Patenting research outputs – finding a gap in a crowded market

As we continue our series on considerations for researchers interested in patenting their research outputs, we turn to some of the finer details of patentability in the field of chemistry. This time, we look at "selection inventions".

Selection inventions

To be patentable, an invention must be novel, inventive and capable of industrial application. In modern industry, research and development has progressed myriad fields of technology at extraordinary rates, building upon existing developments accrued over the years. As such, the inventive steps that inventions take over the prior art are often iterative, not revolutionary. However, inventions do not necessarily need to step into completely untapped technical fields to be patentable. Rather, patentable inventions can also comprise specific types or subsets within more general groups known in the art, provided they have a technical effect. In UK and European law, these are known as *"selection inventions"*, and they are of particular importance in the field of chemistry.

Species vs Genus

The patentability of selection inventions is based upon the tenet that prior disclosure of a species takes away the novelty of a genus encompassing that species, but not *vice versa*. For example, a patent claim directed to a generally disclosed metal alloy would not be novel if a copper alloy had already been disclosed. However, it would be unfair to deny patent protection to an inventor who discovers a new technical effect of a copper alloy when the prior art only discloses a generic metal alloy with no mention of copper.

Whilst an invention that selects a species when only the genus has been previously disclosed might be novel, it is, of course, not novel to simply select one of a number of options from an existing list. However, if two or more entities are selected from two or more existing lists, their selection could potentially be novel (e.g., where a compound is claimed with two particular substituents, each of which has previously only been disclosed as one of many options to be added to the compound's backbone). In this case, patentability depends, amongst other factors, on the lengths of the two lists of potential substituents.

Numerical ranges

Selecting a numerical sub-range from within a known broader range might also be novel, provided the sub-range is narrow relative to the known range, and sufficiently far removed from the end-points of, or specific examples within, the known range. Of course, it must also have a technical effect to be considered inventive, rather than be an arbitrary selection. Generally, minor technical effects need to be offset by large distances between the endpoints of the sub-range and the known range. A claimed numerical range that overlaps a known range might also be patentable if the known range does not disclose a single specific value that also lies within (or sometimes close to) the range of overlap. As you might imagine, assessment of the likely allowability of numerical selection inventions often requires context-specific analysis from a patent attorney.

Purity and preparation

The purity of a compound is often of importance in the chemicals industry but, whilst it might be seen as a type of selection invention, it can be difficult to patent in Europe. Although a chemical might be of a higher purity than has been previously disclosed, and might thus be novel, the compound per se is only likely to be considered inventive if non-standard methods of purification were used to achieve it. This is based on the understanding that no compound will be 100% pure and so the skilled person would routinely seek to purify it. Whilst somewhat limiting, this is actually a loosening of restrictions, since a claim to a compound was previously held to include that compound at any purity, destroying the novelty of a subsequent claim to that compound at any purity.

As you can see, patent applications for selection inventions (as with all inventions) rely on the identification of a clear technical effect, or inventive step, provided by one's invention. This is best identified early on to enable necessary experimentation to be carried out, and once again demonstrates the paramount importance of preparing and planning one's patent application carefully from the outset.

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