Utility Patent Application Filing Guide

Introduction

The United States Patent and Trademark Office (USPTO or Office) is the government agency responsible for examining patent applications and issuing patents. A patent is a type of property right. It gives the patent holder the right, for a limited time, to exclude others from making, using, offering to sell, selling, or importing into the United States the subject matter that is within the scope of protection granted by the patent. The USPTO determines whether a patent should be granted in a particular case. However, it is up to the patent holder to enforce his or her own rights if the USPTO does grant a patent.

The purpose of this guide is to provide you with basic information about filing a utility patent application. A patent application is a complex legal document, best prepared by one trained to prepare such documents. Thus, after reviewing this guide, you may wish to consult with a registered patent attorney or agent. Additional information is available:

by calling the USPTO's Contact Center at 800-PTO-9199 (800-786-9199)

on the USPTO website **www.uspto.gov**

at a Patent and Trademark Resource Center (PTRC) as explained below.

There are three types of patents: utility, design, and plant. There are two types of utility and plant patent applications: provisional and nonprovisional. A provisional application is a quick and inexpensive way for inventors to establish a U.S. filing date for their invention, which can be claimed in a later-filed nonprovisional application. A provisional application is automatically abandoned 12 months after its filing date and is not examined. An applicant who decides to initially file a provisional application must file a corresponding nonprovisional application during the 12-month pendency period of the provisional application in order to benefit from the

earlier provisional application filing. A nonprovisional application is examined by a patent examiner and may be issued as a patent if all the requirements for patentability are met. Each year the USPTO receives more than 500,000 patent applications. Most of the applications filed with the USPTO are nonprovisional applications for utility patents.

This guide contains information to assist you in filing your nonprovisional utility patent application. It specifies the required parts of the utility patent application and identifies some of the forms you may use (available on the USPTO website at **www.uspto.gov**). This information is generally derived from patent laws and regulations found at Title 35 of the United States Code (U.S.C.), and Title 37 of the Code of Federal Regulations (CFR). These materials, as well as the *Manual of Patent Examining Procedure (*MPEP*)*, are available at the USPTO website, at PTRCs, and at most law libraries.

Please contact the USPTO's Contact Center, browse the USPTO's website, or visit a PTRC if you have questions about:

- other types of patent applications
- locating a patent attorney or agent
- obtaining the most up-to-date fee schedule
- obtaining copies of other USPTO publications

Nonprovisional Utility Patent Filing Options

A nonprovisional utility patent application can be filed with the USPTO through the Office's electronic filing system called EFS-Web, delivery by U.S. mail, or hand delivery to the Office in Alexandria, Virginia. By far, most patent applications filed at the USPTO are utility applications. Effective November 15, 2011, any regular nonprovisional utility application filed by mail or hand-delivery will require payment of an additional $400 fee called the "non-electronic filing fee," which is reduced by 50 percent to $200 for applicants that qualify for small entity status under 37 CFR § 1.27(a) or micro entity status under 37 CFR 1.29(a) or (d). **The only way to avoid paying the additional $400 non-electronic filing fee is by filing the nonprovisional utility application via EFS-Web.** The non-electronic filing fee does not apply to reissue, design, plant, or provisional applications. EFS-Web is a Web-based patent application and document

submission system in which anyone with a Web-enabled computer can file patent applications without downloading special software or changing document preparation tools and processes. More information is available at **www.uspto.gov/patents/process/file/efs/index.jsp**. Full technical support for EFS-Web is available through the Patent Electronic Business Center by calling 866-217-9197 from 6 a.m. to 12 midnight Eastern Time, Monday through Friday, except federal holidays.

Application Requirements

When filing a nonprovisional utility patent application, it must be submitted in the English language or be accompanied by a translation in the English language, a statement that the translation is accurate, and have payment of the fee set forth in 37 CFR § 1.17(i). If an applicant files a nonprovisional utility application in a language other than English without the translation, statement, or fee, the applicant will be given a notice and time period to submit the missing item(s).

A nonprovisional utility patent application must include a specification, including a description and a claim or claims; drawings, when necessary; an oath or declaration; and the prescribed filing, search, and examination fees.

EFS-Web accepts electronic documents formatted in Portable Document Format (PDF). The specification (description and claims) can be created using a word processing program such as Microsoft® Word or Corel® WordPerfect. The document containing the specification can normally be converted into PDF format by the word processing program and can be included as an attachment when filing the application via EFS-Web. Other application documents, such as drawings and a hand-signed declaration, may have to be scanned as a PDF file for filing via EFS-Web.

Each document can be created in a PDF format for filing via EFS-Web must have a top margin of at least 2 cm (3/4 inch), a left-side margin of at least 2.5 cm (1 inch), a right-side margin of at least 2 cm (3/4 inch) and a bottom margin of at least 2 cm (3/4 inch). The application pages must be numbered consecutively (centrally located above or below the text) starting with page one. In addition, the PDF document size should be 8.5 inch by 11 inch (standard size) or 21 centimeter

by 29.7 centimeter (DIN size A4). The specification, including the abstract and claims, must have lines that are 1.5 or double-spaced in a single column of text. The text must be a nonscript font (e.g., Arial, Times Roman, or Courier), preferably with a font size of 12. Handwritten text scanned into PDF format is not acceptable.

A complete nonprovisional utility patent application should contain the elements listed below, arranged in the order shown. Description of these elements is provided in the following sections:

- Utility Patent Application Transmittal Form or Transmittal Letter
- Fees
- Application Data Sheet (see 37 CFR § 1.76)
- Specification (with at least one claim)
- Drawings (when necessary)
- Executed Oath or Declaration
- Nucleotide and Amino Acid Sequence Listing (when necessary)
- Large Tables or Computer Listings (when necessary)

Utility Patent Application Transmittal Form or Transmittal Letter

A Utility Patent Application Transmittal Form (Form **PTO/AIA/15**) or a transmittal letter should be filed with a patent application to identify the items being filed (e.g., specification, claims, drawings, declaration, and information disclosure statement). The form identifies the applicant(s), the type of application, the title of the invention, the contents of the application, and any accompanying enclosures. (Form **PTO/SB/21** should be used for correspondence after THE initial filing.)

Fees

You can electronically submit the required filing, search, and examination fees using a credit card or electronic funds transfer. For example, when filing your patent application online via EFS-Web, it is better to pay these fees online when filing the application via EFS-Web rather

than later, because any filing, search, or examination fee paid on a date later than the patent application filing date requires a late surcharge of $140 ($70 for small entity applicants and $35 for micro entity applicants). The late surcharge will also be owed if you file the required oath or declaration on a date later than the application filing date, so it is best to ensure that the required fees and the oath or declaration are included with the specification (including claims) and drawings filed via EFS-Web. You can also file your nonprovisional utility application in paper by mail or by hand-delivery; however, this will cost you an additional non-electronic filing fee of $400 ($200 for small and micro entities) on top of the regular filing, search, and examination fees. If you file in paper, the Fee Transmittal Form (Form **PTO/SB/17**) may be used to calculate the prescribed filing, examination, and search fees, any excess claim fees or application size fee, and indicate the method of payment (by check, money order, USPTO deposit account, or credit card).

Although it is recommended to pay the filing, search, and examination fees online at the time of filing your application via EFS-Web in order to avoid the late surcharge, if you pay the fees later by check or money order, the check or money order must be made payable to the "Director of the United States Patent and Trademark Office." If an application is filed without the fees, the applicant will be notified and required to submit the fees plus the late surcharge within the time period set in the notice.

If your nonprovisional utility application filed via EFS-Web includes a total number of specification and drawing pages that exceeds 133, an application size fee will be due. (For applications filed in paper, an application size fee is due if the total number of pages exceeds 100 pages.) Further, if the application has more than three independent claims or more than 20 total claims, excess claims fees will be due. **Fees are subject to change, and the applicant should consult the current fee schedule before filing the application.** Normally, fees change every October.

Fee Discounts Based on Establishment of Small or Micro Entity Status

Most patent applicants pay regular undiscounted patent fees. However, fees for filing, searching, examining, issuing, appealing, and maintaining patent applications and patents are reduced by 50 percent for any small entity that qualifies for reduced fees under 37 CFR § 1.27(a), and are

reduced by 75 percent for any micro entity that files a certification that the requirements under 37 CFR § 1.29(a) or (d) are met.

- **Small Entity Status:** Applicant must determine that small entity status under 37 CFR § 1.27(a) is appropriate before making an assertion of entitlement to small entity status and paying a fee at the 50 percent small entity discount. Small entity status may be appropriate if the inventors have not assigned any rights in the invention set forth in the application and are not under any obligation to do so (as may be required in an employment contract). Note that by filing electronically via EFS-Web, the filing fee for an applicant qualifying for small entity status is further reduced. If you qualify as a small entity for patent fee purposes, no special form is required to claim your entitlement to reduced fees (you may check a special box on the transmittal form), but you should only pay small entity rates after ensuring that you qualify for the small entity status.

- **Micro Entity Status:** Applicant must determine that micro entity status under 37 CFR § 1.29(a) or (d) is appropriate before filing the required certification of micro entity status and paying a fee at the 75 percent micro entity discount. The patent forms Web page is indexed under the **Forms, Patents** section on the USPTO website. There are two USPTO micro entity certification forms, namely form **PTO/SB/15A** for certifying micro entity status on the "gross income basis" under 37 CFR § 1.29(a), and form **PTO/SB/15B** for certifying micro entity status on the "institution of higher education basis" under 37 CFR § 1.29(d). Because the certifications that must be made in order to be considered a micro entity are rather detailed, it is strongly recommended that the appropriate USPTO micro entity certification form be used to certify qualification for micro entity status.

Effective November 15, 2011, any regular nonprovisional utility application filed by mail or hand-delivery will require payment of an additional $400 fee called the "non-electronic filing fee," which is reduced by 50 percent (to $200) for applicants that qualify for small entity status under 37 CFR § 1.27(a) or micro entity status under 37 CFR § 1.29(a) or (d). **The only way to avoid having to pay the additional $400 non-electronic filing fee is by filing the regular nonprovisional utility application via EFS-Web**.

Application Data Sheet

Submission of an application data sheet (ADS) should be routine for all nonprovisional applications and is required in certain instances. For example, for applications filed on or after September 16, 2012, any domestic benefit claim(s) and any foreign priority claim(s) must be made in an ADS within four months from filing or 16 months from the filing date of the prior-filed application, whichever is later. See 37 CFR § 1.78 for information about domestic benefit claims and 37 CFR § 1.55 for information about foreign priority claims. Form **PTO/AIA/14** is the USPTO's ADS form for filing utility applications. See 37 CFR § 1.76 and MPEP § 601.05 for more information.

A corrected ADS may be filed to correct or update information in a previously filed ADS. In addition, even if an ADS was not previously filed, a corrected ADS must be submitted to make changes to information already of record. The corrected ADS is required to include underlined and strike-through text to reflect the changes: information that is being inserted must be indicated via underlining, and text that is being removed must be indicated via strike-through or brackets. However, certain information cannot be changed by simply filing a corrected ADS. For example, changes to the named inventors must comply with the requirements of 37 CFR § 1.48, correspondence address changes must comply with the requirements of 37 CFR § 1.33(a), and foreign priority and domestic benefit information changes must comply with 37 CFR §§ 1.55 and 1.78, respectively.

Specification

The specification is a written description of the invention and of the manner and process of making and using the invention that concludes with the claims to the invention, which must begin on a new page. The specification must be in clear, full, concise, and exact terms to enable any person skilled in the art or science to which the invention pertains to make and use the same.

For inventions involving computer programming, computer program listings may be submitted as part of the specification as set forth in 37 CFR § 1.96(b) and (c). Other than for a reissue application or reexamination proceeding, the pages of the specification (but not the transmittal letter sheets or other forms), including claims and abstract, must be numbered consecutively,

starting with 1, the numbers being centrally located above or preferably below, the text. The lines of the specification must be 1.5 or double spaced (lines of text not comprising the specification need not be 1.5 or double spaced). It is desirable to include an indentation at the beginning of each new paragraph and for paragraphs to be numbered (e.g., [0001], [0002], [0003], etc.).

It is preferable to use all of the section headings described below to represent the parts of the specification. Section headings should use upper case text without underlining or bold type. If the section contains no text, the phrase "Not Applicable" should follow the section heading.

Title of Invention

The title of the invention (or an introductory portion stating the name, citizenship, residence of each applicant, and the title of the invention) should appear as the heading on the first page of the specification. Although a title may have up to 500 characters, the title must be as short and specific as possible.

Cross-Reference to Related Applications

Any nonprovisional utility patent application filed after September 16, 2012 claiming the benefit of one or more prior-filed copending nonprovisional applications (or international applications designating the United States of America) under 35 U.S.C. §§ 120, 121, or 365(c), or to a provisional patent application under 35 U.S.C. § 119(e), must present the reference to the earlier application in an application data sheet under 37 CFR § 1.76. See 37 CFR § 1.78. Cross-references to other related patent applications may be made when appropriate.

Statement Regarding Federally Sponsored Research or Development (if Applicable)

This section should contain a statement as to rights to inventions made under federally sponsored research and development (if any). See MPEP §310 for more information.

Reference to Sequence Listing, a Table, or a Computer Program Listing Compact Disc Appendix (if Applicable)

Any material submitted separately on a compact disc must be referenced in the specification. The only materials accepted on compact disc are computer program listings, gene sequence listings, and tables of information. All such information submitted on compact disc must be in compliance with 37 CFR § 1.52(e), and the specification must contain a reference to the compact disc and its contents. The contents of compact disc files must be in standard ASCII character and file formats. The total number of compact discs including duplicates and the files on each compact disc must be specified in the specification.

If a computer program listing is submitted and is over 300 lines long (each line of up to 72 characters), the computer program listing must be submitted on a compact disc in compliance with 37 CFR § 1.96, and the specification must contain a reference to the computer program listing appendix. A computer program listing of 300 or less lines may be, but is not required to be, submitted on compact disc. The computer program listing on compact disc will not be printed with any patent or patent application publication.

If a gene sequence listing is to be submitted, the sequence may be provided on a compact disc in compliance with 37 CFR §§ 1.821-1.825, in lieu of submission on paper, and the specification must contain a reference to the gene sequence listing on compact disc.

If a table of data is submitted and the table would occupy more than 50 pages if submitted on paper, the table can be submitted on a compact disc in compliance with 37 CFR § 1.58, and the specification must contain a reference to the table on compact disc. The data in the table must properly align visually with the associated rows and columns.

Background of the Invention

This section should include a statement of the field of endeavor to which the invention pertains. This section may also include a paraphrasing of the applicable U.S. patent classification definitions or the subject matter of the claimed invention.

Also, it should contain a description of information known to you, including references to specific documents related to your invention. It should contain, if applicable, references to

specific problems involved in the prior art (or state of technology) that your invention is drawn toward. See MPEP § 608.01(c) for more information.

Brief Summary of the Invention

This section should present the substance or general idea of the claimed invention in summarized form. The summary can include the advantages of the invention and how it solves previously existing problems. Preferably, problems are identified in the **Background of the Invention** section. A statement of the object of the invention may also be included. See MPEP § 608.01(d) for more information.

Brief Description of the Drawings

Where there are drawings, you must include a listing of all figures by number (e.g., Figure 1A) and with corresponding statements explaining what each figure depicts.

Detailed Description of the Invention

In this section, the invention must be explained along with the process of making and using the invention in full, clear, concise, and exact terms. This section should distinguish the invention from other inventions and from what is old. It should also describe completely the process, machine, manufacture, composition of matter, or improvement invented. In the case of an improvement, the description should be confined to the specific improvement and to the parts that necessarily cooperate with it or that are necessary to completely understand the invention.

It is required that the description be sufficient so that any person of ordinary skill in the pertinent art, science, or area could make and use the invention without extensive experimentation. The best mode contemplated by the inventor of carrying out the invention must be set forth in the description. Each element in the drawings should be mentioned in the description. See MPEP § 608.01(g) for more information.

Claims

The claim or claims must particularly point out and distinctly claim the subject matter that the inventor or inventors regard as the invention. The claims define the scope of the protection of the patent. Whether a patent will be granted is determined, in large measure, by the scope of the claims.

A nonprovisional application for a utility patent must contain at least one claim. The claim or claims section must begin on a separate physical sheet or electronic page. If there are several claims, they must be numbered consecutively in Arabic numerals.

One or more claims may be presented in dependent form, referring back to and further limiting another claim or claims in the same application. All dependent claims should be grouped together with the claim or claims to which they refer to the extent practicable. Any dependent claim that refers to more than one other claim (multiple dependent claim) shall refer to such other claims in the alternative only. Each claim should be a single sentence, and where a claim sets forth a number of elements or steps, each element or step of the claim should be separated by a line indentation.

Abstract of the Disclosure

The purpose of the abstract is to enable the USPTO and the public to quickly determine the nature of the technical disclosures of your invention. The abstract points out what is new in the art to which your invention pertains. It should be in narrative form and generally limited to a single paragraph, and it must begin on a separate page. An abstract should not be longer than 150 words. See MPEP § 608.01(b) for more information.

Drawings

A patent application is required to contain drawings if drawings are necessary to understand the subject matter to be patented. Most patent applications contain drawings. The drawings must show every feature of the invention as specified in the claims. A drawing necessary to understand the invention cannot be introduced into an application after the filing date of the

application because of the prohibition against new matter. Please see the detailed **Drawing Requirements** section.

Oath or Declaration

An oath or declaration is a formal statement that must be made by the inventor in a non-provisional application, including utility, design, plant and reissue applications. Either form **PTO/AIA/01** or **PTO/AIA/08** may be used to make the required declaration in a utility application. It is preferred that applicants use form PTO/AIA/01, which must be filed together with an **application data sheet.** Each inventor must sign an oath or declaration that includes certain statements required by law and the USPTO rules, including the statement that he or she believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application, and the statement that the application was made or authorized to be made by him or her. See 35 U.S.C 115 and 37 CFR § 1.63. An oath must be sworn to by the inventor before a notary public. A declaration may be submitted in lieu of an oath. A declaration does not need to be notarized. Oaths or declarations are required for design, plant, utility, and reissue applications. In addition to the required statements, the oath or declaration must set forth the legal name of the inventor and, if not provided in an application data sheet, the inventor's mailing address and residence. In lieu of an oath or declaration, a substitute statement may be signed by the applicant with respect to an inventor who is deceased, legally incapacitated, cannot be found or reached after diligent effort, or has refused to execute the oath or declaration. Joint inventors who are the applicant may sign a substitute statement for an inventor who cannot be found or reached after diligent effort or has refused to execute the oath or declaration. However, joint inventors cannot sign a substitute statement for an inventor who is deceased or legally incapacitated. A legal representative of the deceased or legally incapacitated inventor or the assignee who is the applicant may sign a substitute statement for a deceased or legally incapacitated inventor. The assignee (or party to whom the inventor is obligated to assign the invention) who is the applicant may sign a substitute statement for an inventor who is deceased, legally incapacitated, cannot be found or reached after diligent effort, or has refused to execute the oath or declaration. Form **PTO/AIA/02** is the USPTO's substitute statement form for filing utility applications in these situations. When filing a continuing application, a copy of the oath or

declaration filed in the earlier application may be used provided that it complies with the rules in effect for the continuing application (i.e., the rules that apply to applications filed on or after September 16, 2012). The oath or declaration must be personally signed by the inventor, either with a handwritten signature (i.e., pen applied to paper) or an "S-signature" (a typed name or electronic image of a handwritten signature inserted between forward slashes on the signature line). Each inventor's legal name is required.

Any oath or declaration must be in a language the inventor understands. If the oath or declaration used is in a language other than English and is not in a form provided by the USPTO or provided in accordance with Patent Cooperation Treaty (PCT) Rule 4.17(iv), an English translation together with a statement that the translation is accurate is required. The USPTO currently provides translations of forms PTO/AIA/01 and PTO/AIA/02 into 10 languages: Chinese (simplified), Dutch, French, German, Italian, Japanese, Korean, Russian, Swedish, and Spanish.

Sequence Listing (if Applicable)

This section, for the disclosure of a nucleotide or amino acid sequence, should contain a listing of the sequence complying with 37 CFR §1.821 through 37 CFR §1.825 and may be in paper or electronic form.

Obtaining a Receipt for Documents Mailed to the USPTO

Patent correspondence filed in a nonprovisional utility application after the application filing date (known as "follow-on" correspondence) can still be filed by mail or hand-delivery without incurring the $400 non-electronic filing fee. You do not have to be a registered eFiler to file a patent application via EFS-Web; however, **unregistered eFilers are not permitted to file follow-on correspondence via EFS-Web**. Follow-on correspondence filed by anyone other than an EFS-Web registered eFiler must be sent by mail or be hand-delivered. In the event you receive from the USPTO a "Notice of Incomplete Application" in response to your EFS-Web filing stating that an application number has been assigned but no filing date has been granted, you must become a registered eFiler and file your reply to the "Notice of Incomplete Application" via EFS-Web in order to avoid the $400 non-electronic filing fee. To become a

registered eFiler and have the ability to file follow-on correspondence, please consult the information at **www.uspto.gov/patents/process/file/efs/guidance/register.jsp** or call the Electronic Business Center at 866-217-9197.

A receipt for documents mailed or hand-delivered to the USPTO can be obtained by attaching a stamped, self-addressed postcard to the first page of the documents. The postcard should contain a detailed list that identifies each type of document and the number of pages of each document. Upon receipt at the USPTO, the detailed list on the postcard will be compared to the actual contents of the delivery. Any discrepancies between the detailed list and the actual contents will be noted on the postcard. The postcard will be initialed and date stamped by the person who reviewed the application in the Office of Patent Application Processing. The postcard will be returned by mail to the addressee whose name appears on the postcard.

The returned postcard serves as evidence of receipt in the USPTO of all items listed on the postcard, unless otherwise noted by the USPTO on the postcard. That is, if the postcard receipt has been annotated to indicate that a particular paper was not received, the postcard receipt will not serve as evidence of receipt of that paper in the USPTO. Likewise, the postcard receipt will not serve as evidence of receipt of papers that are not adequately itemized.

When preparing the detailed list of documents identified on the postcard, it is important to include the following identifying information:

- application number (if known)
- confirmation number (if known)
- filing date of the application (if known)
- title of the invention
- name(s) of the inventor or inventors

The postcard should also include a detailed list of every document type and the number of pages of each document that are included in the delivery.

Although it is highly recommended that nonprovisional utility applications be filed electronically via EFS-Web in order to avoid the non-electronic filing fee, a nonprovisional utility application may still be filed by mail, incurring the additional $400 fee ($200 for small entity applicants). If

a postcard is submitted with a patent application, the detailed listing should include the following items:

- title and number of pages of each USPTO form
- number of pages of specification (excluding claims)
- number of claims and the number of claim pages
- number of figures of drawing and the number of sheets of drawings
- whether an oath or declaration statement is included and the number of pages
- type and number of other documents that are included and the number of pages of each document
- amount of payment and the method of payment (i.e., check, credit card, money order, or **USPTO deposit account)**

It is important that the postcard itemizes each component of the application. For example, a general statement such as "complete application" or "patent application" or "drawings" will not show that each of the required components of an application was included if one of the items is later found to be missing by the USPTO.

When the self-addressed postcard is submitted with a utility patent application, the USPTO will stamp the postcard being returned to the addressee with both the receipt date and the application number before placing it in the outgoing mail.

Upon receipt of the returned postcard, the addressee should promptly review the postcard to ensure that all documents and all pages were received by the USPTO.

Pursuant to 35 U.S.C. 21 and 37 CFR § 1.10, any correspondence received by the USPTO (including an application filing) that was delivered via "Priority Mail Express Post Office to Addressee" service of the United States Postal Service (USPS) will be considered filed in the Office on the date of deposit with the USPS. The date of deposit with the USPS is shown by the "date-in" or "date accepted" on the mailing label or other official USPS notation. If the USPS deposit date cannot be determined, the correspondence will be accorded the Office receipt date as the filing date. Before depositing an application with the USPS in accordance with the Priority Mail Express procedure set forth at 37 CFR § 1.10, it is important to place the number of the

mailing label on the application papers. Further, only one application should be mailed in a single Priority Mail Express package.

Drawing Requirements

Information on drawing requirements is based substantially on 37 CFR § 1.84.

Black and white drawings are normally required. India ink, or its equivalent that secures black solid lines, must be used for drawings. For nonprovisional utility applications, the "sheets" of drawings should be contained in an electronic document in PDF format filed via EFS-Web together with the other application documents in PDF format. Drawings made by hand should be scanned into PDF format for filing via EFS-Web. The following margins are required:

- On 21.6 cm by 27.9 cm (8 1/2 by 11 inches) drawing sheets, each sheet must include a top margin of at least 2.5 cm (1 inch), a left-side margin of at least 2.5 cm (1 inch), a right-side margin of at least 1.5 cm (5/8 inch), and a bottom margin of at least 1 cm (3/8 inch) from the edges, thereby leaving a sight (the usable surface) no greater than 17.6 cm by 24.4 cm (6 15/16 by 9 5/8 inches).

On 21 cm by 29.7 cm (DIN size A4) drawing sheets, each sheet must include a top margin of at least 2.5 cm (1 inch), a left-side margin of at least 2.5 cm (1 inch), a right-side margin of at least 1.5 cm (5/8 inch), and a bottom margin of at least 1 cm (3/8 inch) from the edges, thereby leaving a sight no greater than 17 cm by 26.2 cm.

Numbering of Sheets of Drawings and Views

The sheets of drawings should be numbered in consecutive Arabic numerals, starting with 1, within the sight. These numbers, if present, must be placed in the middle of the top of the sheet but not in the margin. The numbers can be placed on the right-hand side if the drawing extends too close to the middle of the top edge of the usable surface. The drawing sheet numbering must be clear and larger than the numbers used as reference characters to avoid confusion. The number of each sheet should be shown by two Arabic numerals placed on either side of an oblique line, with the first being the sheet number and the second being the total number of sheets of drawings, with no other marking.

The different views must be numbered in consecutive Arabic numerals, starting with 1, independent of the numbering of the sheets and, if possible, in the order in which they appear on the drawing sheet(s). Partial views intended to form one complete view, on one or several sheets, must be identified by the same number followed by a capital letter. View numbers must be preceded by the abbreviation "FIG." Where only a single view is used in an application to illustrate the claimed invention, it must not be numbered and the abbreviation "FIG." must not appear.

Numbers and letters identifying the views must be simple and clear and must not be used in association with brackets, circles, or quotation marks. The view numbers must be larger than the numbers used for reference characters.

Reference Characters

Reference characters not mentioned in the description shall not appear in the drawings. Reference characters mentioned in the description must appear in the drawings.

Reference characters (numerals are preferred), sheet numbers, and view numbers must be plain and legible and must not be used in association with brackets or inverted commas, or enclosed within outlines (encircled). They must be oriented in the same direction as the view to avoid having to rotate the sheet. Reference characters should be arranged to follow the profile of the object depicted.

Reference characters must have a print size of at least 0.32 cm (1/8 inch) in height. They should not be placed in the drawing in a way that interferes with its comprehension. Therefore, they should not cross or mingle with the lines. They should not be placed upon hatched or shaded surfaces. When necessary to indicate a surface or cross section, a reference character may be underlined and a blank space may be left in the hatching or shading where the character occurs so that it appears distinct.

The same part of an invention appearing in more than one view of the drawing must always be designated by the same reference character, and the same reference character must never be used to designate different parts.

Lead Lines and Arrows

Lead lines are those lines between the reference characters and the details to which they refer. Such lines may be straight or curved and should be as short as possible. They must originate in the immediate proximity of the reference character and extend to the feature indicated. Lead lines must not cross each other. Lead lines are required for each reference character except for those that indicate the surface or cross section on which they are placed. Such a reference character must be underlined to make it clear that a lead line has not been left out by mistake. Lead lines must be executed in the same way as lines in the drawing.

Arrows may be used at the ends of lines as follows, provided that their meaning is clear:

- on a lead line, a freestanding arrow is used to indicate the entire section toward which it points.
- on a lead line, an arrow touching a line is used to indicate the surface shown by the line looking along the direction of the arrow.
- to show the direction of movement

Identification of Drawings

Identifying indicia, if provided, should include the title of the invention, the inventor's name, the application number (if known), and docket number (if any). This information must be placed within the top margin of each sheet of drawings. The name and telephone number of a person to call if the USPTO is unable to match the drawings to the proper application may also be provided in the event the drawings are filed in paper, rather than via EFS-Web.

Graphic Forms in Drawings

Chemical or mathematical formulas, tables, computer program listings, and waveforms may be submitted as drawings and are subject to the same requirements as drawings. Each chemical or mathematical formula must be labeled as a separate figure, using brackets when necessary, to show that information is properly integrated. With regard to electrical signals, each group of waveforms must be presented as a single figure using a common vertical axis and time extending

along the horizontal axis. Each individual waveform discussed in the specification must be identified with a separate letter designation adjacent to the vertical axis. These may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation. Characters used in such formulas and tables must meet the requirements set forth in 37 CFR §1.58(c).

Views

The drawing must contain as many views as necessary to show the invention. The views may be plan, elevation, section, or perspective views. Detailed views of portions of elements, on a larger scale if necessary, may also be used. All views of the drawing must be grouped together and arranged on the sheet(s) without wasting space, preferably in an upright position, clearly separated from one another, and must not be included in the sheets containing the specifications, claims, or abstract. Views must not be connected by projection lines and must not contain center lines. Waveforms of electrical signals may be connected by dashed lines to show the relative timing of the waveforms.

Exploded Views

Exploded views, with the separated parts embraced by a bracket, to show the relationship or order of assembly of various parts are permissible. When an exploded view is shown in a figure that is on the same sheet as another figure, the exploded view should be placed in brackets.

Partial Views

When necessary, a view of a large machine or device in its entirety may be broken into partial views on a single sheet, or extended over several sheets if there is no loss in facility of understanding the view. Partial views drawn on separate sheets must always be capable of being linked edge to edge so that no partial view contains parts of another partial view. A smaller scale view should be included showing the whole formed by the partial views and indicating the positions of the parts shown. When a portion of a view is enlarged for magnification purposes, the view and the enlarged view must each be labeled as separate views.

Where views on two or more sheets effectively form a single complete view, the views on the several sheets must be so arranged that the complete figure can be assembled without concealing any part of any of the views appearing on the various sheets.

A very long view may be divided into several parts placed one above the other on a single sheet. However, the relationship between the different parts must be clear and unambiguous.

Sectional Views

The plane on which a sectional view is taken should be indicated by a broken line on the view from which the section is cut. The ends of the broken line should be designated by Arabic or Roman numerals corresponding to the view number of the sectional view, and should have arrows to indicate the direction of sight. Hatching must be used to indicate section portions of an object, and must be made by regularly spaced oblique parallel lines spaced sufficiently apart to enable the lines to be distinguished without difficulty. Hatching should not impede the clear reading of the reference characters and lead lines. If it is not possible to place reference characters outside the hatched area, the hatching may be broken off wherever reference characters are inserted. Hatching must be at a substantial angle to the surrounding axes or principal lines, preferably 45 degrees.

A cross section must be set out and drawn to show all of the materials as they are shown in the view from which the cross section was taken. The parts in cross section must show proper material(s) by hatching with regularly spaced parallel oblique strokes; the space between strokes being chosen on the basis of the total area to be hatched. The various parts of a cross section of the same item should be hatched in the same manner and should accurately and graphically indicate the nature of the material(s) illustrated in cross section.

The hatching of juxtaposed different elements must be angled in a different way. In the case of large areas, hatching may be confined to an edging drawn around the entire inside of the outline of the area to be hatched. Different types of hatching should have different conventional meanings with regards to the nature of a material seen in cross section.

Alternate Position

A moved position may be shown by a broken line superimposed upon a suitable view if this can be done without crowding; otherwise, a separate view must be used for this purpose.

Modified Forms

Modified forms of construction must be shown in separate views.

Arrangement of Views

One view must not be placed upon another or within the outline of another. All views on the same sheet should stand in the same direction and, if possible, stand so that they can be read with the sheet held in an upright position. If views wider than the width of the sheet are necessary for the clearest illustration of the invention, the sheet may be turned on its side so that the top of the sheet is on the right-hand side, with the appropriate top margin used as the heading space. Words must appear in a horizontal, left-to-right fashion when the page is either upright or turned so that the top becomes the right side, except for graphs utilizing standard scientific convention to denote the axis of abscissas (of X) and the axis of ordinates (of Y).

Front Page View

One of the views should be suitable for inclusion on the front page of the patent application publication and patent as the illustration of the invention.

Scale

The scale to which a drawing is made must be large enough to show the mechanism without crowding when the drawing is reduced in size to two-thirds in reproduction. Indications such as "actual size" or "scale 1/2" are not permitted on the drawings since these lose their meaning with reproduction in a different format.

Character of Lines, Numbers, and Letters

All drawings must be made by a process which will give them satisfactory reproduction characteristics. Every line, number, and letter must be durable, clean, black (except for color drawings), sufficiently dense and dark, and uniformly thick and well-defined. The weight of all lines and letters must be heavy enough to permit adequate reproduction. This requirement applies to all lines however fine, to shading, and to lines representing cut surfaces in sectional views. Lines and strokes of different thicknesses may be used in the same drawing where different thicknesses have a different meaning.

Shading

The use of shading in views is encouraged if it aids in understanding the invention and if it does not reduce legibility. Shading is used to indicate the surface or shape of spherical, cylindrical, and conical elements of an object. Flat parts may also be lightly shaded. Such shading is preferred in the case of parts shown in perspective, but not for cross sections. See discussion of sectional views above. Spaced lines for shading are preferred. These lines must be thin, as few in number as practicable, and they must contrast with the rest of the drawings. As a substitute for shading, heavy lines on the shade side of objects can be used except where they superimpose on each other or obscure reference characters. Light should come from the upper left corner at an angle of 45 degrees. Surface delineations should preferably be shown by proper shading. Solid black shading areas are not permitted, except when used to represent bar graphs or color.

Symbols

Graphical drawing symbols may be used for conventional elements when appropriate. The elements for which such symbols and labeled representations are used must be adequately identified in the specification. Known devices should be illustrated by symbols that have a universally recognized conventional meaning and are generally accepted in the art. Symbols that are not universally recognized may be used, subject to approval by the USPTO, if they are not likely to be confused with existing conventional symbols, and if they are readily identifiable.

Legends

Suitable descriptive legends may be used, or may be required by the examiner, where necessary for understanding of the drawing, subject to approval by the USPTO. They should contain as few words as possible.

Copyright or Mask Work Notice

A copyright or mask work notice may appear in the drawing, but it must be placed within the sight of the drawing immediately below the figure representing the copyright or mask work material and be limited to letters having a print size of 0.32 cm to 0.64 cm (1/8 to 1/4 inches) high. The content of the notice must be limited to only those elements provided for by law. For example, "©1983 John Doe" (17 U.S.C. 401) and "*M* John Doe" (17 U.S.C. 909) would be properly limited and, under current statutes, legally sufficient notices of copyright and mask work, respectively. Inclusion of a copyright or mask work notice will be permitted only if the authorization language set forth in 37 CFR §1.71(e) is included at the beginning (preferably as the first paragraph) of the specification.

Security Markings

Authorized security markings may be placed on the drawings provided they are outside the sight, preferably centered in the top margin.

Black and White Drawings Are Normally Required

On rare occasions, color drawings may be necessary as the only practical medium by which the subject matter sought to be patented in a utility patent application is disclosed. The USPTO will accept color drawings in utility patent applications and statutory invention registrations only after granting a petition explaining why the color drawings are necessary. Any such petition must include:

- the appropriate fee set forth in 37 CFR §1.17(h)

- three sets of color drawings
- the following language as the first paragraph in that portion of the specification relating to the **Brief Description of the Several Views of the Drawing**. If the language is not in the specification, an amendment to insert the language must accompany the petition.

"The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee."

Photographs are not ordinarily permitted in utility patent applications. The USPTO will accept black and white photographs in utility patent applications in applications in which the invention is not capable of being illustrated in an ink drawing or where the invention is shown more clearly in a photograph. For example, photographs or photomicrographs of electrophoresis gels, blots (e.g., immunological, western, southern, and northern), autoradiographs, cell cultures (stained and unstained), histological tissue cross sections (stained and unstained), animals, plants, in vivo imaging, thin layer chromatography plates, crystalline structures, and ornamental effects continue to be acceptable. Only one set of black and white photographs is required. Furthermore, no petition or additional processing fee is required.

Photographs have the same format requirements as drawings. The photographs must be of sufficient quality so that all details in the drawing are reproducible in the printed patent or any patent application publication.

Color photographs will be accepted in utility patent applications if the conditions for accepting color drawings have been satisfied.

Patent and Trademark Resource Center Program

The Patent and Trademark Resource Center (PTRC) Program is a network of PTRC-designated libraries found in 46 states (as of 2014), the District of Columbia, and Puerto Rico. When a library is designated as a PTRC by the USPTO, it receives house copies of U.S. patents and patent and trademark materials and actively disseminates patent and trademark information to the public. The PTRC network provides access to many of the same products and services offered at the USPTO public search facilities in Alexandria, Virginia**.** The scope of PTRC collections,

hours of operation, services, and fees (where applicable) vary depending on PTRC location. Users are advised to call ahead to determine products and services available at a particular PTRC. PTRCs also offer automated access to patent and trademark information. Please refer to the USPTO website for a complete list of PTRCs at **www.uspto.gov/go/ptdl/**.