Writing the Invention Disclosure

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    Rev. 1.1
WRITING THE INVENTION DISCLOSURE ................................................................. 1
Overview ............................................................................................................. 3
Pulling it Together- Writing your Invention Disclosure ........................................ 3
Suggested Title of the Invention .......................................................................... 5
Background of the Invention ............................................................................... 6
Drawings ............................................................................................................. 8
Brief Summary of the Invention ................................................................. Error! Bookmark not defined.
Brief Description of the Drawing ..................................................................... 10
Detailed Description of the Invention ............................................................. 11
Selected 35 USC §112 (1) Issues- (advanced) ..................................................... 19
Overview

This chapter will step you through creating each part of the invention disclosure, providing relevant information to help assure that your patent application meets the legal requirements of §112 (1), especially towards supporting the broadest claim scope possible. The text has been excerpted and adapted from our Provisional Patent Kit. Some legacy may still exist and we appreciate your overlooking such out of context matter, and your feedback.

In general, the disclosure must meet the written description requirements of the first paragraph of 35 USC §112, and a drawing is necessary if needed to understand the invention per 35 U.S.C. §113. As pointed out throughout the previous chapters, the “do-it-yourself” independent inventor is strongly cautioned against taking these legal requirements lightly, at the risk of losing some, or all of your patent protection rights.

In short, when preparing an invention disclosure, it is always better to be safe than sorry. When in doubt, it is better to include more technical details than less. For inventions having significant commercial potential, the invention disclosure should be prepared with as much attention to detail as possible. The more valuable your invention might be, the more you have to be careful not to spend too little time describing your invention in detail including all of its aspects, advantages, and variations.

Pulling it Together- Writing your Invention Disclosure

Having set forth the necessary concepts in the foregoing sections of this chapter, writing the invention disclosure is simply a matter of compiling each pertinent section into one document. The quality of the patent will largely be determined by how well you write the detailed invention disclosure.

Writing Tips

1. Write in your own voice and style. There is no need to phrase things in a legal sounding matter. It is OK to write casually, in the first or second person (e.g., “I invented a . . .”). All that matters is that you describe, in clear terms, the information required (as indicated in this chapter) to support the utility application; all other matters of form, and not of substance, I can “clean up”
2. If you are having some difficulty organizing your thoughts into a flowing description, use a bullet list of the information points whenever possible, and where helpful, “glue” them together to make sentences.
3. Always describe and compare things in a positive, and affirmative manner; and, not by putting anything down, or being negative, especially about any aspect of your invention. For example, if version A of your invention does a function poorly, and version B does it better, it is better to say “version B does that function better than version A”, than to say “version A does that function poorly, and version B does it better.”
4. Perform a grammar and spell check of your write in your word processor application. You never know when a small typo could affect something substantial.

The Quick Approach – 10 Easy Steps

The more time you can spend reading this document in detail the better. However, not everyone can afford to spend the requisite time and effort. For those who cannot afford the time, at the risk of less quality, the following steps, in order, would be the minimal effort course of action:

1. Select a title according to the “Suggested Title of the Invention” (page 5) section of this chapter.
2. Answer the questions in the “Writing the Invention Background- Questions to Answer” section of this chapter (page 7). Be sure to list the known problem(s), or need(s), and known solutions.
3. Also, read the “Satisfying the Written Description Requirement- a Checklist” section of this chapter (page 12).
4. Create clear sketches or computer aided drawings complying with the “Drawings Checklist” (page 9) section of this chapter.
5. Describe each drawing, or figure, in accordance with the “Brief Description of the Drawing” (page 10) section of this chapter.
6. Answer as many questions as you can in the “Disclosure for the Specification” section of this chapter (page 14).

The Better Quality Approach

1. Select a title according to the “Suggested Title of the Invention” (page 5) section of this chapter.
2. Write a brief description of the known problem or need and known solutions according to the “Background of the Invention” section of this chapter (page 6).
3. Read and write your disclosure in accordance with the “Satisfying the Written Description Requirement- a Checklist” section of this chapter (page 12).
4. Create clear sketches or computer aided drawings complying with the “Drawings” (page 8) section of this chapter.
5. Briefly describe the nature and relevance of each drawing, or figure, in accordance with the “Brief Description of the Drawing” (page 10) section of this chapter.
6. Write a detailed description of the invention following the “Disclosure for the Specification” section of this chapter (page 13).
High Quality Invention Disclosure- A Template to Start From

[Insert the title of your invention here]
Inventor(s): [Insert the full name of the inventor(s)].

BACKGROUND OF THE INVENTION
[Describe and reference prior-art solutions according to the “Background of the Invention” section of this chapter (page 6).]

BRIEF DESCRIPTION OF THE DRAWINGS
[Briefly describe the general nature and relevance of each drawing in the application as indicated by the “Brief Description of the Drawing” section of this chapter (page 10); e.g.,
Figure 1 illustrates a flow chart of an embodiment of the present invention detailing the novel latch mechanism;

Figure 2 is a schematic diagram of a machine that implements the present invention according to an embodiment;

Figure 3 ...etc]

DETAILED DESCRIPTION OF THE INVENTION
[Describe the invention in complete detail as prescribed in the “Disclosure for the Specification” section of this chapter (page 13). Your description must completely comply with the “Satisfying the Written Description Requirement- a Checklist” (page 12) sections of this chapter.]

Suggested Title of the Invention
The title of the invention helps others refer to your application, especially if other information is lacking. In an issued patent, the title should help others quickly determine the field and nature of the invention. Such descriptive titles also help those searching for prior-art by keyword searches to more efficiently identify related patents to further investigate, out of a large number of search results. For this reason, some inventors try to make the title non-descriptive, or even misleading; in the hope of hiding their patent so that it is more likely that another may infringe, and pay royalties. Of course, the USPTO frowns on this behavior.

There are a few guidelines set forth by the USPTO in writing the title of the invention, they are:
1) The title may not exceed 500 characters in length;
2) The title must be as short and specific as possible;
3) Characters that cannot be captured and recorded by automated information systems should be avoided, as they may not be included in the USPTO records.
Background of the Invention

Even though in an invention disclosure the “Background Art” section is optional, it is useful to include to the extent that the detailed description of the invention may not sufficiently set forth the problem solved by your invention, and the prior-art field of your invention.

Part of defining the scope of your invention is to indicate what is, old, and not part of your invention. The Background section of the disclosure accomplishes this. The background section of the disclosure is split into two subsections, namely: “Field of the invention,” and “Background Art”. The “Field of the Invention,” or “Technical Field,” subsection is a statement of what general field of art that best covers the invention. This statement may be written by way of simple paraphrasing of the most encompassing U.S. patent classification that corresponds to the subject matter of the invention as claimed.

The “Background Art, or “Description of the Related Art”, subsection describes related prior-art that the applicant is aware of, and may include references to specific related art and problems, if any, involved in the prior art which are solved by the applicant’s invention. It is usually preferable to reference patents, or printed publications, that are particularly useful in either typifying the state of the prior-art that your invention directly addresses, or that show a specific prior-art solution to a problem your invention addresses.

When describing the Background Art you must keep in mind that anything you include here, even if by mistake, may be construed by the USPTO as an admission of prior-art that may be used against the patentability of your utility patent application. Therefore, only include matter this only a past solution, and do not discuss matter related to your solution. The same is true for any drawings you use to characterize the background prior-art. Figures showing past (prior-art) solutions should be clearly marked as “Prior-art” in the figure’s title. Do not reference any figures showing your invention in the Background Art section. The Background Art section is a good opportunity to frame the context of your invention so that potentially novice readers can clearly identify your invention’s main area of utility with respect to specific areas and problems within a technical field. After reading Background Art section, you should have a strong sense that there is an important problem, that requires a better solution, such as something like the general nature of your invention, but do not be specific on how to do it, leave that for the detailed description of the invention.

You should be aware, however, that although you may characterize the general state of the prior art and how your invention is an advancement, the USPTO does not permit you to make derogatory remarks concerning the inventions of others. Derogatory remarks are statements disparaging the products or processes of another person. To be clear, simple comparisons with the prior art is not considered to be disparaging. The USPTO also does not permit you to make statements concerning the merits or validity of applications or patents of another person.

Invention Background Writing Checklist

✓ You should reference and briefly characterize patents, or printed publications, that are particularly useful in either typifying the state of the prior-art that your
invention directly addresses, or that show a specific prior-art solution to a problem your invention addresses.

- Nonpatent literature (e.g., periodicals) must have verifiable date of public accessibility.
- Anything you include in the Background Art section, even if by mistake, may be construed by the USPTO as an admission of prior-art that may be used against the patentability of your utility patent application.
- **DO NOT** describe anything about the novel aspects of your invention.
- Figures showing past (prior-art) solutions should be clearly marked as “Prior-art” in the figure’s title.
- Do not reference any figures showing your invention in the Background Art section, and certainly do not mark them as “Prior-art.”
- You should frame the context of your invention so that potentially novice readers can clearly identify your invention’s main area of utility with respect to specific areas and problems within a technical field.
- The USPTO does not permit you to make derogatory remarks concerning the inventions of others.
- The USPTO also does not permit you to make statements concerning the merits or validity of applications or patents of another person.

**Writing the Invention Background- Questions to Answer**

The Background of the Invention should be written in accordance with the principles set forth above. Note, that it may be helpful to perform a prior-art search to characterize the prior-art. One should be sure the Background section at least answers the following questions:

1. What is the technical field of the invention?
2. What is the most related and most recent state-of-the-art (before your date of invention) illustrating the nearest solution(s) to the problem or need addressed by your invention, as disclosed and claimed?
   - Briefly, but sufficiently, describe such that a person not in the field of your invention would understand the problem or need.
3. In what way have others solved the same or very similar problem(s) solved by your invention?
4. Has the design, or any part of it, been in prior use, possibly for a different application or purpose?
5. Which printed publications, if any, best characterize the background of the invention? Preferably, you should reference U.S. patents when possible. However, any published patent or patent application is acceptable. Non-patent print publications (e.g., periodicals) are also acceptable; however, they must have a clear date of when they were publicly available. Anything referenced should be briefly characterized to demonstrate how others approached the problem, and the reference is used as an example of that characterization.
   - When a prior-art reference(s) discloses material that is essential to the understanding of your claimed invention, the documents will be incorporated by reference into the disclosure in a statement like
“a prior-art gear latch mechanisms is described in U.S. Patent No. 5,265,484, which is incorporated by reference into this application.”

6. Does the background art have any disadvantages or limitations?
7. How else have people accomplished the same function as your invention in the past?

**Drawings**

In an invention disclosure only informal drawings (e.g., hand sketches) are required, and formal drawings (i.e., complies with USPTO rules) are accepted. It is not usually a good idea pay the upfront cost of formal drawings, as they are not required. Hence, it is sufficient to submit informal drawings with your invention disclosure. However, do not confuse the word ‘informal’ with ‘insufficient’. The drawings must be sufficient in the sense of supporting disclosure to satisfy written description requirement of 35 USC §112 (1) (see the “Satisfying the Written Description Requirement- a Checklist” section below). Informal drawings do not have to be pretty (i.e., they can be drawn neatly by freehand with a ruler), but they must disclose the invention to the extent referenced by the patent specification (spec) or otherwise required to understand the invention. The drawings submitted with the invention disclosure should clearly show every detail about your invention. That way, if the written disclosure is somehow lacking, the drawings can makeup for it. Most inventors can prepare informal drawings that are clear enough to show another in their field what they have invented, how it is used, and how the elements of the drawing are connected. However, if your invention is so complex (e.g., 3-D exploded views of many parts), and difficult to draw so that others would understand the invention from the drawings, then professional drawings services should be considered. Typically, complex formal drawings cost between $90-160.

**General Information**

1. Figures marked “prior-art” are an admission by the applicant that what they are is prior-art relative to applicant’s invention. A figure should only be labeled “prior-art” if it actually is a past solution, and should be located in the “Background of the Invention” section.
2. Original filed drawings may be either formal or informal.
3. Formal drawings:
   a. are stamped “approved” by the USPTO Draftsperson; and
   b. Are not required until the patent is printed.
4. A substitute drawing is usually later submitted to replace an original informal drawing.
5. A drawing may be declared as informal by the applicant when filed.
6. Drawings are required if they are necessary or helpful to understand the invention.
7. No new matter may be added after filing.
8. The filing date of the invention disclosure is not affected by the lack of a drawing because it is an informality. Note: If the written disclosure was inadequate, and no drawing was submitted, then the original filing date of the patent is lost.
9. Note: drawing proportions are not evidence of actual proportions when drawings are not to scale.
**Drawings Tips**

1. As a guide, see the figures in the sample patents included in Appendix D.
2. Whenever practical use computer software applications such as Microsoft Visio or Word, Adobe Illustrator, Macromedia Freehand, and CoreDRAW to create your drawings.
3. If you have a physical example of something that is hard to draw on the computer, use a camera to capture the image. If it is a digital camera, you can directly import the image into the software. Then, you will want to trace out the edges of the image for use as the informal patent drawing. If you have an application such as Adobe Photoshop, you can automatically trace out the objects edges by using a tool called “edge detection.” If it is a film camera, you can either scan the picture and process it as previously indicated, or place tracing paper over the picture and trace out the edges of the object.
4. When numbering items in a figure, choose numbers that will not be confused with figure numbers. It is a good idea to number items using consecutive even numbers, for example, so that new elements may be included without disruption the numbering scheme.
5. Place the part or step numbers as close to the element such that it does not interfere with the figure, and draw a line from the number to the element when the correspondence is not obvious.
6. For inventions involving a process, use a flowchart that clearly shows and numbers each step in the process, and how the process flows from one step to the next, starting from some initial state, and progressing from one state to the next.

**Drawings Checklist**

- ✔ Use permanent ink to draw all drawings.
- ✔ All drawings should be in the following high-resolution format (.tif, .gif, or jpg) as required by the USPTO: 300 dpi, Black & White, 8 ½ x 11 in.
- ✔ Uniquely number each drawing sheet at the top, indicating the current sheet number out of the total number of sheets, e.g., 1/5, 2/5, 3/5, …etc.
- ✔ Label each Figure with sequential numbers (e.g., Figure 1, Figure 2, …etc.). More than one figure may be on a sheet. For figures that are very related, use letter suffixes such as Figure 1A, Figure 1B, …etc.
- ✔ Do not label any drawing of your invention as “Prior-art”
- ✔ Label as “Prior-art” anything that shows known, past solutions that you are using as background information.
- ✔ Make sure that the figures of your invention completely show all aspects, parts, and/or steps of the invention.
- ✔ All parts and/or steps of the invention should clearly identified with numbers, and completely describe each numbered part or steps in the detailed description. Every time a numbered drawing element is described, it should include the numeric identifier used in the drawing (e.g., “In Figure 1, the crossbeam 10 is connected to frame support 20 by fastener 30”)
✓ Include in the drawings any interrelationships between parts or sequencing of steps.
✓ Show and number any hidden features of the invention.
✓ Show and number any environmental or usage components that show the context of your invention. For example, if the invention is software, then show the computer architecture of the system that runs the software; or if the invention if it is a type of payload lifting mechanism, show all other structures that support or interact with the lifter, and the typical types of payloads the lifter will lift.

**Selected Issues (advanced)**

1. Omitted figures that are needed to understand a claim cannot be added after the filing date; however, to keep the filing date the applicant must file a preliminary amendment before the first office action in the utility application deleting all spec references to the omitted figure and the delete the claim.
   - If claim and references are not deleted, the examiner will require the drawings within a set period (at least 2 months) after mailing the notice. The filing date accorded is when drawing received at the USPTO.
2. After the application is filed, drawings may not be used to:
   a) to overcome any insufficiency of the spec, or
   b) to add to the original application regarding claim scope.
3. Drawings and pictures can be used against your claims during examination if they clearly show the structure which you claimed. However, the picture must show all the claimed structural features and how they are put together.

**Brief Description of the Drawing**

It is required to reference every drawing in the application; this is good opportunity to be sure that the relevance of every drawing, if any, is correctly described. The basic format is to describe separately each included drawing and their respective relevance to the invention as described in the detailed description. The description must refer to the different views by specifying the numbers of the figures (e.g.; Figure 1, Figure 1a, or etc.), and preferably set forth the type of view used in each drawing. For example, “Figure 1 illustrates a plan view of the automatic dispensing mechanism according to an embodiment of the present invention.” Typical views include plan, elevation, section, and perspective views. Detail views of subparts of a figure, shown on a larger scale, are also used. However, in an invention disclosure, correctly naming the type of view it is not important, as it is not substantial and can be corrected in the utility application without adding any new matter. What is important, though, is that you accurately establish the relevance of the drawings.
Detailed Description of the Invention.

Introduction

The detailed description sets forth a specification that must efficiently enable an ordinary person in the related art to make and use your invention in the best way, without requiring undue experimentation, in accordance with 35 USC §112 (1) (the Written Description Requirement), as recited below:

“The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.”

The intuitive, plain meaning of this law is generally instructive enough to convince most nonpractitioners that they should make sure to explain their invention in substantial detail. The intent of the present chapter is to help you write an invention disclosure that provides us enough detailed information so that we can prepare the best quality patent application possible based on your disclosure.

By preparing an invention disclosure according to the information in this chapter, you will virtually always get a better quality patent application than if you gave your patent practitioner only a basic disclosure.

Overview

Throughout patent law there is an often-used concept of someone that has “ordinary skill in the art.” It is important to understand what this phrase means. In a basic sense, a “person of ordinary skill in the art” means an ordinary, or average trained, worker in the field or science that is closest to that of the invention being evaluated. Most interpretation of what is ‘enough’, ‘sufficient’, or ‘acceptable’ for the written description and claims is based on what someone of ordinary skill in the art would understand. In this context the invention disclosure must set forth the manner and process of making and using it such that it satisfies 35 USC §112 (1) (see introduction above); wherein the invention disclosure must be written in very precise and clear manner such that the exact inventive step is disclosed so that it enables anyone of ordinary skill in the art to make and use your invention without having to perform an unreasonable amount of experimentation. The invention disclosure must also clearly distinguish your invention from other inventions and from what is already known in the public domain (i.e., prior-art). It must also describe completely a specific version, or embodiment, of the invention (i.e., a process, machine, manufacture, composition of matter or improvement), and must also set forth, when ever possible, its principles of operation. At least one embodiment demonstrated in the invention disclosure must be the version that the inventor regards as the best way to carry out his or her invention. When the invention is an improvement on a prior invention, the invention disclosure must
identify the part(s) of the invention that were improved, and should only describe the specific improvement and related aspects or other information that may be necessary for a complete understanding of the improvement.

Satisfying the Written Description Requirement- a Checklist

- Completely describe every conceivable aspect, element, interrelationship, variation, and application of the invention.
- When describing the applications of the invention, be sure to clearly set forth what the invention accomplishes in each application, and how these accomplishments, or results, are achieved in each case.
- Include with the invention disclosure detailed drawings that clearly depict the invention as expected to be claim. Each variation, or embodiment, that you seek protection on should be separately shown and described in detail.
- Include an embodiment that is the most general version, or embodiment, of your invention. The most general embodiment is one that has the least number of elements required for you to regard it as still satisfying the spirit and novelty the preferred version of your invention, but possibly not optimally. Disregard how well it works, just as long as the most general embodiment would be useful to someone, in some way, novel, and not obvious over past solutions.
- Describe in detail, examples or the actual reduction to practice (i.e., an actually working implementation of the claimed invention or embodiments) of a representative number of embodiments (i.e., version) of the invention. The number of embodiments should be representative of, or cover, all the main versions of the invention that would be necessary to directly apply to the broad category, or genus, that invention belongs to. For example, if you invented a new and very different function for use with a chair, and because there is high variation within the broad chair category, or chair genus, then you must show enough examples, or embodiments, that show all the ways your new chair feature may be adapted to all the many different chairs in existence. Otherwise, a broad claim in the utility application could be rejected, and even if it, somehow, makes it past the examiner, your invention may be later construed in the courts to apply only to a much smaller scope of chairs, the kinds you showed, and not all chairs.
- Similarly, make sure that you include detailed drawings and descriptions for a representative number of variations of the invention. Again, if the inventions belong to a category where there is a relatively large number of different ways of solving the problem in the public domain, then you must include enough variations, or embodiments, of the invention such that a person of ordinary skill in the art would recognize from the disclosure that you understood, and the embodiments capture the necessary common attributes or features existing in the various related implementations found in the invention’s category. Similar to the previous example, if you invented a new kind of chair, then because there are so many variations and features in the chair category, to get broad protection you must disclose enough embodiments, in enough detail, to convey how your new chair compares to all the known types of chair and their distinguishing features. If an insufficient number of embodiments or features are disclosed in the written
description for a broad claim, the Examiner may reject your utility application the
due to an inadequate disclosure.

✓ Avoid describing a feature or aspect of the invention using terms such as ‘critical’
or ‘essential’ unless the invention would be inoperable otherwise; because, such
statements may cause written description problems if the utility application
attempts to claim a broader scope that does not include the feature or aspect.

✓ To convince the Examiner that you have satisfied the written description make
sure that the invention disclosure is complete enough so that a person of ordinary
skill in the art would recognize from the disclosure that you were in possession
(i.e., in complete understanding) of the claimed invention. Factors the Examiner
considers (i.e., what you must describe) include any combination of the following
distinguishing and identifying characteristics:
  o Partial structures (i.e., elements of the invention),
  o Physical and/or chemical properties,
  o Functional characteristics (i.e., how the elements function),
  o Known or disclosed correlation between structure and function (i.e., how
    the elements work or interact with each other), and
  o Method of making- of the elements and/or invention is made.

Disclosure for the Specification

The following questions and suggestions are intended to help get you started in
developing the necessary content for the detailed description of the invention. Preparing
the detailed specification is often easier if it broken into single questions to answer or
actions to take. You should respond to each question or action in the context of the above
discussion regarding the written description requirement. After responding to the below
questions and actions, you should be able to glue your responses together into one
coherent story, and call that a draft, detailed description of the invention for your
invention disclosure.

General Writing Style Suggestions

In writing the disclosure you should go beyond the specific design, or prototype
you have been working on or perfected. Instead, you should try your hardest to explain
things in generic terms and as abstractly as possible, then give specific examples
(possibly the ones used in your prototype) for each generic element or version described.
Try to push the envelop in how much you generalize; e.g., generalize up to the point
where if you changed or generalized something any further, you would not regard the
result as your invention any longer. When generalizing your invention, do not worry
about it making you invention less desirable or less effective, just as long as it is still
useful, novel, and not obvious over past solutions. The goal is to build a tall and wide
wall that will block others from designing around your invention and its obvious, and/or
not so obvious, variations.

If you have any existing documents that describe or show the invention; such as
Thesis/Dissertations, reports, articles, drawings/diagrams, and etcetera your should
include the pertinent sections to the extent that it supports the overall disclosure at a level
of detail sufficient to show an ordinary person in the field of the invention how to make
and use the invention. You should think of the disclosure as a story that paints a picture conveying a logical, simple, and coherent flow, and must act as a technical specification instructing others in the field on how to make and use the invention. When in doubt about how much detail to include, it is better to err on the side of including the details, especially if they would show someone how to make or use the invention, or show its operability, or substantiate controversial or not well-known statements or parameters, etc. It is unnecessary to include information or data not preferential to your invention or application, as long as what you do disclose is true and accurate.

The background section described the general problem(s) to be solved, prior-art solutions and inadequacies, and how the characteristics or benefits of your invention are needed. The invention disclosure should flow right from the background in such a way that the invention disclosure first introduces the invention as an answer to the background section’s problems and needs, and then continues to describe implementation details, followed by some conclusions and generalizations. Accordingly, the below questions and suggestions are grouped into three categories: an Introduction, Implementation Details, and Conclusion. These categories are not headings to be used in the draft, but, instead, are only meant to help you appreciate how the questions and suggestions are organized into a sequential flow.

**Introduce the Invention- Questions and Guidelines**

The Introduction part of the detailed disclosure establishes the context of the invention with respect to the prior-art and industry. Your responses to the following items should be brief, very relevant, and accurate.

1. What is the purpose of the invention?
2. Briefly describe the general nature, or gist, of what is novel, in form or function, about the invention.
3. What problem(s) does your invention solve?
4. Establish the advantage(s) and/or benefits of the invention over current solutions.
   Bear in mind, however, that inventions do not necessarily require explicit advantages to be patentable; they, generally, they just have to be novel, nonobvious, and useful.
5. Who would be interested in, or want to use your invention?
   Focus especially on the commercial aspect of use or interest by others.
6. Describe what the desired characteristics of the invention are.
   For example, “one desired characteristics of the invention is to improve yield at low temperatures. …Another desired characteristics of the invention is to increase tensile strength without increasing weight.” …and etc. There is no need, and, is indeed not desirable any more, to explicitly declare the “objects” or “goals” of the invention.

**Implementation Details- Questions and Guidelines**

After introducing the invention to you, proceed to describing the invention such that it supports the overall disclosure at a level of detail sufficient to show an ordinary person in the field of the invention how to make and use the invention in all its possible forms. Follow a logical and sequential flow that takes one of two description approaches: top-down, or bottom-up. In a top-down approach, the detailed description starts from the
topmost concepts or level (e.g., system level) and gradually works its way down to the
lowest levels (e.g., component level). In a bottom-up approach, the reverse is performed;
that is, the description begins from the lowest levels and proceeds gradually upwards to
the topmost level.

The detailed description of the invention should never describe prior-art in any detail,
except to the extent required to understand how it relates and contributes to the novel
parts or workings of the invention. Also, try to use consistent, and especially not
contradictory, terminology throughout the complete invention disclosure. Usually, the
embodiment described first and in the most detail will be the best, most commercially
viable one, (i.e., the best mode) followed by the other alternative embodiments.

7. Completely describe the environment (i.e., larger structures that the invention is part
of; e.g., for a loudspeaker, “a loudspeaker inside a loudspeaker enclosure connected
to an audio amp…,” …etc) and context (e.g., the loudspeaker is used with an amp to
play sounds, like music, for entertainment…) that the invention functions within.

8. Clearly define all terms that are used in a way that is non-standard in the field of the
invention. You area allowed to define and use a term in any way, however, you
should not define a term such that it contradicts, of would otherwise completely
mislead, the meaning ordinary people in the art would give that term. Hence, you can
be your own “lexicographer” (i.e., write your own dictionary), but only up to the
point where your definitions become “repugnant” to meaning understood by those in
the art.

9. Separately describe, in detail, multiple versions, or embodiments, of the invention
that are substantially different enough to require separate treatment. Include all
embodiments that you know of so that you can have maximal protection later. These
embodiments will support the independent claims. If you are unsure of what
embodiments you should include, it may be useful to search the public domain (e.g.,
the internet, patents, periodicals, etc.) for the range of applications your invention
would apply to, and be sure to describe an embodiment for each application of your
invention that would require some substantial change or reconfiguration.

10. For each element and aspect of each embodiment of the invention, separately provide
a clear identification and complete description that sets forth the operation, function,
interconnection, and interrelation of all elements of the invention.

✓ Describe in detail how to make and use the invention, at a level of detail that
ordinary people in the field of the invention would understand.

✓ When applicable, briefly describe why you made certain definitive choices that
lead to a better solution, especially if those choices were counterintuitive. If there
are other ways to accomplish the same result, briefly describe those other options
if they are not distinct enough to be separate embodiments described in detail.

✓ Elements or steps uniquely identified and enumerated in a drawing should be
referenced by the same designation in the corresponding detailed description.

✓ Make sure it is clear how each element makes its contribution to the invention.

✓ Identify any elements that are prior-art (i.e., old, conventional, or used in expected
ways). You do not need to describe how these work separately, but only how
they contribute to the invention.

✓ For informal drawings (e.g., a hand sketch), use labels to uniquely identify and
enumerate all elements of your invention wherever possible. Make sure all
essential elements are shown in the sketch.

✓ Avoid including extraneous detail such as measurements and equations, unless they would help an ordinary person in the art make or use the invention. However, an important case when it is important to include experimental data is to prove an “actual reduction to practice” (ARTP) (i.e., a built and working implementation) to help win a “first-to-invent” competition. If you have a working implementation, “hedge your bets” and include the data that evidences your ARTP. In general, if you have any doubt, just include the information in the disclosure, and, then, I will decide what portion, if any, to include in the utility application. More disclosure is better than less in an invention disclosure.

11. Describe and include any experimental data, material specifications, or other technical information that may:
   a. help prove that you had a prototype;
   b. be necessary for ordinary people in the art make and/or use the invention;
   or
   c. be required to support future claims, if this data is part of what you wish to protect;

12. Completely describe what the invention embodiments generate, consume, and the way they are powered.

13. Separately describe the most basic version, or embodiment, of the invention that has the least number of elements or constraints as possible, while still maintaining the spirit, usefulness, and basic advantage (even if greatly reduced) of the invention. The broadest Independent claim will be based on this embodiment.

14. Describe any elements or constraints that are absolutely required, or essential, to the invention, where if any one of them were not included, the invention would be disabled. Be sure that the essential elements or constraints are all included in the most general, or basic, embodiment described above.

15. Separately describe the best version of your invention, but do not characterize it as best, just include it.

16. For at least one embodiment, present, some examples of the invention that are either hypothetical/prophetic (predicted behavior) or functioning (actually working), which show how to make and use the invention. This is especially important to do in unpredictable fields of art to help satisfy the enablement requirement.

17. Does the invention have any important or preferred constraints? These constraints should fill in the significant elements and aspects that you only described in general terms in the most general embodiment. These constraints will support dependent claims. Such as:
   ✓ Steps or elements that must be, or you prefer to be, included or otherwise the invention would be less desirable, or not exactly what you had in mind.
   ✓ Operational constraints, or optimal operating ranges (e.g., a weight, size, temperature limit, pressure range, etc)? If so, identify them as such, and describe them completely for each version of the invention. Go into more detail if you suspect there is possibly any similar prior-art.
   ✓ A particular kind of substance, or group of substances.

18. Does the invention have any possible problems or modes of inoperability?
   Do not confuse poor performance with inoperability. If some aspect(s) of your
invention completely does not work (i.e., is inoperative) in certain situations, then you are only obligated to not say or claim that it does work in those situations. Otherwise, it is generally, preferable to only describe briefly problematic areas (including poor performance) if it is necessary for an ordinary person skilled in the art of the invention to understand how to properly make and use the invention. Be very careful, indicating anything negative about your invention could expose the utility application or any resulting patent, to receiving substantially less scope of infringement protection. Ask me if you are unsure.

19. Clearly distinguish the invention from current solutions by comparing the substantial corresponding characteristics, and by describing the unique features and aspects of your invention.

**Caution:** you must describe exactly what differentiates the invention from past solution. You cannot simply imply that your invention is "better," you must specifically describe how it is different and/or better.

20. Imagine the situation where another has already patented your invention, and you must find a work-around that would modify your current design to achieve a similar solution, advantage, and cost, but the modifications are such that they do would not be covered by the current way you plan to protect key structures or methods in the claims (i.e., find a work-around that would not infringe your own-expected- claims). Usually, there are many ways to achieve similar results by changing one or more elements of an invention. Hence, describe all design variations that could be commercially useful. These alternative embodiments will support independent and/or dependent claims. Be sure to:

- **Add minor** changes to a prior embodiment as alternative, almost parenthetical tweaks; e.g., “In embodiment 1 the rigid frame is made of a metal such as steel, in other embodiments of the present invention rigid materials such as plastic may be used instead…”
- **Add major** changes to a new, alternative embodiment as; e.g., “In an alternative embodiment, the rigid frame is replaced with a non-rigid support structure made of a flexible material such as rubber…” In this case, it is assumed that a non-rigid frame substantially affects the operation of the invention as a whole, and requires separate treatment in an alternative embodiment.
- **Discuss any possible combination, alteration, or removal of any parts, steps, or their corresponding functions.**
- **When ever possible,** in addition to using specific descriptive terms, identify the most generic terms possible for all parts, or steps (e.g., “a flat surface, such as a table, is used to…” instead of “a table is used to..”), or “a fastener, a nail for example, holds together…” instead of “a nail holds together….”
- **Consider whether anything** that could be added to improve the invention’s advantage or benefits.
- **Think about parts, steps, or functions** that could be removed while retaining some useful results, even if not good results.
- **Discuss ways** that parts, or steps, might be changed, or substituted with equivalent parts, or steps, without fundamentally altering the invention.
**Conclusion- Writing Tips**

After describing all the major embodiments in detail, there will be yet many changes and modifications that did not warrant separate treatment, or were not in your primary focus, but, could never-the-less be valuable. This is a good opportunity to include a ‘catch-all’ paragraph, which includes the small, but not yet described, variations in structure, steps, applications, or any other aspect of the invention that one in the art might imagine doing with the invention. Typically, these alternatives are ones that you may not have not spent much time on (in thought or design), and, thus, have little detail to offer, except to say that you are aware that an alternative is possible, and it is anticipated by the invention.
**Selected 35 USC §112 (1) Issues- (advanced)**

All provisional and utility applications must satisfy the written description requirement set forth by 35 USC §112 (1) (§112 (1) ). This section of law is rather complex and must be understood in significant detail to assure the requirements are met. Unlike many other specification issues that affect the validity of a patent as tested in the courts, problems with §112 (1) may arise upfront during examination of the utility application, and result in rejected claims in a Utility Patent, or losing an earlier provisional filing date, or even worse, losing all patent rights to the invention if a §102 (b) bar date event occurred. In any case, it behooves all independent inventors to understand to as much detail as is practical. To that end, some more advanced information regarding §112 (1) is presented below in an enumerated list format, having no particular order, for ease of review.

**Written Description Requirement**

1. An invention is not considered adequately described if an essential claimed feature is not described in the specification and is not conventional in the art.
2. Lack of possession of the invention may be indicated when the applicant requires an essential, and not described feature in the original utility application claims, and the feature is not conventional in the art.
3. Failure to provide an adequate written description need not rise to the level of active concealment or grossly inequitable conduct to reject a claim or invalidate a patent.
4. Means of showing possession (i.e., sufficient intellectual understanding) of the invention may be shown by:
   a. describing an actual reduction to practice (ARTP) of the claimed invention; and,
   b. such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention.
5. Before the Examiner can reject a claim based on §112 (1), the Examiner must:
   c. determine what is the invention;
   d. assume that the best mode is disclosed unless there is evidence to the contrary;
   e. determine whether:
      i. the inventor knew that one mode was better than another, and
      ii. whether the specification enables an ordinary person skilled in the art to practice the best mode.
6. One specific example in the specification is not evidence that the best mode was shown.

**Enablement**

1. Enablement of the disclosure depends solely on the disclosure enabling the full claim scope.
2. An inoperative embodiment(s) within a claim’s scope is not necessarily nonenabling.
The standard is whether a skilled person could determine which embodiments, possibly not yet made, and would be inoperative or operative with a normal amount of effort.

3. It is acceptable to have a defective instance, or embodiment, in a broad class (genus) claim, if there is a sufficient number and quality of embodiments to substantiate claiming the genus.

4. Enablement is found only in the specification of the disclosure in a utility application, and never in the claims.

5. The evidence provided by the applicant need not be conclusive but merely convincing to one skilled in the art.

6. An incorrect theory of operation is unpatentable for lack of 35 USC §101 utility and 35 USC §112(1) enablement.

7. For enablement of compounds and compositions, one of ordinary skill in the art must be able to make or synthesize them.

8. For plant genetics enabling prior art, those of ordinary skill in the art must be able to grow the plant.

**Undue Experimentation (Test of Enablement)**

Evidence that an ordinary person skilled in the art can make and use an invention without undue experimentation, includes the following factors:

a) The breadth of the claims;
b) The nature of the invention;
c) The state of the prior art;
d) The level of ordinary skill;
e) The level of predictability in the art;
f) The amount of direction provided by the inventor;
g) The existence of working examples; and
h) The quantity of experimentation required to make or use the invention based on the specification.
New Matter

1. If the new matter is in a claim of a utility application, the Examiner will reject the claim based on 35 USC §112(1) because the claim recites unsupported elements.
2. If the new matter is in the specification, then the Examiner will make an objection based on 35USC §132.
3. If the specification states that a device inherently includes or does something, then the application may be amended to recite the inherent material without adding prohibited new matter.
4. However, to establish inherency, the explicit evidence must make clear that the missing matter is necessarily present in the matter described, and that persons of ordinary skill in the art would recognize it.
5. Inherency cannot be established by probabilities or possibilities.