

Perfect composition

When a chemical composition of multiple components has similar or even overlapping components with the prior art, how does the practitioner protect such inventions?

In a crowded patent field, it is difficult to patent compositions because prior art often describes the same components or overlapping ranges of components. Discovered benefits are commonly dismissed by patent examiners as inherent or obvious. To overcome these patenting difficulties, US practitioners should consider the following practice tips.

To help illustrate, let's assume an invention includes up to 20% polymethacrylate (PMA) and up to 15% polyester and forms a stable dispersion free of emulsifiers. After a prior art search, you discover a hypothetical patent document, the Adams reference describing 1 to 30% of PMA and 1 to 27% of polyester. Example one of Adams describes a dispersion of 15% PMA and 11% polyester that forms a stable dispersion and is silent about emulsification.

At first glance, you might think such invention is anticipated or obvious because the inventive ranges of PMA and polyester overlap the described ranges and of PMA and polyester of the Adams patent and the specific PMA and polyester amounts within example one in the Adams patent."¹

Define compositions by a key relationship

To help improve patentability, practitioners should consider defining compositions not just by components and ranges, but also by a relationship between such components. In our hypothetical, for instance, the invention could be defined by a ratio of PMA to polyester, such as a ratio of 0.1 to 0.6, which might aid in stability.

Even if Adams does not describe the ratio, a US patent examiner might still reject the ratio as inherent or an obvious optimisation because Adams discloses both PMA and polyester components. Under these circumstances, a patent examiner might rely on an *ad hoc* calculation, by randomly picking amounts from Adam's broad ranges or example one, to suggest a ratio is taught. But does the broad disclosure of PMA and polyester or example one of Adams render our newly defined invention unpatentable? It depends.

Challenge examiners on obviousness

First, is the ratio inherent? When relying on a theory of inherency, the US patent examiner must provide a factual basis or scientific reasoning to support any conclusion that an allegedly inherent characteristic, even if not recognised by the art, necessarily flows from the teachings of the

art.² In our hypothetical, even if Adams is silent on a ratio, based on the PMA and polyester ranges in Adams and its example one composition, a patent examiner might conclude the claimed ratio is suggested by Adam.

However, while many patent examiners quickly jump to a conclusion of inherency, there are limitations. Possibilities or random results are not inherent.³ In Adams, for instance, the ratio calculated from example one is 1.4. And the broad general ranges of PMA and polyester suggest an almost infinite number of ratios. Thus, without more facts in Adams, this reference does not necessarily teach a ratio of 0.1 to 0.6 because any ratio 'calculated' by a patent examiner, based on Adam's example one, is outside our claimed range. And any other calculated ratio would merely be a random possibility.

Secondly, is the ratio an obvious optimisation? At the US Patent and Trademark Office (USPTO), when the general conditions of a claim are in the prior art, it is not inventive to discover optimum conditions by routine experimentation.⁴ However, while many patent examiners cite the general proposition that it is obvious to optimise a result-effective variable, the burden is still on the patent examiner to justify that the variable being optimised, in our case a ratio, was indeed a result-effective variable to those of ordinary skill in the art.

In our hypothetical, however, for a ratio of PMA to polyester in Adams to be a result-effective variable, there must be factual evidence to support a conclusion that this ratio was known to effect some results.⁵ In the context of a ratio, patent examiners may not be able to find such evidence in the art.

Two old cases provide guidance. The first, *In re Antonie*,⁶ held that the prior art must recognise that the ratio itself was known to affect a particular result. During prosecution, the patent examiner cited a reference that described components of a claimed ratio but did not teach the ratio itself. On appeal, the Court of Customs and Patent Appeals (CCPA) reversed the USPTO stating, "[t]he USPTO... appear[s] to argue that it would always be obvious for one of ordinary skill in the art to try varying every parameter of a system in order to optimise the effectiveness of the system even if there is no evidence in the record that the prior art recognised that particular parameter affected the result."⁷

Notably, Antonie stated, "Whether one would inevitably arrive at the [claimed] ratio... depends on facts which must be read into [the prior art]... and on assumption about the kind of motivation... All of this

involves, at least on this record, mere speculation.”⁸

The second case is *In re Waymouth and Koury*.⁹ On appeal, the CCPA overturned the Patent Office Board of Appeals. Waymouth held a ratio nonobvious, stating, “We cannot agree with the board that appellants’ claimed ratio was the result of obvious experimentation since, in our judgement, any such experimentation would not have come from within the teachings of the art.”¹⁰ Importantly, the CCPA concluded that “the board[,] in discussing the results[,]... appears to have completely ignored the fact that it is appellants, not [the prior art], who have discovered that any relationship exists at all between [the factors in the claimed ratio].”¹¹

Thus, examiners must prove the claimed ratio, and not just components in the ratio, were known in the art to effect a result when justifying obvious optimisation. There are many times when examiners do not have evidence to substantiate such conclusions.

“To help improve patentability, practitioners should consider defining compositions not just by components and ranges, but also by a relationship between such components.”

Develop criticality for the relationship

Is claiming a ratio a magic bullet to patentability? Of course not – a composition does not become nonobvious simply because an applicant describes known relationships between components and results.¹²

When an invention is defined in terms of a ratio, practitioners should develop evidence that such a ratio is unique, special, or critical to aid in patentability. One way to achieve this is to demonstrate that the claimed ratio provides unexpected results.

An unexpected result is a result different than predicted by one of ordinary skill in the art.¹³ “The basic principle behind this rule is straightforward – that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious.”¹⁴ Thus, to help refute obviousness rejections, practitioners should consider working with inventors when drafting an application to establish a story that the claimed ratio provides benefits or advantages that were not anticipated.

Have supporting data

Establishing that a ratio provides unexpected results requires more than a statement or attorney argument. In particular, a ratio may be patentable if an applicant can show that the relationship “produces a new and unexpected result which is different in kind and not merely in degree from the prior art.”¹⁵

To support unexpected results of the ratio, practitioners should work with inventors during the drafting phase to build data sets of comparative and inventive examples. The data could show, for instance, that not all ratios of PMA to polyester within given component ranges achieve stability. Perhaps a ratio of 0.6 provides stability, but a ratio of 1.2 or 3.1 does not. This story may help establish there was no expectation that, just because PMA and polyester is in the prior art, these two components together necessarily result in a stable composition in the context of your client’s invention.

Show data is consistent to the claims

Again, is the ratio and data a universal remedy to patentability? Possibly, but challenges remain. US examiners often scrutinise data and counter that data is not commensurate in scope with the claims.¹⁶ Thus, practitioners should ensure that supporting data is reasonably consistent with the claim scope in context of the ratio and any ranges of the components.

While some examiners argue supporting data must exactly match claim end-points, supporting data does not necessarily need such specificity. Data matching to the claims, of course, would be helpful, but developing such coverage of a data plan is often expensive and time consuming for the client. Establishing a discovered invention is commensurate with claims can also be achieved at the USPTO by (i) showing trends in the data, (ii) showing consistency between how end-points would have performed, or (iii) being selective on how many properties are evaluated.¹⁷

While every case is, of course, fact-specific based on the invention and prior art, US practitioners should consider these practice tips to better position chemical compositions for patentability.

Footnotes

1. Manual of patent examining procedure (MPEP) (9th ed Rev 8 Jan 2018) § 2131. *Verdegaal Bros v Union Oil Co of California*, 814 F.2d 628 (Fed Cir 1987).
2. MPEP § 2112. *Schering v Geneva Pharms* 339 F.3d 1373 (Fed Cir 2003).
3. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed Cir 1993) (“[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient.”) (quoting *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981)). *MEHL/Biophile Int’l Corp v Milgraum*, 192 F.3d 1362, 1365 (Fed Cir 1999) (“Occasional results are not inherent.”).
4. MPEP § 2144.05. *In re Aller*, 220 F.2d 454, 456 (CCPA 1955) (“[I]t is not inventive to discover the optimum or workable ranges by routine experimentation”).
5. MPEP § 2144.09.
6. 559 F.2d 618 (CCPA 1977).
7. *Id* at 620.
8. *Id* at 621.
9. 449 F.2d 1273 (CCPA 1974).
10. *Id* at 1274.
11. *Id*.
12. *In re Applied Materials, Inc*, 692 F.3d 1289, 1297 (Fed Cir 2012).
13. *In re Soni*, 54 F.3d 746 (Fed Cir 1995).
14. *Id* at 748.
15. *Applied Materials*, 692 F.3d at 1297 (quoting *Aller*, 220 F.2d at 456).
16. *In re Harris*, 409 F.3d 1339, 1344 (Fed Cir 2005) (“[e]ven assuming that the results were unexpected, Harris needed to show results covering the scope of the claimed range.”).
17. *In re Clemens*, 622 F.2d 1029, 1036 (CCPA 1980); *In re Lindner*, 457 F.2d 506, 508 (CCPA 1972); *In re Chupp*, 816 F.2d 643, 646 (Fed Cir 1987).

Author



Jeff Chelstrom is a patent attorney at Honigman with more than 15 years of experience assisting clients in preparation and prosecution, managing worldwide patent portfolios, and counseling on patentability and freedom-to-operate issues. He is well versed in polymers, chemistry, food science, adhesives, films, petroleum additives and lubricants.