



Patenting alloys

A special case at the European Patent Office

The European Patent Office (EPO) has a particular approach for dealing with claims to alloys. Care needs to be taken when drafting patent applications directed to alloys to make sure that the application can meet the requirements of the EPO while still providing a reasonable scope of protection.

An alloy is a mixture of one or more elements, at least one of which is a metal. A common example of an alloy is steel, which is an alloy of at least iron and carbon. Alloys such as steel are characterised by complex phase diagrams which describe the crystal structure of the alloy as a function of the amount of alloying elements and the processing conditions used in its formation.

The current examination of alloy claims at the EPO is based on its view that a relatively small change in an alloy's chemical composition can lead to a relatively large change in the alloy's physical properties. Therefore, the EPO considers only a fairly narrow scope of claim to be justified. This can result in the examination of alloy claims being significantly stricter than that of other classes of chemical compositions.

If a claim to an alloy defines an "open" composition then it is likely that this will receive an objection at the EPO. For example, a claim to "an alloy comprising metals a, b, c in respective proportions x, y, z" will typically receive an objection, since the term "comprising" is interpreted as allowing the presence of further unidentified elements in the alloy. Similarly, a claim to "an alloy of formula $Fe_aCo_bM_c$ ", where M is an unspecified element, will typically receive an objection.

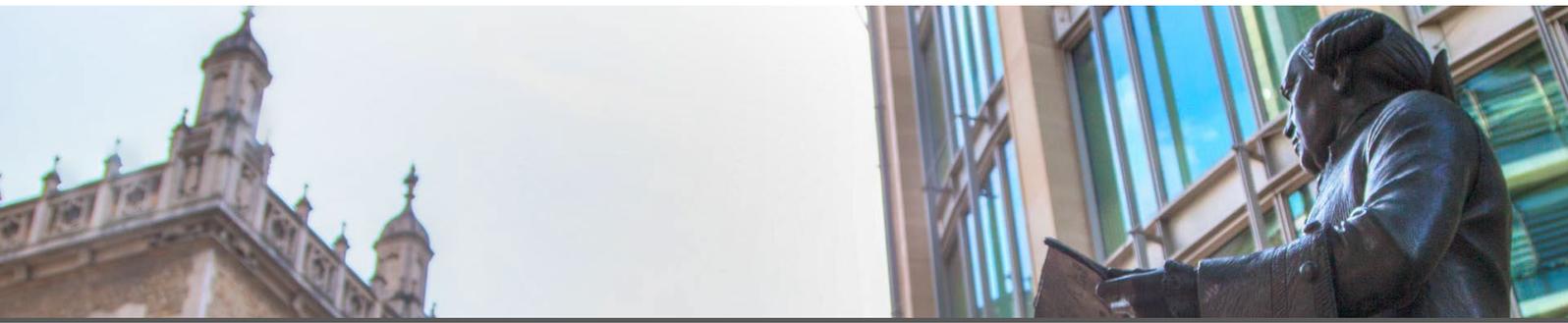
The examiner's rationale is that the use of open language means that other unidentified elements may be present in the alloy that significantly change the properties of the alloy.

Thus, the scope of the claim may encompass alloys which do not achieve the aims of the invention, meaning that the alloy has not been clearly and completely defined.

In order to address this issue, the open language in an alloy claim can be replaced with "closed" language in order to clearly define the alloy. However, any amendment to the claims after filing the application must comply with the EPO's strict rules on added matter, which forbid any new information from being introduced into the application. There is thus a potential conflict between meeting the examiner's requirement for closed language and complying with the added matter rules.

Such a conflict can be avoided if the patent application is drafted to include closed statements defining the scope of the alloy which can then be used as fallback positions. For example, if the original claim is of the form "an alloy comprising metals a, b, c in respective proportions x, y, z" then the description or a dependent claim should define a preferred embodiment as an alloy consisting of the metals, since the term "consisting" is interpreted as not allowing the presence of any further elements.

A convenient way to draft a claim to an alloy to mitigate these issues is to define an element as the "balance" of the alloy, for example "an alloy comprising metals a and b in respective proportions x and y, and the balance of the alloy being metal c". Metal c as the "balance" means that whatever the proportions of a and b, the remaining proportion of the alloy is made up of metal c. EPO case law indicates that "comprising" can be replaced with "consisting of" without contravening the added matter rules for this special case of a claim with a "balance" element. In this way, a claim can be drafted using open language which may be useful in other jurisdictions, but which can be converted to closed language at the EPO.



If the original claim is in the form *“an alloy of formula $Fe_aCo_bM_c$ ”* (where M is not specified) then a list of specific elements from which M can be selected should be provided as a fallback position (i.e. providing a closed list for element M). Care should be taken that this list includes all the elements that can be used as M to prevent a competitor having an easy work-around if this fallback position has to be used.

Optional elements can be accounted for in a closed claim by using language of the following form: *“an alloy consisting of metals a, b, c in respective proportions x, y, z, and, if present, not more than proportion w of each of metals d, e, or f”*.

Such optional elements can take the form of impurities. If impurities in specific amounts are recited in the description (e.g. *“the alloy preferably contains no more than 15 ppm lithium as an impurity”*) then an EPO examiner could insist that these impurity levels are included in the closed claim. Accordingly, care should be taken when drafting to ensure that the levels of any impurities recited in the description are acceptable to the applicant to avoid any unwanted limitation of the claims at the EPO.

In summary, EPO examiners take a strict approach to the assessment of alloy claims, often insisting that a claim to an alloy is worded using closed language. This can lead to problems associated with the strict EPO added matter rules and can lead to a narrow claim which could be easily avoided by a competitor. Such problems can be averted by careful drafting of the patent application.

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