

# **Pencils, White-Out, and Loose Leaf Paper: Student Researchers' Need for Basic Intellectual Property Instruction**

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Unlike almost all other countries, the United States is a first-to-invent country — the right to a patent does not necessarily belong to the first person to file an application with the U.S. Patent and Trademark Office (“USPTO”). Instead, the right to a patent typically belongs to the person who can effectively prove that he or she was the first inventor.

Evidence used to prove dates of invention may take many forms, including oral testimony, photographs, sketches, models, notebook entries, etc. (*see* 37 C.F.R. § 1.131). For many university technology transfer offices, laboratory notebook entries might provide essential evidence in patent proceedings. Despite the importance of these notebooks, however, students engaged in research are seldom instructed, whether by the university or their principle investigator, in proper notebook entry methods or basic intellectual property law. This article discusses the evidentiary standard required to establish dates of invention and provides essential information to educate student researchers on how to maintain laboratory notebooks that meet the necessary standard.

## **I. Who is “The First Inventor”?**

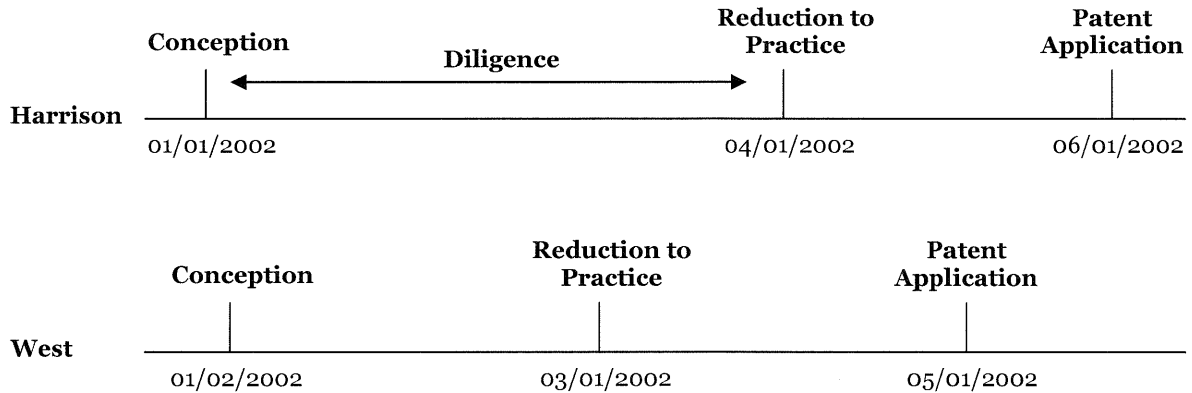
When two or more parties file patent applications that claim the same invention or part of an invention, the USPTO must first determine which party was the first to conceive of and create the invention. This is called an “interference proceeding,” also known as a “priority contest.” Interference proceedings are conducted by Administrative Patent Judges of the USPTO’s Board of Patent Appeals and Interferences (“BPAI”). After hearing the case, these Administrative Patent Judges declare one party to be the first inventor. The decision may then be appealed to the United States Court of Appeals for the Federal Circuit.

A priority determination involves two different concepts – the mental conception of an invention and that invention’s reduction to practice. Conception is defined as “the formation in the mind of the inventor of a definite and permanent idea of the complete and operative invention as it is thereafter to be applied in practice,” Townsend v. Smith, 36 F.2d 292, 295 (C.C.P.A. 1930), and “reduction to practice” is the embodiment of that conception. An embodiment can be achieved either through actual reduction to practice – *i.e.*, building the invention – or through constructive reduction to practice, which is the filing of a patent application on the claimed invention.

The date of conception and the date of reduction to practice are critical in an interference proceeding. The proceeding is typically decided in favor of the inventor who was the first to reduce the invention to practice (either actually or constructively). However, the *second* inventor to reduce it to practice may still prevail in the interference proceedings if that inventor was the first to conceive of the invention and was diligent in attempting to reduce it to practice. This second-to-reduce-to-practice inventor must prove that he or she has been diligent from a time before the other inventor’s conception

of the invention all the way through to his or her own eventual reduction to practice. Additionally, neither inventor can abandon, suppress, or conceal his or her invention.

To illustrate these rules, let's consider a hypothetical situation. Dr. Harrison conceived of a process for producing widgets on January 1, 2002 and worked in his R&D department to develop the process. On January 2, 2002, a competitor, Dr. West, conceived of the same process and began to develop it in his own laboratory. Dr. West reduced the invention to practice on March 1, 2002, whereas Dr. Harrison reduced to practice on April 1, 2002. Dr. West filed a United States patent application on May 1, 2002, and Dr. Harrison filed one on June 1, 2002.



January 1, 2002	Dr. Harrison conceives of invention
January 2, 2002	Dr. West conceives of invention
March 1, 2002	Dr. West reduces the invention to practice
April 1, 2002	Dr. Harrison reduces the invention to practice
May 1, 2002	Dr. West files a U.S. patent application
June 1, 2002	Dr. Harrison files a U.S. patent application

If the United States were a first-to-file country, Dr. West would have priority; however, since the United States is a first-to-invent country, the BPAI must determine who was the first to invent the widgets. Since Dr. West was the first to reduce the invention to practice, he would normally be favored in the interference proceedings. Under this hypothetical, however, Dr. Harrison was the first to conceive and worked diligently to reduce the invention to practice. As a result, Dr. Harrison would likely prevail if he had sufficient evidence proving the date of his conception of the invention. However, if Dr. Harrison had decided to work on another project for the month of February, it is possible that the court would find that he had not been diligent and thus did not have priority. *See generally*, 35 U.S.C. § 102(g) and 37 C.F.R. § 1.131.

In addition to clarifying the rules associated with the first-to-invent concept, this hypothetical situation also illustrates the need for evidence to establish the dates of conception and reduction to practice. Indeed, those dates that the inventor can *prove* for conception and then reduction to practice may be considered even more critical to interference proceedings than the actual dates. If Dr. Harrison failed to keep a well-

organized and timely notebook, he would have difficulty proving that he conceived of the invention the day before Dr. West.

## **II. What Evidence is Required to Establish “The First Inventor”?**

### **A. Proof of Conception and Reduction to Practice**

If a patent application is challenged in an interference proceeding, the applicants must prove their conception and reduction to practice dates by a preponderance of the evidence. Stated another way, the applicants bear the burden of establishing that it is more likely than not that the alleged dates are the actual dates of conception and reduction to practice. Since the date of *constructive* reduction to practice is determined by the filing date of the patent application, we will only examine the need to prove the *actual* reduction to practice date. If an applicant is unable to prove his or her actual conception date, the conception date is considered to be the reduction to practice date, whether actual or constructive.

The most common forms of evidence used to establish the dates of conception and reduction to practice are documents and witness testimony. Testimony is usually in the form of a declaration or an affidavit. Documentary evidence can take many forms, including laboratory notebooks, letters, calendars, and electronic records. Any documentary evidence submitted to the BPAI must be accompanied by a discussion (from the inventor, other individuals with knowledge of the document, or an expert) of the significance of that evidence.

### **B. Proof of Diligence**

As shown by the hypothetical above, some inventors will be required to prove diligence in addition to proving dates of conception and reduction to practice. Diligence can be described as the inventor’s faithful efforts to reduce an invention to practice. To prove an inventor’s diligence by a preponderance of the evidence, the party must show that there was no unreasonable lapse of work on the invention during the critical period. The critical period begins immediately after that inventor’s date of conception and before the other inventor’s conception, *or* before the other inventor begins an unabandoned effort to reduce the invention to practice. The critical period ends with the inventor’s reduction to practice (either actual or constructive).

There is no strict guideline for determining whether a lapse is reasonable or unreasonable. A few days away from a project (*i.e.*, weekends, holidays, or briefly working on another project) is usually not sufficient to support a finding of abandonment. A few weeks or a month without effort being expended on reducing the invention to practice, however, might be strong evidence of abandonment. Thus, it is important that laboratory notebooks contain clear evidence of day-to-day work on a project, as well as clear and honest explanations for any period during which no effort was expended. If inventors are unable to prove diligence, they can lose their earlier date of conception.

The diligence standard ends once an invention has been reduced to practice. Instead, an inventor involved in interference proceedings might be required to prove that he or she did not abandon, suppress, or conceal the invention in the time between reduction to practice and the filing of a patent application.

### **C. The Corroboration Requirement**

Even if an inventor is able to provide witness testimony to prove a date of conception, or if the inventor is able to submit documentary evidence of the date of reduction to practice, that evidence might not be enough to prevail in interference proceedings. The inventor must also overcome the strict corroboration requirement, which requires an applicant to produce corroborating evidence from a non-inventor party or thing (such as a document). A joint inventor, for instance, would not be considered independent and could therefore not provide sufficient corroborating evidence. The corroboration requirement does not apply to an applicant who is using the filing date of his or her application as the constructive conception and/or reduction to practice date(s).

The corroboration requirement sets a very high standard for proving diligence and the dates of conception and reduction to practice. Since the inventor is unable to rely on laboratory notebooks, co-inventors, oral testimony, or other documentary evidence alone to prove critical dates, he or she must be able to find some independent source of corroborating evidence. This could include oral or written testimony from any independent source who was knowledgeable of the inventor's activity during the critical period. The best source of evidence might be verification of laboratory work from a knowledgeable but independent third-party who monitors notebooks and laboratory activity on a regular basis.

### **III. Other Reasons to Maintain an Adequate Laboratory Notebook**

While only some inventors will be involved in interference proceedings, all inventors must satisfy the many statutory conditions for patentability, including novelty and nonobviousness. Section 102(a) of the United States Patent Act ("Patent Act") currently states that "[a] person shall be entitled to a patent unless . . . the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent." For instance, if an article in *Science* describes an invention on May 1, 2002, an inventor must be able to prove that he or she invented *before* May 1, 2002. A well-maintained laboratory notebook could be used to clearly establish that the applicant invented prior to May 1, 2002.

Section 102(e) of the Patent Act provides that an applicant is not entitled to his or her patent if "the invention was described in (1) an application for patent by another . . . before the invention by the applicant . . . or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent." In other words, if another person has filed an application or has already been granted a patent that describes the invention, then the inventor must be able to prove that he or she invented *before* the other person's application date.

Consider the following hypothetical. Mr. Smith invented the seamless widget on August 1, 2000 and files a patent application on December 1, 2000 that is published 18 months later. Mr. Smith's application contains a disclosure that describes Mr. Kline's invention, a circular widget, which he invented on September 1, 2000. Upon publication, Mr. Smith's application becomes prior art with the filing date as the effective date. Discounting any issues of novelty or obviousness, Mr. Kline must be able to prove that he invented circular widgets *before* December 1, 2000. If Mr. Kline keeps a well-maintained notebook, he will likely be able to provide the necessary evidence.

Laboratory notebooks can provide useful evidence of an entire inventive process, from conception to reduction to practice. A notebook can also provide evidence that an inventor was actually the inventor of a thing. Section 102(f) of the Patent Act states that "[a] person shall be entitled to a patent unless . . . he did not himself invent the subject matter sought to be patented." If an inventor is accused under section 102(f) of not being the actual inventor, his or her notebook will potentially capture the entire inventive process and thus provide strong evidence to refute the accusations.

#### **IV. What is a "Well-Maintained" Laboratory Notebook?**

A well-maintained laboratory notebook should be able to prove the essential facts of the inventive process, including conception, reduction to practice, and, if necessary, diligence. To accomplish this, a laboratory notebook must contain four essential components: (1) a detailed description of the work that was performed; (2) the date(s) that the work was performed; (3) the signature of the scientist(s) or inventor(s) who participated in the work, and; (4) the dated signature of a witness who read and understood the work performed. The following suggestions may provide strong supporting evidence for interference proceedings or other forms of patent litigation.

##### **Notebook:**

1. The notebook should be permanently bound; do not use loose leaf paper.
2. The notebook should be composed of high-quality acid-free paper.
3. ALWAYS use ink to write in a notebook; do not use pencil or any other erasable writing instrument.
4. The ink should be permanent.
5. Every page in the notebook should be sequentially numbered.
6. Do not remove pages or other material from the notebook.
7. Date and draw a line through any unused page in the notebook.
8. Material affixed to a page should be permanently affixed and then signed and dated such that the signature runs onto both the new material and the notebook page.

9. Any material added to a notebook should be mentioned in a notebook entry as well as dated and signed by a witness.
10. Each student should have his or her own notebook.
11. Notebooks, both current and completed, should be permanently stored in a safe and protected location.
12. Notebooks should never leave the laboratory or the facility.

### **Entries:**

1. Notebook entries should be written legibly.
2. Entries should describe the purpose of each experiment, the hypothesis, as well as all materials and experimental procedures; there should be enough information to enable someone skilled in the art to replicate the experiment.
3. Entries into a notebook should describe the results, both favorable and unfavorable, of each experiment.
4. Any work contributed by another person should be credited to those individuals in the relevant entries. This co-worker should sign and date the entry.
5. Ideas should also be recorded in the notebook.
6. Avoid using abbreviations or jargon, since the notebook should be understandable to patent attorneys, judges, and juries.
7. Any long delay or gap in experimentation or research on a particular project should be explained in the notebook.

### **Corrections:**

1. Do not erase, delete, or otherwise make illegible any information in a notebook – draw a single line through the material.
2. The correction or deletion should be explained in the notebook.
3. Sign (or initial) and date corrections and deletions.

Despite the importance of well-maintained laboratory notebooks, few universities or technology transfer offices provide any form of basic intellectual property education to incoming students. A brief educational session can provide student researchers the information they need to create and maintain adequate laboratory notebooks, thereby decreasing the possibility of patent problems or litigation in the future, and instill

essential skills that will be employed after these students leave the laboratory and enter academic or industry fields.

**Sources:**

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