

UNITY OF INVENTION

A key factor in patent cost management



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One patent for one or more inventions?

The requirement for 'Unity of Invention', whereby 'a patent application may relate to one invention only, or to a group of inventions so linked as to form a single general inventive concept' is enshrined in both the European Patent Convention, EPC (Article 82), regarding applications in contracting European states and the Patent Cooperation Treaty, PCT (Rule 13), regarding international applications. The US patent office employs *restriction practice* (35USC §121) to limit the examination of a patent application to no more than one independent and distinct invention. The purpose of this article is to introduce the concept of *unity of invention* and to acquaint the reader with various ways of anticipating and successfully avoiding its financially painful consequences.

Budgeting patent costs – sources of error

Among the first tasks of a high-tech start-up company is the protection of the intellectual property on which their business is based, and the preparation of a business plan. These two processes are closely linked, since gaining exclusive patent rights to a platform technology may become one of a company's greatest assets, and of key importance when raising capital. Achieving this goal, however, requires time and dedication on the part of the inventors, as well as capital. Patent prosecution is likely to be a major component in the company's business and economic planning, since patent rights, effective in the major economic nations of the world, are both expensive to obtain, and to maintain. The budget for protecting an invention will include the estimated costs of writing and filing one or more priority applications; filing an international application based on the priority application(s) within 12 months; and subsequently entering the regional or national patent prosecution phase, at 30/31 months, in those countries of the world in which protection is sought. The actual costs of seeking patent protection will depend on whether the respective patent offices grant a patent for the claimed invention as originally filed, or whether, more likely, lengthy correspondence and amendments are required before all or part of the claimed invention is granted. An additional factor, that can lead patent costs to escalate far beyond the initial budget, is when the patent office finds an application to lack *unity of invention*.

Unity of invention – a reasonable requirement but with costly consequences

When a patent application is filed as an International or European application, a *search report* is drawn up, which identifies those documents to be taken into account in assessing the patentability of the invention, in terms of its novelty and inventive step. If the examiner (*a priori*) can immediately see that claimed inventions in the application lack *unity of invention*, without considering any previous public knowledge (the prior art), only the first claimed invention will be searched, and the applicant is invited to pay a fee of circa €1550 for the search of each additional invention claimed. This procedure serves to protect the patent office from unreasonable search and examination duties. If the finding of lack of unity is not reversed, the applicant will be required to file parallel divisional applications for each invention, and the subsequent patent costs

will multiply proportionally. A finding of lack of unity can also occur during examination of the application (*a posteriori*), when the claimed inventions are compared to the prior art, and one or more are found to lack novelty. The applicant will again be forced to file a divisional application to protect each separate invention.

Unity of invention explained with a working example

An invention can be defined as the *technical teaching* in a patent application that solves a *technical problem* in a manner that is both novel and inventive over known solutions. For example, a patent application might provide *technical teaching* on various mutant yeast strains, for the faster and more efficient production of bio-ethanol. The *special technical feature* of this invention is a group of mutant yeast strains, whose effect is novel with respect to existing strains for bio-ethanol production. In deciding whether the patent application lacks *unity of invention*, the patent examiner must first determine whether the claimed mutant yeast strains solve more than one technical problem. If the answer is *no*, the examiner must further assess whether the claimed invention(s) provides alternative solutions to the *technical problem*. In the present working example, the invention provides yeast strains with different mutations, each yeast strain having the same novel *technical effect* of faster and more efficient bio-ethanol production. Since these mutant yeast strains have the same *technical effect*, they provide alternative technical solutions to the problem, and together form a *single general inventive concept*. It is important to stress that yeast strains carrying widely different mutations will be considered as the same invention, provided they provide the same novel *technical effect*. On the basis of the above example, the application will have *unity of invention*. However, if the technical effect were already known for a single yeast strain, then the application would lack a *single general inventive concept* and the examiner would find a *lack of unity*.

In the present working example, the application might further claim a method for the faster and more efficient production of bio-ethanol using the mutant yeast strain of the invention, where the product is ethanol. Since mutant yeast strains are the *special technical feature* common to both the claim to the method, and the claim to mutant yeast strains, the two inventions are said to be *linked*, and the application has *unity of invention*.

The inventors in the present working example may also have claims to a novel fermentation apparatus for the faster and more efficient production of bio-ethanol, according to the claimed method described above. If the application convincingly demonstrates that the apparatus is specifically adapted to carry out the method of bio-ethanol production claimed in the application, then the examiner will also find unity of invention. This requirement does not exclude the possibility that the apparatus might be used for the production of alternative products or that the method for bio-ethanol production might have been performed with a different apparatus.

Linking claims provide one of the best approaches for achieving *unity of invention* in an application, but they must be correctly worded. In the present working example, it is essential that the claims to the method, or to the apparatus, for the production of bio-ethanol each include the *special technical feature* of the novel mutant yeast strains. Only then will the separate claims be *linked* and the application has *unity of invention*.

A patent application may provide solutions to more than one technical problem, in which case the patent examiner needs to determine whether the technical problems constitute a linked series of problems or whether they are component parts of a larger over-arching problem.

In respect to the present working example, the application might further provide a method for selecting a novel mutant yeast strain according to the invention. This method would provide a solution to a problem of providing a mutant yeast strain that would, in turn, help to solve the

following problem of providing a method for the faster and more efficient production of bio-ethanol using these yeast strains. However, it is less likely that an invention of gasoline mixtures, comprising bio-ethanol, could be linked to the preceding group of inventions, unless it was part of the over-arching problem addressed by the application.

Special challenges for biotechnology inventions

The post-genomic era in the biosciences has generated a wealth of data that is being exploited by a host of new biotechnology companies. The current challenge for these companies, and their patent attorneys, is to capture this know-how in a minimum number of patent applications, while ensuring that the patents are broad enough to prevent competitors from working around and thereby avoiding their patented technology. The following example illustrates the kind of problem that may be faced. A patent application is filed to a newly isolated family of proteins with a use in pharmaceuticals. The inventor has identified 2 or more members of the family, and wishes to seek patent protection for them all. Even though the protein family and its function(s) are patentable, the examiner may declare a lack of *unity of invention* and be unwilling to search all the different members of the protein family claimed. However, if the applicant applies the concept of *special technical feature(s)* with a *special technical effect(s)*, it may be possible to define a group of linked inventions, which have *unity of invention*. One effective strategy is to identify structural domains conserved among all the members of the protein family that have a common technical effect, e.g., structural domains having catalytic or specific binding effects. In this instance, the claims could include all the members of a protein family comprising a number of specific technical features, each having a defined biological effect. Claims of this type are more likely to be accepted as a group of inventions, linked by their common features/effects, by the patent authorities.

US patent practice regarding one invention – one patent

The parallel procedure of *restriction practice* that is rigorously applied by the US patent and trademark office (USPTO) also aims to limit the workload of its examiners. The operation of *restriction practice* is complex, and lies outside the scope of this article. However, high-tech companies may be reassured to learn that the rules governing *unity of invention* under the PCT apply to international patent applications during both the international and national phases, including international applications entering the national phase in the US.

Paying for additional searches under protest - a word of warning

An applicant may pay the extra fees needed for the search of some, or all, of the inventions in an international application under *protest*, stating that the application complies with the requirements for *unity of invention*, or that the amount of the required additional fee is excessive. The protest is examined by the patent office, and if justified, the applicant will have part, or all, of the additional fee refunded. However, the applicant's arguments will become part of the application's permanent file, and may be used against him/her in future prosecution, or litigation, of the claimed invention. The applicant may argue, for example, that the claimed invention provides a number of novel alternative solutions to a common technical problem. If the examiner later finds one of the claimed solutions to be known and lack novelty, the applicant will have the difficult task of arguing that the remaining alternative solutions were not obvious solutions, with respect to each other.

Pro-active patent strategy – good business practice

Effective, economical and useful patent protection depends on an active and informed collaboration between the patent attorney and the inventors and management of a technology-based company. While the applicants may find the patenting process a daunting 'passage of rights', the economic gains of a clear-cut and pro-active patent strategy are not to be underestimated.