

## PREPARING A PATENT APPLICATION

### Patentability

1. The idea, concept or device must be novel. It cannot have been publicly known anywhere in the world prior to its invention by you. Public disclosure includes publication, display, presentation, offer for sale, commercial use or inclusion in a previous patent.
2. The invention must be kept confidential. In the United States a patent application can be filed one year from the date you publicly disclose, BUT in the rest of the world, the right to file is lost the day it is disclosed. Therefore, it is important to contact the Technology Transfer office before making any public disclosure.
3. The invention must not be obvious. An argument must be made that an average person who is skilled in the field would not have thought of the invention as an obvious extension or combination of existing knowledge. This is the most difficult test because the patent examiner can argue that IF a person knew about A, B and C they could have arrived at X.
4. Inventions which are NOT patentable include theories, plans of action, mental processes, laws of nature, mathematical expressions or algorithms, methods of doing business or naturally occurring substances (although their isolation or use may be patentable).

### General Considerations

1. A patent application is divided into two distinct parts.

Disclosure or Specification -- The disclosure comprises the bulk of the patent application. It includes a discussion of all related literature, patents and publicly disclosed material. It contains a detailed explanation of the invention and how it differs from all prior public matter, and it describes the best mode of practicing the invention in enough detail that an average person skilled in the field could reproduce the invention. Drawings are strongly encouraged. After the patent application is submitted the disclosure may NOT be changed.

Claims -- The claims describe exactly what is covered by the patent. The structuring of the claims is very important and should be done by an experienced patent attorney. The claims can be changed during the examination. In fact, the examination usually results in the addition, deletion or changing of many of the claims.

The claims are very important because they are the part of the patent which defines what is protected. The disclosure is used to interpret the claims.

2. Everything which is pertinent to the invention must be disclosed in the application. There can be no secrets -- the patent will be ruled invalid if it is discovered that information was withheld. All background information and sufficient personal knowledge to implement the invention in its best mode must be included in the disclosure.

It is generally accepted that a patent is only proven to be good if it holds up against a challenge in court. A common argument for invalidation is the existence of "prior art". If an item of related art is submitted and considered by the examiner and he/she judges it to not be prior art, then the burden lies upon the opposition to prove that the examiner's judgement was wrong. Therefore, disclose everything.

3. In literary prose we are encouraged to use a variety of words or expressions even though they may refer to a single object, action, function, etc. In legal documents a single term must be used to refer to a given object, action or function consistently throughout the document. If different terms are used, it is assumed that the meanings are different. Avoid terms which are very esoteric or non-conventional. Any unusual terms should be defined.

The terms "comprising ..." and "consisting of ..." are often used in patents. Comprising means, it has all of the following, but may have more. Consisting of means, only the following.

4. Patent applications should be succinct. There is no need to describe or understand the theory behind the invention. Rehearse only that which is novel -- everything else can be incorporated by reference if it is available in the public literature. If some material from the literature is critical, it should be referred to with the words, "incorporated herein by reference".

*Example:*

*For a detailed description of a suitable encoder circuit used in the system shown in Figure 1, see Figure 3 and Col 3, line 16 - Col 4, line 27 of Smith et al., 4,362,193, incorporated herein by reference.*

5. When describing the invention, details amounting to routine knowledge in the technology do not have to be disclosed, but the reader must not be required to do an unreasonable amount of experimentation to practice the invention. (e.g., One would not have to describe a distillation apparatus in a chemical process application.)

## PATENT APPLICATION FORMAT

### 1. The CLAIMS -- Define the Invention

Before work on the application is initiated, the scope of the invention should be defined. One should generate a series of brief statements which describe the invention as precisely as possible. Each element of the invention should be listed separately.

One should attempt to make the description of the invention as broad as possible while remaining novel and non-obvious. Broad coverage will provide the maximum deterrent to inventing around the patent. After determining the breadth of the invention, one should very carefully define each detail of the invention which is novel.

This precise definition of the invention will become the "Claims" of the patent. You are not encouraged to try to draft the claims because every word and construction element is very important in interpreting the claim. Therefore, this is left to the patent attorney. However, one should still try to carefully define the invention before proceeding with the disclosure.

There may be several independent claims which define major elements of the invention. The first claim is usually the broadest claim the applicant believes he/she is entitled to receive within the limits of patentability described above. Subsequent claims define narrower features of the invention. There may also be groups of dependent claims under each independent claim which elaborate details or alternative implementations of the major independent claims. All possible alternatives which can be used to achieve the invention should be included, and each should be listed separately for clarity. Each claim must recite all principal elements or steps of the subject portion of the invention.

#### Classes of Claims

Each claim must be directed toward one of the following classes of inventions (e.g., Do not combine a machine and a process):

A. Machines - an apparatus that performs a task or function. Machines are usually described as a combination of interrelated physical elements. The emphasis is on the parts or hardware rather than the activity or process. However, machine claims commonly cover electronic or computer program-implemented inventions.

#### *Example:*

*A computer-aided chemical analyzer for analysis of physiological samples, comprising:*

- 1) means for holding a test sample at a sample station;*
- 2) means for performing a plurality of analytical tests of said test sample, said analytical testing means further comprising a plurality of input/output devices for providing output signals representative*

*of physical characteristics of the test sample, and said input/output devices including a monochromatic scanning spectrophotometer for selectively directing substantially monochromatic light of a selected wavelength at a test sample and means for measuring the monochromatic light absorbed by the test sample;*

- 3) *processing means including a host digital computer having a control program for controlling the analytical testing means and calculating data from output signals of the input/output devices and*
- 4) *computer compatible data entry means for communicating specific test instructions to said processing means, wherein said data entry means may provide test instructions to operate and control at least one of the input/output devices, and wherein said control program includes primitive instructions designed to utilize test instructions received by said computer compatible data entry means to automatically create new control and test procedures and parameters for performing and controlling analysis of a test sample with one or more of said input/output devices.*

B. Articles of manufacture - a specific item having novel and non-obvious features or functions but not having moving parts which perform key operations. A better mouse trap, a snow board, pencil, tire, ladder, desk, etc.

C. Composition of matter - a novel chemical structure which has been newly synthesized, a new metal alloy, soap, gasoline, asphalt, glue, etc. (Naturally occurring substances are not patentable.)

D. Processes or Methods - how a machine operates, how to operate upon material (form, extrude, heat, cure, etc.), how to make something, how to synthesize a chemical, how to process data to generate a computer display (software patents), etc.

*Example:*

*A method of addressing a dynamic random access memory device including a substrate having a trench formed therein, a plurality of word lines formed on said substrate, a plurality of bit lines crossing the word lines formed on said substrate, an array of memory cells arranged in rows and columns on said substrate and located at crossovers of said word lines and said bit lines, and addressing circuitry for selecting a desired one of said word lines and a desired one of said bit lines to define and address one of said memory cells, each of said memory cells including a storage element including a capacitor trench, and a transfer gate means responsive to said addressing circuitry for interconnecting selectively said storage element and said selected ones of said word lines and said bit lines, said transfer gate means and drain electrodes connected between one of said word lines and a corresponding memory cell and a gate electrode connected to a bit line, said method comprising the steps of:*

*applying a first addressing signal to a selected one of said word lines corresponding to a desired column of said array; and*

*applying a second addressing signal to a gate electrode of a selected one of said bit lines corresponding to a desired row of said array.*

Claims are often structured with a preamble, transition word or phrase such as ("comprising" or "consisting of") and the body. The preamble recites background or environment in which the invention is to be used while the body defines the invention (its structural elements, steps, etc.). The above example of a process claim is structured in this manner.

The claim section is placed last in the application. Remember, do not worry about the wording or form of the claims -- the attorney will do that. Just try to completely define the invention.

## 2. Technical Field

There should be a general introductory statement which categorizes the general technology or subject of the invention. (Make sure that it is as broad as the broadest claim.) This is followed by a more detailed statement which narrowly defines the field of the invention.

### *Examples:*

*The present invention relates to solid-state image sensors, and more particularly to a solid-state image sensor in which a driver circuit portion for transfer gates and charge transfer devices and a photodetector portion are integrated on a single common semi-conductor substrate.*

*This invention relates to text processing, and more particularly to methods for automatically prompting a text processing operator with the correct spelling of a misspelled word.*

## 3. Background Art

This section can be used to describe the current state-of-the-art in the technology. It helps educate the reader who may be a member of a jury with no technical background. It should contain a carefully drafted review of all related literature and patents. (An on-line patent search may be conducted at the BYU library, or the University of Utah library has a complete patent repository that may be used.)

The Background Art section should begin by describing what the invention will improve. It should help the reader understand why the invention was made, what problem it solves, and why the invention is important. Do not dilute the importance of the invention by discussing problems that are not related to the invention or are not actually solved by the invention. Be objective and specific -- do not make broad, general statements such as it improves economy or gives better performance, etc. Define all technical terms (an appendix may be appropriate.)

The Background Art section should make an argument in favor of the unobviousness of the invention over the prior art; therefore it must set forth the deficiencies of the prior art.

Caution! Do not describe any of your thought processes or your own work which was kept confidential as "prior art". Make all of your work part of the invention. It is important to maintain a clear demarcation between admitted prior (disclosed) art and the present invention. Figures and drawings are helpful.

A good Background Art section will include answers to the following questions:

1. To what art area or areas is the invention directed?
2. What is a practical application of the invention that will have relevance to an ordinary person?
3. What is the level of ordinary skill in the art?
4. How has the art evolved?
5. Is the art crowded or open?
6. What deficiency or problem in the art will be solved by the invention?
7. How and under what circumstances did the deficiency or problem become discovered or known?
8. How was the deficiency or problem in the prior art previously approached unsuccessfully by the inventor and by others?
9. What analogous prior art is there with similar disadvantages and how were those disadvantages corrected?
10. What properties associated with the prior art "teach away" from the solution found by the inventor?

#### 4. Objects (or Objectives) of the Invention

Objects of an invention are not required and should not be used if the invention was discovered through serendipity. The objectives of the invention should be listed in order beginning with the broadest and should address some deficiency of the prior art. Each object should describe a characteristic desired in the invention without detailing any means for achieving that characteristic. They should provide the connection between the problems identified in the Background Art section and the embodiments of the invention to follow.

*Example:*

*One object of the invention is to improve user identification and account verification in financial transactions.*

*Another object is to modularize the components of a user identification and account verification system.*

*A further object...*

#### 5. Disclosure of the Invention

This section is a summary of what is claimed as the invention. It should be written in language which will be easily understood so that a non-technical person, who may have difficulty interpreting claim language, can easily understand it. Each aspect of the invention which will be included in the claims should be addressed with a separate paragraph.

*Example:*

*A method of fault testing random access memory systems comprises writing random bits successively into all the cells of the array, reading the bits and, in response, identifying any memory faults. In accordance with one aspect of the invention, the method involves writing random bits, followed by their complements, successively into the cells through one sequence of cell addresses. Through an opposite cell sequence, the contents of the cells are read and compared to first expected contents, then rewritten again in complemented form. Finally, the contents of the cells through the address sequence are read and compared to second expected contents. Memory faults are identified as a result of the comparisons.*

*In accordance with another aspect of the invention, the apparatus comprises a reversible pseudorandom number generator fashioned either from hardware using recirculating shift registers, for example, or by software, to generate random bit sequences. The generator is of a reversible type to enable the cells to be selectively up-addressed or down-addressed during writing of a sequence into the memory for carrying out the bidirectional testing sequence. The generator thus generates the same pseudorandom sequence for each particular initial setting of the contents of the generation (i.e., the "seed") to develop sequences that are repeatable but to have a characteristic of randomness. Control circuitry identifies and reports foulest found during the test, depending upon the bits read from the memory and those expected from the particular pseudorandom sequence generated. Because there is a tendency for the high order address lines to be exercised infrequently during sequential addressing, a second, independent, address function is added whereby during successive address sweeps, each address is selected once and only once. The address function is parameterized by the size of the memory, to cause substantial activity on all address lines.*

*A further object of the invention, therefore, is to exercise all order address lines substantially equally in memory fault testing. Another object is to uniformly address cells in a fast random access memory testing algorithm.*

*Still other objects and advantages of the present invention will become readily apparent to those skilled in this art from the following detailed description, wherein I have shown and described only the preferred embodiment of the invention, simply by way of illustration of the best mode contemplated by me of carrying out my invention. As will be realized, the invention is capable of other and different embodiments, and its several details are capable of modifications in various obvious respects, all without departing from the invention. Accordingly, the drawing and description are to be regarded as illustrative in nature, and not as restrictive.*

It is helpful to conclude the Disclosure with a summary statement which describes why the invention is advantageous.

*The method and apparatus of the invention, using a "probablistic search," thus tests a large number of cells in a short period of time. The probability of missing a fault among an array of cells is relatively remote, even though several different types of faults can be identified.*

Drawings are very helpful in disclosing the invention. They should clearly depict every claimed inventive feature of the invention. Block diagrams are very helpful for complex processes,

electronic circuit functions, software architectures, etc. Each figure or drawing should have a short description or legend. Elements of the drawing should be identified by numbers and arrows pointing to the object. These reference numbers should then be used liberally in the text. The drawings will probably be redrawn by a patent draftsman because they have to conform to several format restrictions.

6. Best Mode for Practicing the Invention (Preferred Embodiment)

Patent law requires that the invention must be described in such full, clear and concise terms as to enable an average skilled person to practice the invention. The description must also disclose the form of the invention which the inventor considers to be the best at the time the application is filed. Multiple embodiments may be included in the patent if it is judged that each is important.

7. Abstract

An abstract must be included in the application. It may be no more than 250 words and legal sounding words or language should not be used.

8. Sample Patents

Two issued patents are included in an appendix. These are relatively short patents but they can serve well as examples. Additional patents in various fields of application are available from the Technology Transfer Office.

**ACKNOWLEDGEMENT:**

Much of the material and all of the examples in this summary were paraphrased or taken directly without the use of quotation marks from Patent Applications Handbook, by Stephen A. Becker, Clark Boardman Callaghan, 1992.

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