

# How to read a patent specification



Occasionally an engineer may need to read a patent specification. This can sometimes be an uncomfortable experience, the document seems to be unreasonably repetitive and in parts almost incomprehensible. But all patent specifications, whatever the country of origin, follow roughly the same format, and have the same aim and similar legal requirements. This is intended to help.

by Vivien Irish

A patent specification, although it covers technical subject matter, is a legal document. It must comply with legal rules, and usually it will follow a tried and tested format because that format helps the patent attorney to get it approved by a patent examiner in a national patent office, resulting in a granted patent.

## The patenting process

The normal process is that an inventor generates an idea that she believes is new and solves a problem she is working on; she writes a description and sends it to a patent attorney who can either be an employee of the company the inventor works for, or an external agent in private practice.

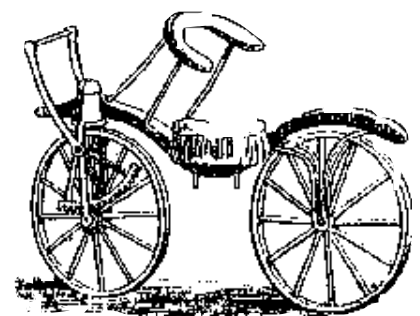
Preferably, if the budget permits, the attorney visits the inventor to see a demonstration or a prototype and to discuss the idea, to make sure he understands it. He asks questions about variations, the problems solved, and the closest existing idea which the

inventor knows about (inventors are usually thoroughly familiar with their technical field and therefore know about earlier patents or published technical papers).

The attorney drafts a patent specification, sends it to the inventor for correction and comments, amends it as needed and files it at the UK Patent Office. The title, the date of publication and the name of the applicant are published a short time later. About ten months after the filing date the attorney contacts the inventor to ask about improvements and variations, and adds them to the specification (provided that they relate to the same inventive concept). Within one year of the first application an updated specification is filed in every country of interest. For an electrical invention this is typically a few European countries, the USA and Japan.

Eighteen months after the first filing date in the UK the patent

Fig. 1 A hobby horse or 'swiftwalker'



## Possible apparatus claim for the first bicycle

1 *A transport device for a human being*

These introductory words indicate the general nature of the apparatus.

*characterised by*

The new part of the invention is defined after these words, with any known parts preceding them; we are assuming here that a bicycle is completely new.

*two or more wheels*

The transport device can be a bicycle or a tricycle, but not a unicycle.

*at least one wheel lying in front of the other wheel or wheels,*

'Rotatably connected' means any type of connection which permits the wheels to go round.

*a frame to which the wheels are rotatably connected,*

This change of position could, as written, change the distance of the front wheel from the rear wheel or wheels, so the drafter adds the 'whereby' clause to specify the function of the manually operable bar.

*a manually operable bar arranged to change the position of the front wheel with respect to the rear wheel or wheels whereby the transport device can be steered,*

*and foot-operable means to cause rotation of at least one wheel.*

'at least one' means that either the front wheel or the rear wheel or both wheels in a bicycle and either the front wheel or both rear wheels or all three wheels in a tricycle can be caused to rotate; the foot operation is not specified as the rotary movement we are familiar with, it could be an entirely up-and-down movement of the feet.

2 *A transport device according to claim 1 in which there are two wheels arranged as front and rear wheels in the same plane.*

This is a dependent claim, it refers to claim 1 and includes all features of claim 1 in addition to new features. A tricycle is now excluded but either a normal bicycle or a penny farthing is covered.

3 *A transport device according to claim 2 in which the foot operable means is arranged to cause rotation of the rear wheel.*

A penny farthing is now excluded because the pedals on it drive the front wheel.

4 *A transport device according to any preceding claim in which the front and rear wheels are of equal diameter.*

This is a multidependent claim; when claim 4 depends on claim 1 a bicycle with two equal wheels or a tricycle with all three wheels of equal diameter is included; when claim 4 depends on claim 2 or claim 3 then a bicycle with wheels of equal diameter is covered. A penny farthing is now excluded.

Six months or so after this, an examiner in each patent office provides his comments, often saying the invention is not new or is obvious in view of the prior art. The attorney either argues that the prior art is not close, giving reasons, or concedes that it is close and redefines the invention. After perhaps a second and even more rounds of argument, a patent is usually issued. This may be four or five years after the process started, and even longer in Japan where examination can be delayed for seven years.

The result is a granted patent, which is published again in its amended form.

So an engineer may see a patent at two stages—as filed in its unexamined form and after examination and grant. In the first form it is a patent application and if the application has been filed in the European Patent Office, this is shown by a seven-digit number followed by 'A'. A granted patent has the same number followed by 'B'. If it is an 'A' document the patent claims will almost certainly be changed before they are published in a 'B' document.

### Parts of a patent specification

A patent specification begins with a title which can be quite vague, such as 'Improved electrical switch' because in the UK the title is published and companies prefer not to give too much away at this very early stage.

The first paragraph puts the invention into context, saying a bit more about what the invention is, such as: 'An electrical switch for use in a domestic lighting circuit'. So if the reader is interested in a semiconductor switching circuit, he can stop reading and turn to the next document on his list.

There is then often a paragraph or two referring to earlier patents or published papers with a brief comment as to why the invention is more effective or cheaper or otherwise better—the attorney is preparing the ground for arguments with the patent office at later stages.

A paragraph beginning 'According to the invention' follows. This is a precursor of the claims at the end of the specification and defines the invention. A list of drawings comes next, showing at least one 'embodiment', i.e. an example of the invention, sometimes several embodiments showing variations. This list is followed by a detailed description of each drawing, using the reference numerals on the drawings to link the text to the figures.

The description probably seems unnecessarily detailed to an engineer reading it, but it is part of the tried and tested format. The legal

application is published by each patent office (except in the USA), together with a search report, i.e. a list of earlier patents or published papers ('the prior art') which a searcher in the patent office thinks are close to the invention.

requirement is that the description discloses the invention in a manner which is sufficiently clear and complete for it to be carried out by 'a person skilled in the art'—this means a technician with a general knowledge of the field to which the invention relates. The general principles have to be given, but not a full technical specification. For example, for an inventive electrical switch, the general principle on which it works must be described, but it is not necessary to give material specifications or precise dimensions.

Dimensions are generally absent in patent specifications, unless they help to make the invention clear. It is the principles that count.

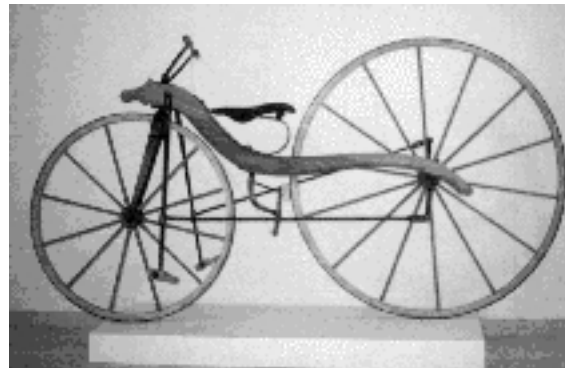
**Patent claims**

Finally there are numbered paragraphs headed 'Claims'. These are the most important part of the patent document. Each claim is a single grammatical sentence, although this is sometimes hard to believe. Claim 1 sets out the broadest definition of the inventive concept. It must have all the essential features of the invention—if a feature is missed out, the invention would not work and the claim would be invalid. Claim 1 must have no inessential features—if it had, a competitor could simply build the invention without the inessential feature and would not infringe the patent.

Claim 2 usually refers to claim 1, it 'depends' on claim 1 and thus it includes all the features of claim 1 and adds another detail. This is the first fall-back position. If the invention defined in claim 1 turns out to be not new after all, the invention as defined in claim 2 (with the additional material) may still be new, and a patent can be based on this narrower concept.

A claim is broad in scope if it has only a few features, known in the trade as 'integers'. The claim then covers all variations of the defined invention, using only the combination of integers as set out. A claim is narrow if it has a large number of integers. Thus a claim with lots of words is a narrow claim.

There are several types of claim; one is an apparatus claim, i.e. a claim to a new type of physical object. Another type is a method claim which covers a method of making something that is itself known, such as a new way to make a known pharmaceutical. Method claims can



**Fig. 2 An early bicycle propelled by a back-and-forward movement of the feet**

also apply to a new electrical test performed on known apparatus.

Suppose now we go back in time to the invention of the bicycle; an apparatus claim could have looked like that shown in the Panel.

Suppose the patent examiner finds a description of an early type of bicycle which had no pedals but which was operated by the rider in effect running along the ground; such a device existed, it was called a hobby horse. It had two wheels, a frame and a manually operated bar to steer with. All these known features must now be shifted to precede the words 'characterised by'. But it did not have foot-operable means, so the revised claim 1, with the foot-operable means now the only feature which characterises the invention, will define a novel invention. The claim has survived merely by rearrangement of the words.

However, suppose the examiner found a penny farthing cycle, and the inventor had not known about it. All the integers of claim 1 and of claim 2 are found in a penny farthing and a change has to be made to define a different invention, e.g. by incorporation of claim 4 into claim 1.

Nowadays, all the integers of the claims are known, because the principle of the bicycle is well known and would be implied simply by the use of the introductory words 'A bicycle comprising...'. Large numbers of inventions relating to bicycles have been made, mostly improving individual integers, e.g. chain drives, gears, sprung seats, handlebar design; this illustrates that most inventions are improvements to previous inventions.

Just as drafting patent claims requires expertise, so does interpretation of patent claims. Such interpretation is needed when a company is checking that its own product or process does not infringe a third party patent, or when a business thinks that one of its own patents is being used by others. Expert patent interpretation is then vital, as large sums of money, or even the company's future existence, could depend on the outcome. A patent attorney should be consulted for a full opinion on the situation.



**Fig. 3 An 'all mod cons.' bike**



**Fig. 4 The 'inventor' of the example probably thought this was unrideable**

© IEE: 2000

The author is intellectual property manager of Xaar plc and an IEE Fellow. She can be contacted at 18 The Common, London W5 3TR, UK.