstanding invention

Are these claims any good?

NO! Claims should define the invention in terms of its technical features; not in terms of its advantages or benefits or what it might be worth

So for instance, although the whole of the bicycle has been described, it might be that the invention is making the frame out of a particularly strong, lightweight alloy.

In that case – after the description - the first claim in the patent might read:

1. A bicycle frame made of a magnesium-based alloy.

Or the invention might be in the construction of the saddle, in which case the first claim might read:

1. A saddle for a bicycle comprising a support and a cloth stretched across the support for a rider to sit on.

Or the invention might be in the relationship between certain parts e.g. in the way the handlebars are connected to the forks, in which case the first claim might read:

1. A bicycle in which the handlebar stem is connected to the top of the forks by means of a coupling comprising a first part clamped to the handlebar stem, and a second part clamped to the top of the forks, the two parts being relatively adjustable to alter the tilt of the handlebar stem.

Note This particular invention could also have claimed in a different way, as a method rather than a piece of equipment, e.g.

1. A method of assembling a bicycle comprising clamping a first part of a coupling to the handlebar stem, clamping a second part of the coupling to the top of the forks, and relatively adjusting the two parts to a desired tilt.

In each of these cases, we can find out exactly what is being protected by reading the claims. (In fact to protect all of these different inventions would require several patents, each with different claims.)

The claims set out the boundaries of the invention, within which it is forbidden to trespass.

Just as the description is the technical heart of the document, so the claims are the legal heart. It is the claims that competitors look at to see what they can or cannot copy; it is the claims that the courts look at to see whether or not a patent has been infringed; it is the claims that the Patent Office looks at to see whether an invention is new or not; and it is the claims that a person who wishes to licence or purchase the patent looks at when assessing its value and usefulness.

3.2 How to we go about drafting claims (broad claims; infringement; independent and dependent claims)

3.2.1 Drafting claim 1

Let's first look at a major difference between drafting the claims and drafting the description. As regards the description, the same invention can be described in lots of different ways, and the actual words used are rarely critical, just as long as there is sufficient detail for the

reader to understand how the invention works. (Although there are some pitfalls to avoid, see Part 2, section 1.6).

By contrast, the claims have to be very carefully worded, with legal precision; they are the most critical part of the application. The rights you get from your patent are determined precisely by how you choose to word your claims.

The most common fault of students is to include details and restrictions which unduly limit the scope of the claims and result in a patent that is at best weak and at worst useless.

Example

To illustrate this point let's take a look at a simple example.

It is well known to attach an eraser to the top of a pencil using a metal band, but this (a) cuts into the eraser and (b) limits the amount of the eraser that is usable. You have thought of an invention to solve these problems, by attaching the eraser to the end of the pencil without using a metal band.

To do this you make a conical opening 3' in an eraser 3. Then you first reduce the thickness 2 of the pencil 1 at one end, and secondly taper it into a conical shape 2' to fit the opening 3' in the eraser.

Finally, the conical end of the pencil is inserted into the opening in the eraser and glued in place by a layer of epoxy adhesive 4.

Fig 1

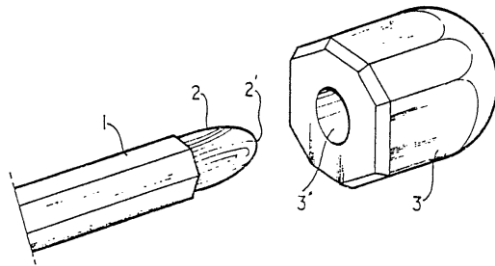
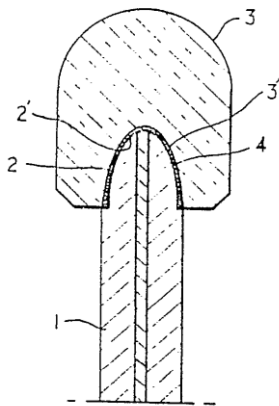


Fig 2



A first attempt at drafting a main claim for this invention might then read:

1. A pencil and eraser combination comprising an eraser with a conically shaped opening at one end, and a pencil with one end reduced in thickness and then tapered to form a conical shape to fit the opening in the eraser, the tapered end of the pencil being inserted into the opening in the eraser and glued in place by a layer of epoxy adhesive.

ARE THERE ANY PROBLEMS WITH THIS CLAIM?

Well, the student needs to understand that:

If someone just tapers the end of the pencil rather than reducing it in thickness and then tapering it, they will not infringe the claims; they will have 'designed around' the claims.

So this limitation should be removed from the claim which would then read:

1. A pencil and eraser combination comprising an eraser with a conically shaped opening at one end, and a pencil with one end tapered to form a conical shape to fit the opening in the eraser, the tapered end of the pencil being inserted into the opening in the eraser and glued in place by a layer of epoxy adhesive.

IS THAT OK?

Well, although the end of the pencil and the opening in the eraser have to be shaped to fit one another, maybe other shapes than cones could be used, for instance a cross shape. If the claim is limited to a conical shape, then competitors could avoid infringing the claim by using different shapes; so again they will have 'designed around' the claims.

So a better claim might be:

1. A pencil and eraser combination comprising an eraser with an opening at one end, and a pencil with one end shaped to fit the opening in the eraser, the shaped end of the pencil being inserted into the opening in the eraser and glued in place by a layer of epoxy adhesive.

ANYTHING ELSE?

Well, is it essential to use epoxy adhesive, or come to that is it essential to use adhesive at all? Maybe a friction fit would do.

So it is important to think of alternatives to your initial idea, and to consider what someone copying your invention might do to steer clear of or design around your claims. The claim should then be drafted with these thoughts in mind.

Taking these all points into account we arrive at a final version of the claim which reads:

1. A pencil and eraser combination comprising an eraser with an opening at one end, and a pencil with one end shaped to fit the opening in the eraser, the shaped end of the pencil being inserted into the opening in the eraser.

This is considerably wider in scope than our original claim 1 and will give much better protection against infringers.

In short, claim 1 should set out the technical features that are essential for solving the problem that's being addressed.

3.2.2 Dependent claims

What about the features that we have taken out of our original claim? Well these can be listed in further claims, called *dependent* claims. For instance we could draft a claim 2 which reads:

2. A combination as claimed in claim 1 wherein the eraser has a conically shaped opening at one end and the pencil has one end tapered to form a conical shape to fit the opening in the eraser.

This claim is interpreted exactly as common sense would lead you to expect. It protects the combination as set out in claim 1, but with the further limitation that the opening in the eraser and the end of the pencil must be conical in shape.

Patent applicants generally draft dependent claims just in case there turns out to be prior art around which falls within the scope of claim 1; and extra features have to be incorporated into claim 1 . (This frequently happens following the Patent Office search; less frequently it can happen after grant when a competitor is seeking to get a patent declared invalid. This topic is dealt with in more detail in section 3.7 below.)

Further dependent claims might read:

3. *A combination as claimed in claim 1 or 2 wherein the eraser has a conically shaped opening at one end and the pencil has one end reduced in thickness and then tapered to form a conical shape to fit the opening in the eraser.*

4. *A combination as claimed in claim 1, 2 or 3 wherein the shaped end of the pencil is secured in place in the opening in the eraser by a layer of adhesive.*

So the complete list of claims would read:

1. *A pencil and eraser combination comprising an eraser with an opening at one end, and a pencil with one end shaped to fit the opening in the eraser, the shaped end of the pencil being inserted into the opening in the eraser.*

2. *A combination as claimed in claim 1 wherein the eraser has a conically shaped opening at one end and the pencil has one end tapered to form a conical shape to fit the opening in the eraser.*

3. *A combination as claimed in claim 1 or 2 wherein the eraser has a conically shaped opening at one end and the pencil has one end reduced in thickness and then tapered to form a conical shape to fit the opening in the eraser.*

4. *A combination as claimed in claim 1, 2 or 3 wherein the shaped end of the pencil is secured in place in the opening in the eraser by a layer of adhesive.*

And we could claim the invention in terms of a method, e.g.

5. *A method of assembling a pencil and eraser combination comprising forming an opening in one end of an eraser, shaping one end of a pencil to fit the opening in the eraser one, and inserting the shaped end of the pencil into the opening in the eraser.*

6. *A method as claimed in claim 5 comprising forming the opening in the eraser in a conical shape, and tapering the end of the pencil to form a conical shape to fit the opening in the eraser.*

7. *A method as claimed in claim 5 or 6 comprising forming the opening in the eraser in a conical shape, reducing the thickness of the pencil at one end, and then tapering the end of the pencil to form a conical shape to fit the opening in the eraser.*

8. *A method as claimed in claim 5, 6 or 7 comprising securing the shaped end of the pencil into place in the opening in the eraser by means of a layer of adhesive.*

Notes

- Claims 1 and 5 are called *independent claims* since they are not dependent on any other claim.
- It is US practice for the dependant claims to read:

2 **The** combination as claimed in claim 1 wherein

3 **The** combination as claimed in claim 1 or 2 wherein

.. and so on

3.2.3 Dependent claims – further considerations

Correct dependencies; multiple dependencies

If claim 1 relates to *An axe comprising a handle and a head*; and claim 2 to *An axe as claimed in claim 1 wherein the head is of iron*; then if claim 3 is going to claim *An axe wherein the head is of aluminium*, it clearly cannot be dependent on claim 2, although it can be dependent on claim 1.

So a typical set of claims – with *correct dependencies* - might read:

1. *An axe comprising a handle and a head*
2. *An axe as claimed in claim 1 wherein the head is of iron*
3. *An axe as claimed in claim 1 wherein the head is of aluminium* [claim 3 can't be dependent on claim 2]
4. *An axe as claimed in claim 1, 2 or 3 wherein the handle is made of wood*
5. *An axe as claimed in claim 1, 2 or 3 wherein the handle is made of plastic* [claim 5 can't be dependent on claim 4]

And claims 4 and 5 which refer back to more than one previous claim are said to have '*multiple dependencies*'.

How many dependent claims is it necessary to have?

The pencil and axe examples described above are very simple, and it is only possible to think of a limited number of dependent claims. However, with a complicated piece of apparatus or a complex chemical composition, it would be possible to draft a large number of dependent claims. What will affect how many should be drafted?

- *There is no point in drafting dependent claims which only introduce conventional features.* For instance if the invention relates to what the inventor thinks is a new car, claim 1 might be of the form:
 - - 1 *A car comprising feature A, feature B and feature C*

Claim 2 might then read:

- 2 *A car as claimed in claim 1 having four wheels*

And claim 3 might read:

- 3 *A car as claimed in claim 1 or 2 wherein the body is made of metal*

If what's set out claim 1 turns out to be known, are claims 2 and 3 any good?

Well, if the extra features set out in claim 2 or in claim 3 are introduced into claim 1, will that make it novel or not obvious? The answer is 'no'; these claims relate to wholly conventional features and therefore would be of no use in distinguishing claim 1 from the prior art.

It's necessary to give careful thought to what the dependent claims say, bearing in mind their purpose, and this in turn will place a limit on the number

- *Some authorities charge the applicant according to the number of claims filed.* This is designed to limit the claims to a reasonable number, whilst allowing the applicant to file extra claims if there is a real need – for a price however!
- *Some authorities allow the filing of so-called 'omnibus claims.'* If we have a complex piece of apparatus, we might be able to think of lots of new features that could be the subject of dependent claims. If we are not worried about any extra costs that all these claims might incur, then we could write a long list of dependent claims gradually introducing more and more features until we've covered them all. To provide a short cut to this end point, some jurisdictions allow claims of the form:

4 *A car as claimed in any preceding claim, substantially as herein described with reference to the drawings*

This is called an *omnibus claim* and is interpreted as a claim which covers all the features of the invention as described and illustrated.

3.2.4 Some judgements

The importance of paying great attention to the wording of the claims is demonstrated by a number of judgements in the UK courts.

In *Catnic Components Ltd and another v Hill and Smith Ltd* [1982] RPC 183, [1983] FSR 512, the subject of the invention was a lintel i.e. a beam that builders put over a door or window to take the weight of the brickwork above. According to claim 1 of the patent, the lintel was a box structure comprising two parallel horizontal plates connected by two rigid supports, one inclined and the other 'extending vertically'. The alleged infringer copied the lintel but with the second support at six degrees to the vertical. The case went from the Court of Appeal to judges in the House of Lords who decided that the copy did indeed infringe the patent since a practical man would regard any support that was vertical enough to work as being 'vertical'.

Arguably when the claim was drafted, if it had said that the second support was 'generally vertical' or 'approximately vertical' there would have been no difficulty.

In *Improver Corp v Remington Consumer Products Ltd* [1990] FSR 181, the subject of the invention was a device for removing hair from women's legs comprising a helical spring bent into a curve with one end fixed to a small motor and the other end to a fixed bearing. When the spring was rotated at high speed, its windings opened and closed, catching and pulling

out the hairs. Claim 1 specified 'a helical spring', so the alleged infringer replaced the spring by a rubber rod with transverse slits. When the rod was rotated the slits opened and closed and pulled out the hairs just like the spring. In the UK, the court concluded that there was no infringement since the alleged infringer was not using a helical spring as required by claim 1. By contrast in Germany the patent was found to have been infringed, the rubber rod being regarded as functionally equivalent to a helical spring.

Arguably when the patent was drafted, there would have been no difficulty in the UK, if claim 1 had referred to 'means for removing hair' and a dependant claim 2 had said 'wherein said means is a helical spring'.

These judgements concern infringement actions, since it is at that stage that the claims of granted patents come under the most intense scrutiny. All of them illustrate that getting the drafting of the claims right is critical.

Please now answer SAQ 3.1 and SAQ 3.2

And then do Claim Drafting Exercise 1

3.3. THE LEGAL REQUIREMENTS

3.3.1 Around the world

What is required of the claims is set out in the law of the country or region in which you wish to apply for a patent. Here are some examples from around the world:

Patent Cooperation Treaty, Article 6 *The claim or claims shall define the matter for which protection is sought. Claims shall be clear and concise. They shall be fully supported by the description.*

Patent Law of the People's Republic of China, Article 26 *The written claim shall, based on the written description, contain a clear and concise definition of the proposed scope of patent protection.*

United States 35 U.S.C. 112(b) *The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.*

India Patents Act, Section 10(4) *Every complete specification shall ... end with a claim or claims defining the scope of the invention for which protection is claimed ... shall relate to a single invention, or to a group of inventions linked so as to form a single inventive concept, shall be clear and succinct and shall be fairly based on the matter disclosed in the specification.*

European Patent Convention, Article 84 *The claims shall define the matter for which protection is sought. They shall be clear and concise and be supported by the description.*

Korean Intellectual Property Office, Article 42 (4) *The .. claims shall describe the matter for which protection is sought ... (1) The claims shall be supported by the detailed description of the invention; (2) The claims shall define the invention clearly and in detail*

Intellectual Property Code of the Philippines, Section 36 *The application shall contain one or more claims which shall define the matter for which protection is sought. Each claim shall be clear and concise, and shall be supported by the description.*

Japan Patents Act, Article 36(6) *The ... claims..... shall comply with each of the following items: (i) the invention for which a patent is sought is stated in the detailed explanation of the invention; (ii) the invention for which a patent is sought is clear; (iii) the statement for each claim is concise ..*

Eurasian Patent Organisation Regulations, Rule 21(4) *The claims shall define the subject matter of the invention and express its essential technical features. Claims shall be clear and concise and shall be based on the description.*

Brazil Industrial Property Law, Article 25 *The claims shall be supported by the description, characterizing the particulars of the application, and clearly and precisely defining the subject matter that is the object of protection.*

African Regional Intellectual Property Organization (ARIPO), Protocol on Patents etc., Section 2(9) *The claims shall define the matter for which protection is sought. They shall be clear and concise and shall be supported by the description.*

3.3.2 Some conclusions

All of these examples effectively require the claims:

(a) to define the matter for which protection is sought

and most also require the claims

(b) to be clear and concise

(c) to be supported by the description.

Note that none of these extracts says anything about the breadth of the claims, or how to take into account what potential infringers might do. That is what we concentrated on in section 1.2 above. Which features to include in the claims, and the amount of detail to provide, are matters for the person drafting them. It's like the rules of football. The rules set out what the players can and can't do; but they don't say anything about how to play the game well or poorly.

So the Patent Office is not going to be interested in whether or not you include a lot of unnecessary detail in your claims. It will however in accordance with point (a) require you to *define your invention* in the claims, which is exactly what was discussed in 1.1 above.

In accordance with point (b), the Office will require you to use *clear* wording in the claims, so that readers know exactly what you're protecting, and to be '*concise*' i.e. to keep the claims short and to the point (In fact – as you will have noticed from the claims you've seen so far - each claim is written as a single sentence). The wording of claims is dealt with in detail in section 3.6. And in accordance with point (c) what you put in your claims must be '*supported by the description*'. This means for instance that you can't state in your claims that something is made of copper if you haven't said so in the description, or that the new table you've invented has five legs when you've only described tables with four. These topics will be dealt with in more detail later.

Please now answer SAQ 3.3

3.4 Different categories of claim (apparatus, method/process, use etc.)

Claims can be divided into two broad classes – (a) claims to a physical entity, and (b) claims to an activity.

Claims to a *physical entity* can relate to apparatus, devices, machines, systems, products, chemical compounds, and compositions. For instance:

- An apparatus for cleaning roads ...
- A computer memory....
- A steering mechanism incorporating an automatic feedback circuit ...
- A communication system comprising transmitting and receiving stations ...
- A woven garment ...
- A copper electroplating solution....
- An insecticide....
- An ointment comprising ...
- An isolated polynucleotide ..

Claims to an *activity* relate to methods/ processes. For instance:

- A method for cleaning roads ...
- A method of operating a computer..
- A method of controlling a steering mechanism..
- A method for communicating between ..
- A method for synthesizing acetophenone..
- A process for waterproofing a garment..
- A process for extracting ..
- A method for electroplating ..
- A method for isolating polynucleotides.

A further type of *physical entity* claim is a *product-by-process* claim. For instance:

- A product X made by a process comprising...
- A product X made by the process of claim 1 comprising ..

Product-by-process claims are allowable in some countries; but the law and its interpretation vary from one jurisdiction to another, so before filing an application with such a claim, it is essential to find out how the law works in the countries or regions in which you are going to file (by contacting the relevant Patent Offices or researching their websites for instance).

Under the European Patent Convention for instance, such claims are allowable only if the product itself is new and inventive. A product is not rendered novel merely by the fact that it is produced by means of a new process. In any case, if a process is claimed, the protection conferred by the patent extends to the products directly obtained by such process.

In some jurisdictions, and in special circumstances, claims are framed relating to a particular *Use*. For instance in Europe, the use of known substances for medical treatments is claimed in this way, as explained in Section 3.8.6 below.

3.5 Protecting the invention from different aspects

3.5.1 Broad and narrow claims; modifications and alternatives

We have seen the importance of removing non-essential features from claims to make them broad in scope, so that competitors cannot avoid infringement simply by making small changes to their products.

We have also discussed the importance of considering modifications and alternative ways of carrying out or using the invention and ensuring that these are covered in our claims (and description). It is easy to focus on a particular problem and miss the full potential or scope of the invention. For instance, spread spectrum communications, one of the pioneering communication technologies of the twentieth century, was originally conceived as a way to avoid signal jamming of radio-controlled torpedoes. This technology was later used to develop CDMA cell (mobile) phones (Code Division Multiple Access), an application far removed from the field of torpedoes.

As well as considering the broadest claims, in some countries it is a good idea also to include an independent claim corresponding to the product or process that is going onto the market, i.e. a narrower claim. So for instance taking the pencil and eraser invention described in section 1.2 above, as well as having the broadest claim:

A pencil and eraser combination comprising an eraser with an opening at one end, and a pencil with one end shaped to fit the opening in the eraser, the shaped end of the pencil being inserted into the opening in the eraser.

We might also include a narrow claim corresponding to what we are actually going to make and sell. For instance:

A pencil and eraser combination comprising an eraser with a conically shaped opening at one end, and a pencil with one end reduced in thickness and then tapered to form a conical shape to fit the opening in the eraser, the tapered end of the pencil being inserted into the opening in the eraser and glued in place by a layer of epoxy adhesive.

In other countries, the fact that all these extra details are covered in the dependent claims will be enough.

Also, by including *method* claims as well as *apparatus* claims, we are protecting the manufacturing process as well as the product. Some competitors will infringe device claims but not method claims and vice versa.

A method of assembling a pencil and eraser combination comprising forming an opening in one end of an eraser, shaping one end of a pencil to fit the opening in the eraser one, and inserting the shaped end of the pencil into the opening in the eraser.

3.5.2 Points of view (different potential infringers and licensees)

The claims should also take into account what might be called '*the points of view*' of different potential infringers.

For instance, if you've invented a component that goes into a device, don't just claim the device incorporating the component, claim the component by itself; and claim both independently. This makes it easier when litigating against different competitors.

Example - the flashlight and the battery holder

The invention is concerned with extending battery life in a flashlight by improving the connection between the battery and the bulb using a two-part copper connector.

The connector is made of copper and comprises a specially-shaped socket member for connection to the bulb, and a specially-shaped plug member for connection to the battery.

What are the claim options?

- (A) claim the whole set-up: flashlight, battery and connector
- (B) claim a flashlight incorporating a copper, specially-shaped socket member
- (C) claim a battery incorporating a copper, specially-shaped plug member
- (D) claim a connector comprising a copper, specially-shaped socket member and a copper, specially-shaped plug member.

What's the difference?

- If the flashlight and the battery were copied by different companies –neither would directly infringe claim A, but the flashlight manufacturer would infringe claim B, and the battery manufacturer would infringe claim C
- And a manufacturer of electrical connectors who copied the specially-shaped plug and socket members would infringe claim D

So include them all!

- *claim A has a multiple point of view*
- *claims B, C and D are more effective, each has a single point of view*

Similar issues arise when considering potential licensees; different licensees will be interested in different claims depending on what they are interested in manufacturing, importing or selling.

Please now answer SAQ 3.4 and SAQ 3.5

3.6. Claim wording and format

3.6.1 Words

Some points to bear in mind when drafting claims:

- As we have already seen, each claim is written as a *single sentence*, however long and complicated it is.
- It is a requirement that claims should be *clear*. So every word used should be carefully considered; words mean what they say, not what you'd like them to mean.
- That said, if in doubt – for instance if a term is ambiguous or perhaps you are using it in a particular way - you can include a definition of the term in the description and refer to it in the claims e.g. *A control system comprising an X (as defined herein), a Y...*
- You don't need to define terms well known in the art or industry, but if you do use an industry term, make sure that you understand exactly what it means and what it doesn't mean
- Avoid using Registered Trade Marks. A Trade Mark indicates the source of a product, not what it's made of. So if a claim read: *'A process for making a solution of X comprising dissolving X in Coca Cola (RTM)'*, it would not be clear, since there are a number of different formulae sold under this Mark
- Avoid relative words - such as *fast, slow, long, short, tall, wide, perfect, heavy, hot, cold, thin, strong*. These are generally imprecise and therefore make the claim unclear
 - Unless you are defining the relationship between two elements both of which are in the claim e.g. *'wherein the first piece is shorter than the second piece'*
 - Or unless the term is recognised in the industry e.g. *heavy water, short trousers*
- Avoid negative limitations in claims, such as: *'a tyre that is not solid'*. Instead, describe limitations in positive terms, such as: *'a hollow tyre'*
 - Unless the limitation cannot be phrased in any other manner e.g. *'a colour other than black'*
- When referring in a claim to the number of components of an apparatus can have, it is common to refer to *'at least one'* when the number can be one or more ; to refer to *'a plurality'* or to *'at least two'* when the number has to be two or more; and to say *'only one'* or *'a single'*, if it can't be more than one For instance:
 - *A football team comprising a plurality of players, including only one allowed to handle the ball and at least four others.*

3.6.2 'Means' for this and 'means' for that

We may have an invention comprising a machine for treating a material, which has several parts including a knife to cut the material. We could leave the knife out of claim 1, but if it an essential feature of the invention, it should be included. We could use the word 'knife' in claim 1, but as we know, this would open the door to infringers who cut the material in some different way, e.g. with a guillotine blade or a heated wire.

A way round this problem, which is accepted in many countries, is to use the expression 'means for cutting' in the claim, so that we include any way of cutting the material.

Similarly if something is nailed, screwed or glued to something else, we could refer to 'means for fastening' in the claim.

Some claims might have both conventionally claimed items and a 'means for ...'. For instance:

A bookcase comprising a frame, a plurality of shelves and means for fastening the shelves horizontally within the frame.*

* 'a plurality' means 'two or more'

(In other cases there will be a ready-made word already available. For instance if our invention uses a bucket, but could use a bowl, tank or tub instead, then we could use the general term 'container' in the claim.)

3.6.3 Antecedents - the correct use of 'a', 'an', and 'the'.

When introducing a feature into a claim for the first time, you should use the indefinite article 'a' or 'an'. For instance:

1. A pencil and eraser combination, comprising an eraser with an opening at one end, and a pencil ...

If you refer to these features again, you should then use the definite article 'the' (or 'that' or 'said' as appropriate). For instance:

1. A pencil and eraser combination comprising an eraser with an opening at one end, and a pencil with one end shaped to fit the opening in the eraser, the shaped end of the pencil being inserted into the opening in the eraser.

The same thing applies for the dependent claims. For instance:

2. A combination as claimed in claim 1 wherein the eraser has a conically shaped opening at one end and the pencil has one end tapered to form a conical shape to fit the opening in the eraser.

3. A combination as claimed in claim 1 or 2 wherein the eraser has a conically shaped opening at one end and the pencil has one end reduced in thickness and then tapered to form a conical shape to fit the opening in the eraser.

4. A combination as claimed in claim 1, 2 or 3 wherein the shaped end of the pencil is secured in place in the opening in the eraser by a layer of adhesive.

If however you have referred in a claim to something that is well known and always has basically the same parts, then you can use the definite article for those parts. For instance:

1. A bicycle in which the wheels

Note

It is US practice for the dependant claims to read:

2. **The** combination as claimed in claim 1 wherein
3. **The** combination as claimed in claim 1 or 2 wherein

.. and so on.

3.6.4 Two-part claims

Some authorities – for instance the European Patent Office - have a preference for two-part claims; with the first part setting out technical features which are essential to the invention but which are known (for instance as described in the closest prior art document), and the second part setting out technical features which are essential to the invention but which the applicant thinks are new. The second part is to be introduced by a phrase such as: ‘characterised in that’ or ‘characterised by’ or ‘wherein the improvement comprises’.

Say that we have invented a table with a chess board inlaid into the top. This might be claimed as:

‘A table comprising a top supported by a plurality of legs, and a chess board set into the top’

Under the two-part rule however, this claim would read:

‘A table comprising a top supported by a plurality of legs characterised in that a chess board is set into the top’

or

‘A table comprising a top supported by a plurality of legs, wherein the improvement comprises a chess board set into the top’

Such a claim will not always be appropriate, for instance when the invention is a new combination of known features, or when the applicant is not sure exactly which features are known and which are new. In general, Patent Offices that do have this rule tend not to be rigid in enforcing it.

In the US, where the use of this format is not compulsory, such claims are sometimes called ‘Jepson’ claims.

3.6.5 Constituent parts of a claim (practice on ‘comprise’ and ‘consist’)

In the US claims are regarded as having three constituent parts: (1) the preamble, (2) the transitional phrase, and (3) the main body of the claim

(1) The preamble is an introductory phrase which identifies the category of the invention protected. For instance it might simply read ‘A pair of scissors’ or be more complicated such as ‘An anthelmintic composition suitable for administration to warm-blooded non-human animals....’

(2) The transitional phrase is a short phrase (or single word) such as '*comprising*' or '*consisting of*'.

The choice of transitional phrase is important when filing patent applications in some jurisdictions, notably the US and EPO, since '*comprising*' is interpreted to mean something different from '*consisting of*.' If the claim says 'A table *consisting of* a top supported by a plurality of legs', then that's it; it can't have any more components; the claim is said to be 'closed'. If on the other hand the claim says 'A table *comprising* a top supported by a plurality of legs', then it could have more components e.g. a chess board set into the top; the claim is said to be 'open'.

Clearly when drafting claims for jurisdictions that follow this same practice, it is generally best to use '*comprising*' since this gives a claim of broader scope. '*Consisting of*' might be used say on the rare occasion when an invention is a simplification of a known apparatus i.e. essentially requires fewer components.

(3) The main body of a US claim then goes on to describe the essential technical features of the invention.

3.6.6 Punctuation

You can use *punctuation* in the claim if it makes the wording clearer. In the US, claims are typically punctuated with a comma and semi-colons along the following lines:

*Preamble, transitional phrase:
feature A;
feature B; and
feature C*

For instance:

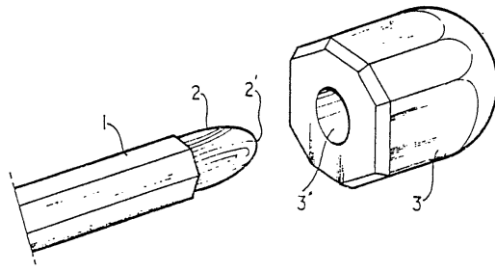
*A pencil and eraser combination, comprising:
a pencil; and
an eraser attached to the end of the pencil.*

3.6.7 Reference numerals in claims

In some jurisdictions it is acceptable to put reference numerals from the drawings into the claims, if this helps to clarify the meaning. For instance:

*A pencil and eraser combination, comprising:
a pencil (1); and
an eraser(3) attached to the end(2) of the pencil.*

Fig 1



Please now answer SAQ 3.6, SAQ 3.7, SAQ 3.8, SAQ 3.9, SAQ 3.10 and SAQ 3.11

3.7. Overcoming prior art; support by the description

Claims as filed

When the claims are initially drafted, they should take into account any known prior art. This may be for instance products already on the market that you know about; or documents found during a patentability search you have made in online patent databases, specifically to get a preliminary view as to whether or not your invention is known. The independent claim or claims should include one or more features not found in this prior art, in order to *distinguish them* from the prior art. So if you know that pencils with erasers on the end are known, you will have to put some other feature into the claim.

So this claim is no good, the prior art has all the features in it:

1. *A pencil and eraser combination comprising a pencil and an eraser attached to the end of the pencil.*

But this claim is clear of the prior art of which you are aware:

1. *A pencil and eraser combination comprising an eraser with an opening at one end, and a pencil with one end shaped to fit the opening in the eraser, the shaped end of the pencil being inserted into the opening in the eraser.*

And this is the claim – along with dependent claims – that you will put into the application.

New prior art turns up

However, new prior art may turn up after the application has been filed. In particular, when the Patent Office carries out its search to assess whether or not the invention is new, it might come up with one or more documents having all the features of the independent claim(s) (see the sample search report in Module 2).

What can be done?

If the application is to proceed, it will be necessary to amend the claims, to make them narrower in scope, so that they define an invention which is new and not obvious in the light of the document(s) found.

This can be done by incorporating into claim 1 a feature specified in a dependent claim. So if the Patent Office has found a document that has all the features of claim 1 i.e. the end of the pencil is shaped to fit into an opening in the eraser, but does not use adhesive, then you could incorporate into claim 1 the feature of adhesive from a dependent claim. So you would amend your claim to read:

- 1. A pencil and eraser combination comprising an eraser with an opening at one end, and a pencil with one end shaped to fit the opening in the eraser, the shaped end of the pencil being inserted into the opening in the eraser and being secured in place in the opening in the eraser by a layer of adhesive.*

What if none of the dependent claims mentions adhesive?

This does not matter ***as long as the description refers to using adhesive to secure the eraser to the pencil.*** So again you could amend the claims exactly as before.

(Note Although this amendment would make the claimed invention *new*, the Patent Office might still argue that it would be *obvious* to use adhesive and you might have to think again!)

Requirements of the description

There is a very important lesson to learn here, namely that you do not have to foresee every possibility when you draft the dependent claims in the original application, but if later on you wish to incorporate a feature from the description into a claim, that feature must already be in the description as filed, it cannot be added later.

So you can add new features into a claim, but only if the feature is in a dependent claim or in another independent claim or in the description; you cannot add new features to the description after filing – the claims must be supported by the description as filed. So you have to foresee alternatives when you draft the description.

This is fair and just, because when you file your application, you are given a filing date. If you could continue to add features to the description after filing, that date would not be valid for the whole application.

Granted patents

After your patent is granted, a competitor might still come in with some new prior art with a view to getting your patent declared invalid. If that's the case you might need to amend the claims and make them narrower in scope, just as described above.

Please now answer SAQ 3.12, SAQ 3.13 and SAQ 3.14

3.8 Inventions that are excluded by law or require a special approach

3.8.1 Introduction

As noted in Module 2, in many countries certain subjects are not considered to be patentable and are specifically excluded under the law. These typically include: scientific theories, mathematical methods, computer programs, plant or animal varieties, discoveries of natural substances, commercial methods, and methods for medical treatment.

As always however, what is important is what the *claims* say. So for instance if you have invented a new pharmaceutical, then a claim to a method of treating a patient with the pharmaceutical will not be allowed in Europe, but a claim to the pharmaceutical itself will be. In the US, both forms of claim would be acceptable.

The law and its interpretation vary from one jurisdiction to another, so before filing an application in one of the subject areas covered below, it is essential to find out how the law works in the countries or regions in which you are going to file (by contacting the relevant Patent Offices or researching their websites for instance).

**For information on practice in China, see *Patent Law of the People's Republic of China* at http://english.sipo.gov.cn/laws/lawsregulations/201101/t20110119_566244.html
See Chapter II, Article 25**

**For information on practice in Europe, see *Guidelines for Examination in the European Patent Office* at <http://www.epo.org/law-practice/legal-texts/guidelines.html>
Select Part G, Patentability (see particularly Chapter II, sections 3,4 and 5, and Chapter VII, section 7)**

For information on practice in Japan, see *Examination Guidelines for Patents and Utility Models in Japan* at http://www.jpo.go.jp/cqi/linke.cgi?url=/tetuzuki_e/t_tokkyo_e/1312-002_e.htm Select Part II, Requirements for Patentability, Chapter 1

For information on practice in Korea, see *Patent Examination Guidelines* at http://www.kipo.go.kr/kpo/user.tdf?a=user.english.html.HtmlApp&c=92006&catmenu=ek03_06_01 and see PART III (Requirements for Patentability)

For information on practice in the United States, see *Manual of Patent Examining Procedure (MPEP)* at <http://www.uspto.gov/web/offices/pac/mpep/index.html> Select Chapter 2100, Patentability, sections 2104, 2105 and 2106

Below, as an example of the complexities that can arise, is a summary of practice under the European Patent Convention in some important areas of technology.

IT IS EMPHASISED THAT WHAT FOLLOWS IN PARAGRAPHS 3.8.2 TO 3.8.7 IS SPECIFIC TO THE EUROPEAN PATENT CONVENTION – ALTHOUGH THERE MAY BE

SIMILARITIES IN A NUMBER OF RESPECTS TO THE LAW ELSEWHERE IN THE WORLD

3.8.2 Discoveries

Discoveries are not themselves patentable, unless either the discovery can be put to practical use or it produces a technical effect.

So, if it is discovered that a known material can withstand mechanical shock, that is not patentable, but a railway sleeper made from that material could be patentable. Or if a new, naturally-occurring substance is discovered, it is not patentable, *unless* it produces a technical effect e.g. has antibiotic properties. Similarly if a microorganism is discovered existing in nature and it produces an anti-biotic, the micro-organism itself may be patentable. And a gene which is discovered to exist in nature may be patentable if a technical effect is revealed, e.g. its use in making a certain polypeptide or in gene therapy. (For more on biotechnological inventions, see paragraph 6.7 below).

3.8.3 Mathematical methods

Mathematical methods as such are not patentable, but a *technical process* in which a mathematical method is used, may be patentable (for instance, a method of encoding audio information to reduce distortion). Similarly whilst a mathematical algorithm may not itself be patentable, a process or program in which the algorithm makes a technical contribution may be patentable.

A shortcut method of division would also not be patentable, but a calculator constructed to carry out the method (e.g. by executing a program) may be patentable.

3.8.4 Methods of doing business

Methods of playing the stock market, determining prices at auctions, arranging dates between customers etc. etc. are not patentable - although it is possible that such methods might involve an apparatus or process which does have *technical content* and so may be patentable.

3.8.5 Software

Inventions involving computer programs can be claimed in various ways: by claiming the program itself; or physical media carrying the program; or computers, computer networks or methods of operating computers in which one or more steps in the claim is carried out by the program. However to be allowable, ***the subject of the claim has to have a technical character.***

The mere fact that computer apparatus and computer programs are involved is not sufficient; there must be some ***additional technical effect*** over and above that. For instance:

- in the control of an industrial process (e.g. control of a fuel injection system in a car)
- in the internal functioning of the computer itself (e.g. a program to speed up processing).

3.8.6 Medical treatments and products (including first and second medical use)

European patents are not granted for *methods for treatment of the human or animal body by surgery or therapy, or diagnostic methods practised on the human or animal body.*

This exclusion does not apply to other methods e.g. treatment of a sheep in order to promote growth, or treatment of body tissues or fluids after they have been removed from the body.

Nor does it apply to products, in particular substances and compositions, for use in these methods. So pharmaceuticals can be patented (as can instruments, prostheses etc.)

For substances:

- ***If the substance is new***, it can be claimed as such
- ***If the substance is known, but its use in medicine is new***, this is called '**first medical use**' and can be claimed broadly as:
'Substance or composition X for use as a medicament', or
'Substance or composition X for use in therapy/diagnostics/surgery'
- ***If the substance is known, and also its use in medicine is known***, but it has been newly found to be useful in treating another condition; this is called '**second medical use**' and a narrow form of claim should be used, specifying the particular therapeutic, diagnostic or surgical use, e.g.:
'Substance or composition X for use in treating disease Y'

3.8.7 Biotechnology

Strict rules exist on biotechnology practice due to moral concerns over such issues as the patenting of life. However, in principle, biotechnological inventions are patentable under the European Patent Convention. The situation is complex and for authoritative guidance, reference should be made to the websites listed in section 6.6 above.

Some biotechnological inventions that are patentable in Europe are:

- (i) A gene sequence or partial sequence. This may be patentable if, for example, it results from technical processes for identifying and producing it outside the human body
- (ii) Inventions which concern plants or animals, provided that the application of the invention is not technically confined to a single plant or animal variety
- (iii) A microbiological process, or a product thereof, other than a plant or animal variety

Some exceptions from patentability in Europe are:

- (i) Processes for cloning human beings
- (ii) Processes for modifying the germ line genetic identity of human beings
- (iii) Uses of human embryos for industrial or commercial purposes
- (iv) Processes for modifying the genetic identity of animals which are likely to cause them suffering without any substantial medical benefit to man or animal, and also animals resulting from such processes
- (v) The human body, at the various stages of its formation and development, including germ cells
- (vi) Processes to produce chimeras from germ cells or totipotent cells of humans and animals
- (vii) Plant or animal varieties or essentially biological processes for the production of plants or animals. This exclusion does not apply however to microbiological processes or their products.

3.8.8 Conclusions

You may have noticed that a common thread runs through sections 3.8.2 to 3.8.7, namely that to be patentable what is claimed must have a *technical effect* or *character* or relate to a *technical process*.

Please now answer SAQ 3.15 and SAQ 3.16

3.9 Unity of invention

3.9.1 Why can't an application contain more than one invention?

Most patent laws only allow the applicant to have one invention per application. In the bicycle example given in section 1.1 above, we had three different inventions: a bicycle frame, a bicycle saddle and a bicycle in which the handlebars are connected to the frame by means of a special coupling.

If all three inventions were present in a single application, the Patent Office would have to carry out three searches and examinations for the price of one. Not surprisingly Patent Offices are not happy with this state of affairs, hence the requirement for unity of invention.

It is important to understand that filing an application which *claims* more than one invention – and it is the *claims* that count, not the description – is not fatal. If the Patent Office raises an objection that the claims relate to more than one invention, then the applicant can retain the claims relating to one invention, and delete the rest. If the other inventions are also important, then the applicant can file so-called *divisional applications*; these are fresh applications claiming the deleted inventions, but retaining the filing dates etc. of the original or *parent* application.

3.9.2 What constitutes more than one invention?

The first thing to make clear is that if you have a single independent claim with dependent claims, then that will constitute a single invention. So we could for instance have a claim set that reads:

1. *A bicycle wherein the frame is made of a magnesium-based alloy.*
2. *A bicycle as claimed in claim 1 wherein the saddle comprises a support and a cloth stretched across the support for a rider to sit on.*
3. *A bicycle as claimed in claim 1 or 2 wherein the handlebar stem is connected to the top of the forks by means of a coupling comprising...*

This is fine as far as it goes. The disadvantage – and it's a big one - is that the saddle has no *independent* protection i.e. a competitor could make and sell the saddle as long as it was not combined with the magnesium-alloy frame.

Similarly, a competitor could make and sell a bicycle in which the handlebars are connected to the forks by means of the special coupling - as long as it was not combined with the magnesium-alloy frame.

3.9.3 Is only one independent claim allowed?

The answer to that is 'no'.

For instance, we could have a claim to a bicycle in which the handlebar stem is connected to the forks by means of the special coupling; and a separate independent claim to a method of assembling a bicycle using that coupling, i.e.

1. A bicycle in which the handlebar stem is connected to the top of the forks by means of a coupling comprising a first part clamped to the handlebar stem, and a second part clamped to the top of the forks, the two parts being relatively adjustable to alter the tilt of the handlebar stem.

2. A method of assembling a bicycle comprising clamping a first part of a coupling to the handlebar stem, clamping a second part of the coupling to the top of the forks, and relatively adjusting the two parts to a desired tilt.

These two claims have a great deal in common and clearly relate to the same invention, even though one is to an apparatus, protecting the product, and the other to a method, protecting the assembly of the product.

Some other examples which may be regarded in some countries as a single invention – i.e. can be the subject of separate independent claims -are:

- A new product, a process specially for making that product and the use of that product
- A new process and an apparatus specifically for carrying out that process
- Intermediate and final products having the same or closely similar chemical structures
- Intermediate and final products wherein the final product is manufactured either directly from the intermediate or by way of a number intermediates all having the same essential structures
- A new electrical plug and a new socket specifically for that plug

The requirement for unity of invention is sometimes described as “*a single or unique general inventive concept*”.

3.9.4 Claiming alternatives (including Markush groupings)

In some cases, claiming a process which can use a number of different chemical (or non-chemical) alternatives may also be regarded as a single invention, provided that the alternatives are sufficiently similar. If the invention is a new chemical process, say, that can be performed with copper, lead or gold, then the claim could be drafted in a broad way and just refer to 'metal'. However, the inventor might be concerned that the process won't work with some metals e.g. mercury. Taking that into account, we could have three independent claims that read:

1. A process comprising steps X, Y and Z wherein the starting material is copper.

2. A process comprising steps X, Y and Z wherein the starting material is lead.

3. A process comprising steps X, Y and Z wherein the starting material is gold.

or we could have a single claim that reads:

1. *A process comprising steps X, Y and Z wherein the starting material is copper, lead or gold.*

Or in some countries, notably the US, the following form of wording is preferred (called a **Markush grouping**):

1. *A process comprising steps X, Y and Z wherein the starting material is a metal selected from the group consisting of copper, lead or gold.*

If the alternatives are of a similar nature, then the requirement for unity of invention is satisfied; if they are not – e.g. copper, lead, gold and marble - the Patent Office may regard this as not satisfying the unity requirement. What copper, lead and gold clearly have in common is that they are all metals. What marble has in common with these, e.g. that they are all materials that are solid at room temperature, may not be enough to satisfy the Patent Office that this is a group that is sufficiently coherent to satisfy the requirement for unity of invention.

Note: Markush claims were named after Eugene Markush, the first inventor to use them successfully in a US patent. In US1506316 for instance, which was granted to Markush in August 1924, claim 1 reads:

The process for the manufacture of dyes which comprises coupling with a halogen-substituted pyrazolone, a diazotized unsulphonated material selected from the group consisting of aniline, homologues of aniline and halogen substitution products of aniline

The alternatives are aniline, homologues of aniline and halogen substitution products of aniline; which were regarded by the USPTO as having sufficient in common to be regarded as a single invention.

Please now answer SAQ 3.17, SAQ 3.18

Then do Claim Drafting Exercises 2 and 3, followed by one further Exercise chosen from Exercises 4, 5 and 6

3.10 References to consult for help and for further reading

3.10.1 WIPO Patent Drafting Manual

This is a comprehensive guide to patent drafting which can be found at:

http://www.wipo.int/export/sites/www/freepublications/en/patents/867/wipo_pub_867.pdf

3.10.2 WIPO e-tutorial on *Using and Exploiting Patent Information*

This covers: *Patent Basics*; *Patent Search and Retrieval*; and *Patent Analysis* and is available free of charge (online or DVD), see: <http://www.wipo.int/tisc/en/etutorial.html>

3.10.3 Official websites

All large national Intellectual Property Offices/ Industrial Property Offices/Patent Offices have a website, as do many smaller ones. Their contact details, including website addresses, can be found in the Directory of Intellectual Property Offices on the WIPO website at:

<http://www.wipo.int/directory/en/urls.jsp> . Here you will find information on local law and practice as well as general guides to patents.

The websites of international and regional organisations are to be found at:

African Regional Intellectual Property Organization (ARIPO) <http://aripo.org/>

Eurasian Patent Organization <http://www.eapo.org/en/>

European Patent Organization <http://www.epo.org/>

Organisation Africaine de la Propriete Intellectuelle (OAPI) <http://www.oapi.int/>

The Patent Office of the Cooperation Council for the Arab States of the Gulf
<http://www.gccpo.org/DefaultEn.aspx>

WIPO <http://www.wipo.int/reference/en/>

3.10.4 Searching patents online

A number of Offices and Organisations provide free online search services. These are easy to use, and enable you:

- (a) to carry out a patentability search before filing your application (ie to look for relevant prior art), and
- (b) to find applications from around the world in your field of technology with a view to learning how they have been described and claimed.

For instance:

WIPO (*PATENTSCOPE*) <http://patentscope.wipo.int/search/en/search.jsf>

EPO (*Espacenet*) http://worldwide.espacenet.com/?locale=en_EP

Japanese Patent Office (how to search Japanese Patents in English)

https://www.jpaa.or.jp/old/english/patent/how_to_search.html

USPTO <http://www.uspto.gov/patents/process/search/>

For a comprehensive list of databases, see

http://www.wipo.int/patentscope/en/national_databases.html

END OF MODULE 3