Kluwer Patent Blog

Can Summer Heat Melt Polymer Compositions?

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Some Late Summer Thoughts about Molten Polymers and two Decisions by the German Federal Court of Justice

Now that the unusual heat of this summer in central Europe finally seems to have ended, it might be a good point in time to activate our cerebral bio-polymers again. So let us muse about the melting of polymers in general and consider a particular patent that gave the German Federal Court of Justice something to think about.

The patent at stake was European Patent 1 102 809, relating to a method for preparing a polymer foam (in German: *Polymerschaum*) comprising four steps and an article comprising the polymer foam obtainable according to this method. In a slightly simplified form, claim 1 comprised the following features:

> (a) providing a plurality of expandable polymeric microspheres and a molten polymer composition, each expandable polymeric microsphere including a polymer shell and a core material in the form of a gas, or a liquid, that expands upon heating;
> (b) melt mixing the molten polymer composition and the plurality of expandable polymeric microspheres, under process conditions, selected to form an expandable extrudable composition;
> (c) extruding the expandable extrudable composition through a die to form the polymer foam; and
> (d) at least partially expanding a plurality of the expandable polymeric microspheres before the expandable extrudable composition exits the die.

So, in simple terms, you add expandable polymeric microspheres to a polymer melt ("molten polymer composition"), mix the melt and the microspheres, then expand the microspheres under heat and extrude the resulting mass through a die to form the polymer foam.

The critical feature of this claim, which apparently gave the FCJ a bit of a headache, was this:

melt mixing the molten polymer composition and the plurality of expandable polymeric

microspheres

From a legal point of view, the relevant questions were whether this feature (a) had been originally disclosed in the application as filed and (b) whether it imparts novelty and inventive step to the process and the resulting article.

From a technical – and more fundamental – point of view, however, the question arose as to what is a "molten polymer composition", i.e. the interpretation of this feature.

The present case is perhaps unique in that the Federal Court of Justice issued two decisions on this question and made a complete U-turn in the second decision (Polymerschaum II; X ZR 101/13; GRUR 2015, 868) vis à vis the first one (Polymerschaum I; X ZR 117/11; GRUR 2012, 1124).

What happened?

The first decision by the FCJ was on appeal against a decision by the Federal Patent Court declaring the patent null and void for lack of novelty and inventive step over the four prior art references E01, E02, E04 and E05. The added matter question was left undecided. The Federal Court of Justice reversed the decision, maintained that the patent was novel and inventive over these references and remanded the case to the Federal Patent Court for a decision on added matter.

Quite apparently, the FCJ was not happy with the first instance court's interpretation of the feature "molten polymer composition" and was of the view that this term meant a completely molten polymer composition, i.e. that the temperature of the polymer mixture before adding the microspheres must be above its melting point. As a result, the FCJ found that none of the prior art references required a polymer composition that is (completely) molten prior to the mixing step and thought that choosing such a high temperature was also non-obvious.

But patentee's problem was that he had no literal basis for the feature melt mixing the molten polymer composition in the application as filed. Claim 23, from which this feature was derived, simply provided melt-mixing of "a polymer composition" and the microspheres and did not provide any indication as to the state of this polymer composition prior to mixing. The general description disclosed nothing beyond that. So the question arose as to whether the feature of a "molten polymer composition" was possibly inherent in the working examples of the original application. According to the FCJ, this might have been sufficient to decide added matter in favour of patentee (Polymerschaum I, margin no. 52):

"According to the established case law of the Senate, for affirming the original disclosure of the subject matter of a patent claim it is necessary that the skilled person was able to "directly and unambiguously" derive the technical teaching of the claim from the application as filed as a possible embodiment of the invention [cit. omitted] In this case law the Senate has also approved generalizations of originally disclosed working examples to avoid undue restrictions of the applicant when using the disclosed content. He has in any event deemed a "broad" claim unobjectionable from the point of view of added matter, if a working example presented itself as an embodiment of the more general teaching as circumscribed in the claim and if this

teaching in its claimed generality could already be taken from the application as filed as belonging to the invention as filed [cit. omitted] be it in the form of a claim formulated in the application as filed, or be it from the context of the application as filed as a whole. Such generalizations have been admitted especially when only one or only a few of the features of a working example that taken together, but also by themselves, promote the success of the invention, have been included in the claim [cit. omitted]. The generalization of a chemical compound has, however, also been approved (FCJ, judgment of 18 December 1975, X ZR 51/72, BGHZ 66, 17, 30 – Alkylendiamine I).”

However, the decision under appeal contained no findings of fact establishing that the temperature of the polymer composition was above its melting point. The FCJ therefore remitted the case.

And the case came back. The Federal Patent Court again declared the patent null and void for lack of patentability. It also held that the “molten polymer composition” represents added matter that should not be taken into consideration for the examination of patentability. So the Patentee appealed again and the FCJ had to take a second look at the patent and the interpretation of the critical feature “molten polymer composition”.

The Federal Patent Court stated – undisputed by the parties – that polymers and complex polymer compositions have no (sharp) melting point in the conventional sense, but have more or less broad softening or liquefaction ranges in which they can indeed be mixed and processed together with additives in an extruder. In these phases the polymers are not yet molten, but this is not necessary for the processing. It is not possible or at least nearly impossible to determine when a polymer composition is “molten”. Therefore, in the FPC’s view, this feature was not suitable to distinguish the claim from the state of the art.

The Federal Court of Justice disagreed with this legal approach, but accepted the factual underpinnings. In the FCJ’s view, a claim must be interpreted (construed) first before a decision can be made as to whether the (thus interpreted) claim is patentable and/or represents an extension of subject matter. Even if a feature is unclear or difficult to interpret (as in this case), it must be assigned a certain meaning by the court which is based on what this feature attempts to achieve when viewed by the skilled person. Thus, in the present case it had to be functionally determined when a polymer composition is “molten” within the meaning of the patent in suit.

Applying these principles before the entire record on file (including the Patent Court’s new decision and the numerous further expert opinions presented by both parties), the FCJ came to the conclusion that it had to revise and reverse its earlier interpretation. A “molten” polymer composition does not have to be “molten” in the sense that its temperature is beyond the (in any case, ill-defined) “melting point” of the polymer composition; it is sufficient if its viscosity is reduced to an extent that it can be processed in an extruder.
Applying this claim construction, the FCJ came to the conclusion that this feature did not represent added matter since the examples supported this construction (otherwise the mixing process would hardly have worked), whereas they would not have

supported an interpretation according to which the polymer mixture had to be completely molten. A party expert opinion was submitted demonstrating that the processing temperature in the examples was below the melting temperature of the polymers (defined in the sense of a loss factor tan delta of 1).
As a result of this U-turn in the claim interpretation, the FCJ ought to have overturned its earlier decision completely since this was based on the premise that prior art references did not disclose a (completely) molten polymer composition, however they did disclose softened polymer compositions that could be processed in an extruder, just like the patent in suit.

The problem with that is that decisions by the Federal Court of Justice between the same parties are legally binding on the issues they address. So the FCJ might have found it impossible, extremely difficult or at least highly unattractive to overturn its earlier positive verdict on patentability vis à vis E01, E02, E04 and E05. Fortunately, it did not have to since there were further references in the proceedings on which the FCJ previously had not (explicitly) given its opinion. In view of one of these references (E18) the patent was finally found to lack an inventive step, and thus the revocation of the patent was confirmed.

Viewed in a broader context, this pair of decisions may show the difficulties with which a court may be faced when confronted with the legal task of interpreting technical terms in a patent, particularly if the court (as the FCJ in this case) has no own technical expertise and is no longer supported by a technical expert, as it was under the old nullity procedure in Germany. In such a case, it is all the more important that the first instance decision by the Federal Patent Court, which has the required technical expertise on the bench, is carefully reasoned, particularly when it comes to the interpretation of the claims. The FCJ therefore placed great emphasis on a proper claim interpretation in the headnotes of both of its decisions. The take-home messages for the Federal Patent Court (and for the parties in nullity proceedings) are:
• The claims of the patent have to be interpreted solely on the basis of the patent specification, which may be supported by the usual meaning a term has in the art. However, in case of doubt, the meaning which can be derived from the patent prevails.
• The application as filed normally does not play a role in this interpretation exercise. If the claim, properly interpreted, contains subject-matter extending beyond the application as filed, it must be invalidated (Polymerschaum I, margin no. 28). Likewise, the interpretation should not depend on whether the claim, after proper interpretation, is patentable or not (Blasenfreie Gummibahn I, X ZR 7/00); therefore the prior art should also not be used for the interpretation of the claim, at least unless it is to establish the common meaning of a term in the art.
• The interpretation should be functional, i.e. based on the purpose which this feature has and which contribution it is supposed to make in the context of the claim as a whole (established Case Law, see e.g. Polymerschaum II, margin no. 26)
• A court may not satisfy itself by stating that a certain feature is “unclear” or “ill-defined”. The court has to determine what the feature means and thus assign an interpretation to it (Polymerschaum II, margin no. 28).

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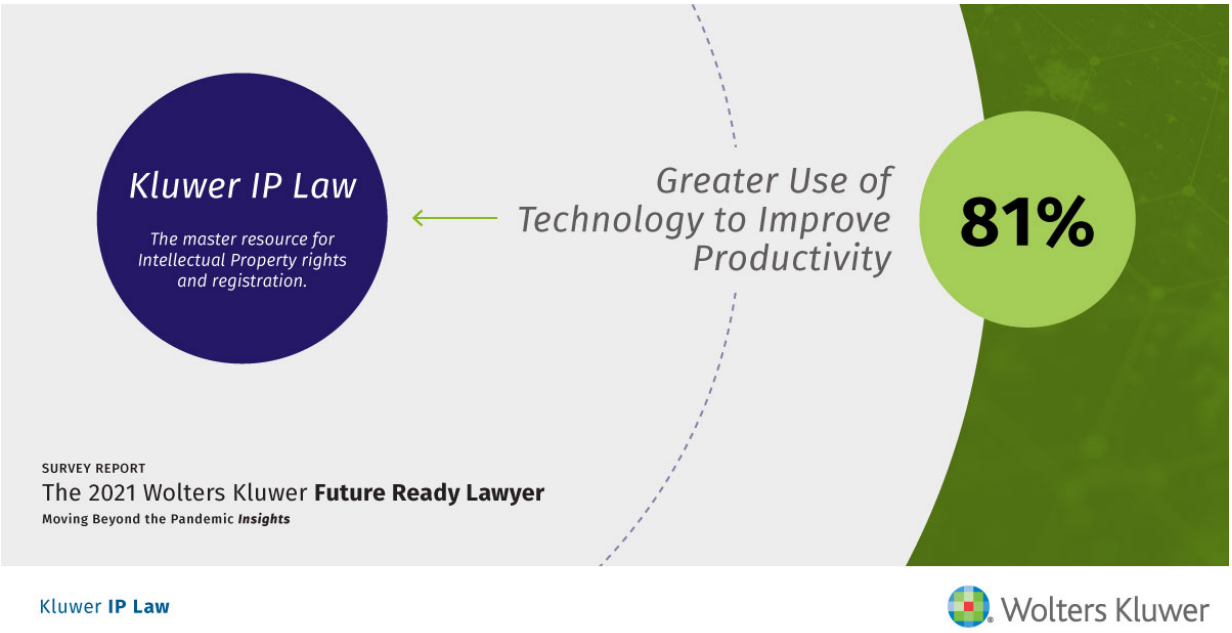

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