1. **What is a Patent?**

A patent is an agreement between an inventor and the government, granting the inventor the right, for a limited period, to exclude others from making, using, or selling the described invention. As stated in the United States Constitution, the main purpose of patents is “to promote the progress of science and the useful arts...” While an inventor may financially benefit from a patented invention, the public also benefits from it by buying and using it. The full patent disclosure in turn allows the public to take unrestricted advantage of the invention when the patent expires (20 years from the filing date). While providing an inventor with a monopoly on the practice of the invention for a limited period of time, the patent system encourages further development of the technology, as well as inventions in the same field by others.

2. **What can be Patented?**

The U.S. patent law postulates that patents may be granted on:

1. A **process**, such as a method of applying a vapor barrier to silicon materials;
2. A **machine**, such as a new instrument to detect volatile gases;
3. An **article of manufacture**, which is any product or thing made by human effort, such as a table or a key ring, or a genetically engineered protein;
4. A **composition of matter**, such as a new chemical compound, or a new microorganism;
5. **New and useful improvements** of the above, even if the prior process, machine or composition of matter on which the improvement is based has been patented;
6. Any **distinct and new variety of plant** which is asexually reproduced;
7. Any **new, original, and ornamental design** for an article of manufacture.

Things that are not patentable include theories, non-demonstrable ideas, plans of action, methods of business, discoveries of laws of nature, and anything repugnant to morals or leading to injury.
3. Major Requirements for a Patentable Invention

Under United States Patent Law, all patent applications are examined for novelty, usefulness, and non-obviousness.

**Novelty:** the invention must be demonstrably different from any existing prior art; this means that it cannot be described in prior “public disclosure”, such as publication or previous patent, or available to the public, either as a commercial product or by being within the public domain.

**Usefulness:** the invention must be useful in ways which represent improvements over existing products and/or techniques.

**Non-obviousness:** the invention cannot be obvious to a person of "ordinary skill" in the art; non-obviousness is usually demonstrated by showing that the use of the invention yields surprising, unexpected results.

Each of these three criteria is open to interpretation. Establishing novelty and/or usefulness often relies on arbitrary value judgments. For example, it may not be clear that a new gene-sequencing instrument is “demonstrably different” from other existing models, or that the use of a new hybridoma for narrow research purposes is sufficiently significant to be called a “useful” improvement over existing techniques.

Despite the possible variety of definitions of novelty and usefulness, the concept of “non-obviousness” is the most complex of these three patentability requirements. Mere simplicity of an invention does not necessarily imply that it is an obvious invention. Judging what is obvious to one of “ordinary skill” in an art is rarely straightforward, especially in technologically complex and rapidly changing fields. "Obviousness" is most frequently cited by patent examiners as the reason for deeming an invention not patentable.

Finally, patent law states that inventions may be patented if they have been reduced to practice, either actually or constructively.

Actual reduction to practice means actual making of the patented object, carrying out the method, etc., and demonstrating the operability of the patented concept. Constructive reduction to practice is merely teaching the public how to practice an invention, therefore limited extrapolation of the inventive concept can be included in a patent application.