INVENTOR'S COMMANDMENT #12

In your patent application, formulate at least one main (independent) claim. Make this claim as broad as the prior art permits by (1) reciting as few elements as you can, and (2) using the broadest possible terms for such elements, thereby to make it as difficult as possible for others to avoid infringing such claim.

INVENTOR'S COMMANDMENT #13

In your patent application, formulate (1) one or two alternative independent claims, making these as broad as possible, and (2) as many dependent claims as necessary to add all of the significant additional features of your invention, thereby to provide backup for your independent claim(s) and a range of coverage.

A. What Are Claims?

If you don't yet know what patent claims are, or have never read any, you're in for a surprise. The word "claim" in the patent context is definitely a term of art. A "claim" is not what the common dictionary definitions recite—it's not a demand for something due, a title to something in the possession of another, or that which one seeks or asks for. Rather, a "claim," in the arcane world of patents, is a very formally worded sentence fragment contained in a patent application or patent. Claims recite and define the structure, or acts, of an invention in very precise, logical, and exact terms. They serve as tools to determine whether an invention is patentable over the prior art, and whether a patent is infringed. Just as a deed recites the boundary of a real estate parcel, patent claims recite the "bounds" or scope of an invention for the purposes of dealing with the PTO and possible infringers. In other words, claims are the nitty-gritty of patents. While the specification must teach how to make and use the invention, the claims must define its scope.

While claims are literally sentence fragments, they are supposed to be the object of the words "I [or We] claim." They are actually interpreted, when in a patent application, as saying to the examiner, "Here is my definition of my invention. Please search to see whether my invention, as here defined, is patentable over the prior art." In a patent, claims are interpreted as little statutes that say to the public, "The following is a precise description of the elements of this invention; if you make, use, or sell anything that has all of these elements, or all of these elements plus additional elements, or that closely fits this description, you can be legally held liable for the consequences of patent infringement."

Since there are only five statutory classes of inventions (see Chapter 5), every claim must define something that is classifiable into one of these classes. Thus there are: (1) process or method claims; (2) machine claims; (3) article or article of manufacture claims; (4) composition of matter claims; and (5) claims reciting a new use of any of the previous four statutory classes. Again, the line between (2) and (3) is blurred. Fortunately, as mentioned in Chapter 5, you don't have to do the classifying unless the PTO decides that your invention doesn't fit within any class at all.

If all of this sounds a bit formidable, don't let it throw you; it will become quite clear as we progress, after you see some examples. What's more, when it comes to claims, every layperson who "prosecutes" (handles or controls) a patent application has a safety net: So long as you can convince the patent examiner that you have a patentable invention, the examiner is required by law to write at least one claim for you, for free. I discuss this, along with several aids to claim drafting, in Section G of this chapter.

But a word of caution. If you're tempted to skip this chapter and solely rely on the examiner, you can't. You must provide at least one claim in your application to obtain a filing date. In addition, familiarity with the information I provide here is essential to securing the strongest possible patent on your invention. So I urge you to approach this chapter as if there were no safety net. Take this chapter as I present it, in small, easy-to-digest chunks, and you'll have no trouble. If you don't understand something the first time, go back again so you'll be further down on the learning curve where you'll see things much more clearly.

B. The Law Regarding Claims

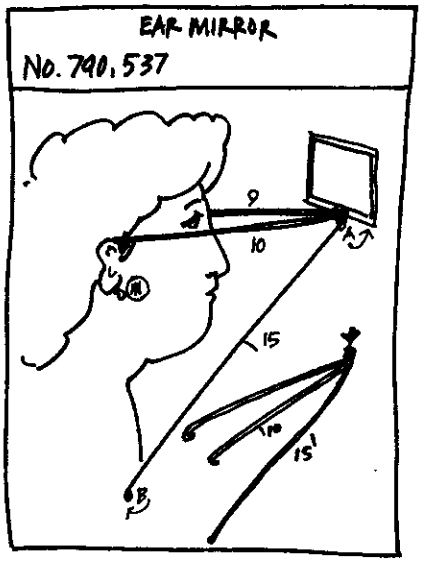
The law (statutes and PTO rules) concerning claims is written in only the most general and vague terms. Accordingly, I'll be turning to the real world of everyday practice to help you understand the actual requirements for drafting claims. Before I do, however, let's at least take a brief look at the law as it is written.

dent claim over three and each claim (independent or dependent) over 20—see Appendix 4, Fee Schedule.

Part (d)(1), enforced only sporadically, requires that the terms in the claims should correspond to those used in the specification. It has often been said that the specification should serve as a dictionary for the claims.

Part (e), a newcomer, was introduced to require that claims be drafted, insofar as practicable, in the German or "Jepson" style (from a famous decision of that name). The Jepson-type claim is very easy for examiners to read and understand. It puts the essence of the invention into sharp focus by providing in the first part of the claim an introduction that sets forth the environment of the invention—that is, what is already known, and in the second part, or body of the claim, the essence of the invention—that is, the improvement of the current invention. In practice, I've never seen this part of Rule 75 enforced.

Part (f) is self-explanatory and part (g) will be explained in Section J of this chapter.



C. Some Sample Claims

As mentioned, claims boil the invention down to its essence. In their broadest sense, they eliminate everything nonessential to the invention. In fact, many inventors first realize what their invention truly is when they write or see a claim to it, especially after the claim has been rejected in the patent prosecution process. Conversely, you won't be able to draft an adequate claim unless you have a clear understanding of your invention. Although not a patent attorney, the great theatrical producer David Belasco showed that he understood the principle behind claims well when he said, "If you can't write your idea on the back of my calling card, you don't have a clear conception of your idea."

And claims are difficult to write just because they are so short. Blaise Pascal once concluded a letter to a friend as follows: "I have made this letter a little longer than usual because I lack the time to make it shorter." Nevertheless, don't get discouraged; if you follow the step-by-step, four part procedure I give later, you'll find that writing claims is not too much more difficult than writing the specification.

Consider some hypothetical simple claims in the five respective statutory classes of invention. Patent applications containing the first four of these claims would now be rejected since the "inventions" they define are obviously old and in the public domain. The fifth—a "new use" claim—is from a patent.

1. Process or Method Claims—Conventional Process and Software Process

Here are examples of two method claims, one to a conventional process and one to a software-based process. Note that both claims recite a series of steps or individual operations, rather than a series of hardware elements as in an article claim. Note also that both claims are similar in construction, as discussed below, indicating that a software process is generally claimed the same way as any other process.

a. Conventional Process

For the conventional process, assume that you've just invented sewing and want to claim the process. Here's how you'd do it.

A method for joining two pieces of cloth together at their edges, comprising the steps of:

a. positioning said two pieces of cloth together so that an edge portion of one piece overlaps an adjacent edge portion of the other piece, and

b. passing a thread repeatedly through and along the length of the overlapping portions in sequentially opposite directions and through sequentially spaced holes in said overlapping adjacent portions,

whereby said two pieces of cloth will be attached along said edge portions.

Note that the first part of this claim contains a title, preamble, or genus, which states the purpose of the method but doesn't use the term "sewing," because sewing is the invention and is assumed to be new at the time the claim is drafted. The claim contains two steps, (a) and (b), that state in sequence the acts one would perform in sewing two pieces of cloth. Note that each clause begins with an "

ing" word. The claim also contains an optional "whereby" clause at the end to point out to the examiner or a judge the advantage of the process.

b. Software Process

For the software process, assume that you've just invented a word processor and want to claim the word insertion feature (which we now all take for granted) as a method. Here's how you'd do it.

A method of inserting additional characters within an existing series of characters on a display, comprising:

(a) providing a memory which is able to store a series of characters at an adjacent series of addresses in said memory,

(b) providing a character input means which a human operator can use to store a series of characters in said memory at said respective adjacent series of addresses,

(c) storing said series of characters in said memory at said adjacent series of addresses,

(d) providing a display which is operatively connected to said memory for displaying said series of characters stored in said memory at said adjacent series of addresses,

(e) providing a pointer means which said operator can manipulate to point to any location between any adjacent characters within said series of characters displayed on said display,

(f) providing a memory controller which will:

(1) direct any additional character which said operator enters via said character input means to a location in said memory, beginning at an address corresponding to the location between said adjacent characters as displayed on said display, and

(2) causing all characters in said series of characters which are stored in said memory at addresses subsequent said location in said memory to be transferred to subsequent addresses in said memory so that said additional character will be stored in said memory at said location and before all of said subsequent characters,

whereby said display will display said additional character within said series of characters at said location between said adjacent characters, and

whereby a writer can add words within existing body of text and the added words are displayed in an orderly and clean fashion without having to reenter said existing body of text.

Note that the preamble of this claim states the purpose of the method. The series of steps in the body of the claim first state or lay out the hardware of the computer (the memory, the display, etc.) as a series of "providing" clauses since a method claim is not supposed to state hardware directly, that is, if this claim recited simply "a memory," rather than "providing a memory," the examiner in the PTO would object to it as an improper hybrid claim because it recited both hardware and method steps. More on this later. Finally, note that the end of this claim also contains a first optional "whereby" clause which states the internal function of the claimed method, and a second "whereby" clause which states an overall, external, and meaningful result or function of the method. The two whereby clauses help sell the method to the examiner, as well as any judge who has to decide on the validity or infringement of this claim.

1. Machine Claims—Conventional and Software Machines

Here are examples of two machine claims, one to a conventional machine and one to a software-based machine. Note that both claims recite a series of hardware elements, rather than a series of steps as in the process claims. Note also that both claims are similar in construction, indicating again that a software machine is generally claimed the same way as any other machine.

a. Conventional Machine

For the conventional machine, assume now that you've just invented the automobile. Here's how to claim it.

A self-propelled vehicle, comprising:

a. a body carriage having rotatable wheels mounted thereunder for enabling said body carriage to roll along a surface,

b. an engine mounted in said carriage for producing rotational energy, and

c. means for controllably coupling rotational energy from said engine to at least one of said wheels,

whereby said carriage will be self-propelled along said surface.

This claim again contains a title in the first part. The second part or body contains three elements, the carriage, the engine, and the transmission. These elements are defined as connected or interrelated by the statement that the engine is mounted in the carriage and the transmission (defined broadly as "means for controllably coupling ...") couples the engine to at least one wheel of the carriage.

Again, the whereby clause recites the advantage of the hardware elements of the preamble and clauses a., b., and c.

b. Software Machine

For the software machine, let's make it easy and continue to assume that you've just invented a word processor and want to claim the word insertion feature as a machine. As I'll explain below, to obtain maximum coverage, it's best to provide both method and machine claims for an invention, if it's possible to do so. Here's the machine claim to the word processor:

A machine of inserting additional characters within an existing series of characters on a display, comprising:

(a) a memory which is able to store a series of characters at an adjacent series of addresses in said memory,

(b) a character input means which a human operator can use to store a series of characters in said memory at said adjacent series of addresses,

(d) a display which is operatively connected to said memory for displaying said series of characters stored in said memory at said adjacent series of addresses,

(d) a pointer means which said operator can manipulate to point to any location between any adjacent characters within said series of characters displayed on said display,

(e) a memory controller which will:

(1) direct any additional character which said operator enters via said character input means to a location in said memory, beginning at an address corresponding to the location between said adjacent characters as displayed on said display, and

(2) cause all characters in said series of characters which are stored in said memory at addresses subsequent to said location in said memory to be transposed to subsequent addresses in said memory so that said additional characters will be stored in said memory at said location and before all of said subsequent characters,

whereby said display will display said additional characters within said series of characters at said location between said adjacent characters, and

whereby a writer can add words within the existing body of text and the added words are displayed in an orderly and clean fashion without having to reenter said existing body of text.

Note that this machine claim is essentially the same as the above method claim on word processing, but our machine claim contains only directly recited hardware elements and no method steps. It's simply an alternative way of reciting the word processing invention. As I'll discuss below, it's desirable to provide as many different ways to claim an invention as possible, just as it would be desirable to go into battle with as many different weapons as possible (rifle, pistol, knife, grenade, etc.) since you never know which one will help you win the battle.

3. Article of Manufacture Claim

You've done it again! Here's a claim to the pencil you've just invented.

A hand-held writing instrument comprising:

a. elongated core-element means that will leave a marking line if moved across paper or other similar surface, and

b. an elongated holder surrounding and encasing said elongated core-element means, one portion of said holder being removable from an end thereof to expose an end of said core-element means so as to enable said core-element means to be exposed for writing, whereby said holder protects said core-element means from breakage and provides an enlarged means for holding said core-element means conveniently.

This claim, like the machine claim, contains a preamble and a body with two elements: (a) the "lead" and (b) the wood. As before, the elements of the body are associated; here the wood ("elongated holder") is said to surround and encase the lead ("elongated core"). The "whereby" clause at the end of the claim states the purpose and advantage of the lead and its holder.

4. Composition of Matter Claim

Now, great inventor that you are, you've come up with concrete. Here's your claim.

A rigid building and paving material comprising a mixture of sand and stones, and a hardened cement binder filling the interstices between and adhering to sand and stones, whereby a hardened, rigid, and strong matrix for building and paving will be provided.

This claim, although not in subparagraph form, still contains a preamble and a body containing a recitation of the elements of the composition (sand, stones, and cement binder), plus an association of the elements (sand and stones are mixed and binder fills volume between and adheres to sand and stones). Again, the whereby clause drives home the advantages of the components.

The height of brevity was reached (and will never be exceeded) in a composition of matter claim some years ago

when the PTO issued a patent to Glenn T. Seaborg on a new element, Americium; the claim read simply, *Element 95.*

5. New Use Claim

Someone discovered that pigs put on weight faster if aspirin is added to their diet. Here's how to claim it:

A method of stimulating the growth of swine comprising feeding such swine aspirin in an amount effective to increase their rate of growth.

This claim recites the newly discovered use of aspirin and the purpose of the new use in a manner that defines over and avoids the known, old use of aspirin (analgesic). Note that it is a method claim (as all new-use claims must be). This is because aspirin per se is old and thus must be claimed more narrowly, as a new use.

Now that you've read a few claims, I suggest you try writing a practice claim or two of your own to become more familiar with the process. Try a simple article or machine with which you are very familiar, such as a table, chair, pen, etc. Write the preamble and then the body. To write the body, first list the elements or parts of the article or machine, and then associate or interconnect them. Don't worry too much about grammar or style, but try to make the claim clear and understandable.

D. Common Misconceptions Regarding Claims

In my experience, inventors' misconceptions about claims are more widespread than in any other area of the patent law, except possibly for the misconception regarding the "Post Office Patent" explained in Chapter 3. Consider some of the following:

Common Misconception: *The more claims that the PTO (Patent and Trademark Office) allows in your patent application, the broader your scope of coverage.*

Fact: *The scope of your monopoly is determined by the wording of your claims, not their number. One broad claim can be far more powerful than fifty narrow claims.*

Common Misconception: *If you want to get broad coverage on a specific feature of your invention, you should recite that specific feature in your claims.*

Fact: *If you recite a specific feature of your invention in a claim, that claim will be limited to that feature as recited, and variations may not be covered—for example, if you have a two-inch, nylon gear in your apparatus and you recite it as such in a claim, the claim may not cover an apparatus that uses a one-inch gear, or a steel gear. The best way to cover all possible variations of your gear is to recite it simply as a "gear," or better yet, "rotary transmission means."*

Common Misconception: *To cover a specific feature of your invention per se, you need merely recite it in a dependent claim.*

Fact: *As stated in the statute quoted in Section B, above (35 USC 112, ¶ 4), a dependent claim is construed (and reads) as if it incorporated all of the limitations of the claim to which it refers. Thus if your independent claim (#1) recites a telephone having a connecting cord and your dependent claim reads, "The telephone of Claim 1 wherein said connecting cord is coiled," the dependent claim doesn't claim the coiled cord per se, but rather the coiled cord in combination with the telephone. More on this later in Section J, Drafting Dependent Claims.*

Common Misconception: *If a claim doesn't recite a specific feature of your invention, then this feature is necessarily not covered. For example, if your invention includes a two-inch, nylon gear and you fail to recite it specifically in a claim, then anyone who makes your invention with this gear can't infringe your patent.*

Fact: *The fact that a feature isn't recited doesn't mean that it isn't covered. An absurd example will make this clear. Suppose your invention is a bicycle and you show and describe it with a front wheel having 60 spokes. You don't mention the spokes at all in a claim; you simply recite a "front wheel." Any bike that has all of the limitations of the claim will infringe it. Thus a bike that has any "front wheel" will infringe, whether it has zero or 600 spokes.*

As I'll explain from time to time, to infringe a claim, an accused apparatus must have at least all of the elements of the claim; if it has more elements than recited in the claim, it still infringes, but if it has less, then it doesn't infringe. Claim limitations are thus interpreted using Boolean logic, similar to computer search terms, as explained in Chapter 6, Section M.

Common Misconception: *The more features of your invention you recite in a claim, the broader that claim will be. (Stated differently, the longer a claim is, the broader it is.)*

Fact: *As will be apparent from the previous common misconception, the less you recite in a claim—that is, the fewer the elements you recite—the broader the claim will be. This seeming paradox exists because an accused infringing device must have all the elements of a claim to infringe. Thus, the fewer the elements specified in a claim, the fewer the elements an accused infringing device needs to have to infringe. Put*

differently, infringement is generally easier to prove if a claim is made shorter or has fewer elements. "To claim more, you should recite less" is a Boolean concept that is difficult for most inventors to absorb, but that you should learn well if you want to secure the broadest possible coverage. Again, see Computer Searching in Chapter 6, Section M, for further clarification of this point.

E. One Claim Should Be As Broad As Possible

As stated in Inventor's Commandment #12, there are two ways to make a claim broader: (1) *minimize* the number of elements; and (2) *maximize* the scope of these elements. Let's see how this works.

1. Minimize the Number of Elements

Take our automobile claim, above, which recites three elements, A, B, and C—that is, the wheeled carriage, the engine, and the transmission. If an accused machine contains just these three elements, it will, of course, infringe.

If it has these three plus a fourth, such as a radio, which we'll label D, it will still infringe.

But if our accused machine contains only elements A and B, the carriage and engine, it won't infringe since it simply doesn't contain all of the claimed elements, A, B, and C.

If a claim contains many, many elements, say A to M, only devices with all thirteen elements, A to M, will infringe. If the maker of the device eliminates just one of the thirteen elements, say G, the device will *not* infringe. Thus, it's relatively easy to avoid infringing a claim with many elements.

If a claim contains only two elements, A and B, any device with these two elements will infringe, no matter how many other elements the device has. The only way to have the device avoid infringement is to eliminate either element A or element B, a relatively difficult task.

Thus, it should be very clear that the fewer the elements in a claim, the harder the claim will be to avoid, that is, the broader it will be and the more devices it will cover. Therefore, when drafting a main or independent claim to your invention, it will behoove you to put in as few elements of your invention as possible. (You do have to include sufficient elements so that the claim recites an operative, complete assemblage that is novel and unobvious over the prior art. More on this in Sections F and G, below.)

2. Maximize the Scope of Elements

With regard to the second way of broadening a claim, that is, reciting existing elements more broadly, consider a few examples. Suppose an invention involves a chair. The chair can be drafted broadly as "a seat" or narrowly as a four-legged maple chair with a vinyl-covered padded seat and a curved plywood back. Obviously, a three-legged plastic stool would be "a seat," and it would infringe the broadly recited element, but would miss the narrowly recited maple chair by a country mile. In electronics, "controllable electron valve" is broader than "vacuum tube" or "transistor." In machinery, "rotational energy connecting element" is broader than "helically cut gear" or "V-belt."

One way of reciting elements broadly is to take advantage of paragraph 6 of Section 112 by reciting an element, wherever possible, as "means" plus a specific function. In this way, any device or means that performs the function and was the equivalent of the supporting structure in the specification would infringe. For example, "means for conveying rotational energy" is broader than a drive belt and covers gears, pulleys, and drive shafts if these are the equivalent of a belt, which they will be determined to be if you've mentioned them in the specification. "Amplifying means" is broader than and covers such items as transistor amplifiers, tube amplifiers and masers.

If you do use the word "means" in a claim, Section 112 requires that the claim recite a "combination"—that is, two or more elements or parts. Claims that recite a single element are not supposed to use the word "means" to describe the single element since this is considered too broad—for example, "17. Means for providing a continuously variable speed/power drive for a bicycle" would be an example of a prohibited "single means" claim. However, you can effectively obtain practically the same breadth of coverage by adding an immaterial second element to the claim to make it a combination claim. Thus, "17. In combination, a bicycle having a pedal mechanism and means for providing a continuously variable speed/ power drive for coupling rotational energy from said pedal mechanism to a wheel of said bicycle" would satisfy Section 112.

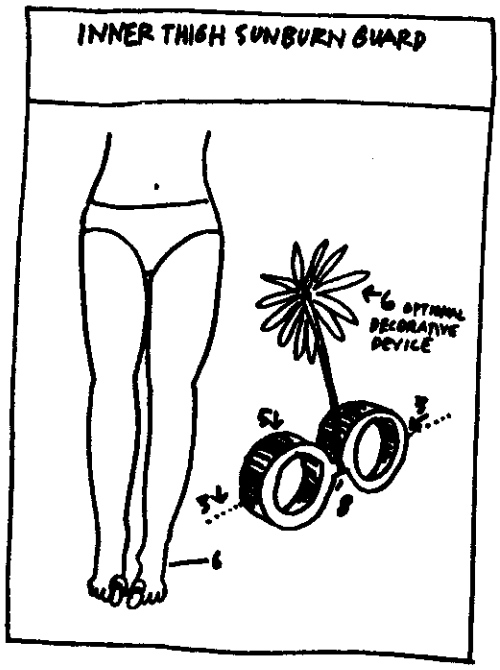
Courts have recently been construing "means" clauses narrowly, so you should also include claims with "structural" (non-means) clauses; these clauses can be expanded under the "doctrine of equivalents" (Chapter 15, Section J).

To sum up, while you should write your specification as specifically and with as much detail as possible (Chapter 8), you should make the substance of your claims as general (broad) as possible by (1) eliminating as many elements as is feasible and (2) describing (reciting) the remaining

elements as broadly as possible. In other words, make your specification specific and long and your main claims general and short.

F. The Effect of Prior Art on Your Claim

Now that you've learned how to make your claims as broad as possible, it's time for the bad news. What is "possible" has generally much less breadth than you'd like. This is because each claim must define an invention that is patentable over the prior art. Remember the issues of novelty and unobviousness? Well, they (especially unobviousness) are an ever-present factor always to be considered in claim drafting.



1. Novelty

Let's go back to Section 102, which deals with novelty (Chapter 5). A claim must define an invention that is novel in view of the prior art. It must recite something that no single reference in the prior art shows—that is, it must contain something new or novel. Your claim must recite novel hardware (or a novel process step) in a positive, structurally supported, unequivocal manner. For example, reciting "a wheel for providing lateral stabilization" won't adequately define over a prior-art wheel that doesn't provide lateral stabilization since the function isn't supported by novel structure. The remedy: recite the novel structure that does provide the stabilization—such as a guideway for the wheel, or a "means" for providing stabilization.

Just as a claim can be made broader by eliminating elements and reciting the existing elements more broadly, it can be made narrower in order to define novel structure (1) by adding elements, or (2) by reciting the existing elements more narrowly.

For an example of adding elements, suppose a prior-art reference shows a machine having three elements—A, B, and C, and your claim recites these three elements A, B, and C. Your claim would be said to lack novelty over the prior art and would be rejectable or invalid under Section 102. But if you added a fourth element, D, to the claim, it would clear the prior art and would recite a novel invention (but not necessarily a patentable one, because of the unobviousness requirement). (If the prior art were an in-force patent that *claimed* elements A, B, and C, and your *device* had elements A, B, C, and D, it *would* infringe for reasons given in Section E1, above. However, the PTO is never concerned with infringements, so you don't need to worry about this issue in a patent application.)

For an example of reciting existing elements more narrowly, suppose the prior art shows a machine having the same three elements—A, B, and C. You could also clear this prior art and claim a novel invention by reciting in your claim elements A, B, and C′, where C′ would be the prior-art element C with any change that isn't shown in the prior art. For example, if the prior art shows element C as a steam engine, and you recite a gasoline engine (C′), you've obviated any question of lack of novelty (though probably not obviousness).

In sum, although you'd like to be able to eliminate as many elements as possible and recite all of your elements as broadly as possible, you will usually have to settle for less because there will always be prior art there to make you toe the line of novelty.

2. Unobviousness

As I've stressed, novelty isn't enough. The claims must define an invention that would be unobvious to one having ordinary skill in the art. Or to use the paraphrase of the law from Chapter 5, the novel feature(s) of the invention defined by each claim must have one or more new features that are important, significant, and produce valuable, unexpected new results. Thus, when you have to narrow a claim to define over the prior art, you must do so by adding one or more elements or by reciting existing elements more narrowly, and you must be sure that the added or narrowed elements define a structure or step that is sufficiently different from the prior art to be considered unobvious. More on this in Chapter 13.